**Special Provisions**

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STSP’S Revised November 30, 2017

**SPECIAL PROVISIONS**

1. General.

Perform the work under this construction contract for Project 2788-00-71, Waukesha Bypass, Genesee Rd to Fiddlers Creek Dr, USH 18, Waukesha 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, 2018 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.

* 1. 20171130)

1. Scope of Work.

The work under this contract shall consist of removals, grading, hazardous material handling, roadway embankment, aggregate base, concrete pavement, HMA pavement, concrete curb and gutter, concrete sidewalk, Structures B-67-314/315, B-67-352/353, B‑67‑354/355, B-67-360/361, retaining walls R-67-129 and R-67-145, box culverts C‑67‑88 and C-67-91, storm sewer, storm water ponds, erosion control, pavement marking, traffic control, traffic signals, lighting, water main adjustments and relocations, sanitary sewer manhole adjustment and removals, and all incidental items necessary to complete the work as shown on the plans and included in the proposal and contract.

104-005 (20090901)

1. Partnering Charter.

*Add the following to standard spec 104.1:*

The department intends to encourage, support, and implement a partnering system on this contract with the full participation of the contractor and all subcontractors.

Partnering is a performance system designed to achieve an optimal relationship between all parties to a construction contract. Further, it is a method of conducting business in the construction profession without unnecessary, excessive, or disruptive external party involvement. The partnering system is structured to draw on the strengths of each participating organization to identify and achieve mutually profitable objectives.

The partnering system will consist of three main elements: preparation of a partnering charter, establishing and implementing a partnering effectiveness evaluation technique, and establishing and implementing an issue resolution procedure.

It is anticipated that within 14 calendar days of the issuance of a notice to proceed with construction, the department, its consultants, and the prime contractor on the project will participate, with their subcontractors, in a one day meeting to write a partnering charter.

The partnering charter is the basic manual for operating the partnering system. It includes, at a minimum, the mission of the project and the objectives of the project team. In addition, it outlines, in broad terms, the project evaluation methods to be used and the dispute resolution process to be applied to conflict issues as they arise on the job.

It is anticipated that the partnering charter meeting participants will establish and publish the partnering effectiveness evaluation method. This partnering evaluation method will set guidelines for periodically measuring project performance against the mission and objectives set out in the charter.

It is also anticipated that the partnering charter meeting participants will establish and publish the issue resolution procedure, designed to help resolve disputes quickly, satisfactorily, and as near as possible to the originating level of the dispute.

The contractor is required to participate in establishing these three elements of the partnering system in cooperation with the department and its consultants. Outside costs for effectuating the partnering effort will be mutually agreed to by both parties and will be shared equally.

The establishment of a partnership charter on this project will not change the legal relationship of the parties to the contract nor relieve either party from any of the terms of the contract.

stp-104-010 (20150630)

1. Mandatory Pre-Bid Meeting.

*Add the following to standard spec 102.3.1:*

Prospective bidders are required to attend a mandatory pre-bid meeting on June 19, 2018, at 10:00 AM at the Waukesha State Office Building on NW Barstow, Room 314.

No meeting minutes will be prepared. Issues discovered at the meeting will be handled by addendum.

102-010 (20150630)

1. Prosecution and Progress.

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

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

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

An Erosion Control Implementation Plan (ECIP) shall be submitted to the appropriate WisDOT office and the WDNR at least 14 days prior to the preconstruction meeting. Provide an amended ECIP prior to the winter shutdown and spring start-up.

Work within the wetlands and waterways shall not begin until the U.S. Army Corps of Engineers Section 404 Permit has been obtained.

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

Winter weather work, excavation of frozen ground, high ground water, dewatering during winter months, and mitigation efforts for high water table elevations shall not be considered adverse weather delays to construction. Cost for dewatering is considered incidental to construction.

Anticipate cold weather and early spring concrete paving and ancillary concrete work (curb, median barrier, etc). Plan to heat aggregates and water for mixes, and that the heating of the aggregate and water is considered incidental to those concrete items. There will be no adverse weather delay for cold weather construction.

When engaged in roadway cleaning operations, use equipment having vacuum or water spray mechanisms to eliminate the dispersion of particulate matter into the atmosphere. If vacuum equipment is employed, it must have suitable self-contained particulate collectors to prevent discharge from the collection bin into the atmosphere.

The contractor is advised that there may be multiple mobilizations for such items as erosion control, traffic control, signing items, temporary pavement markings and other incidental items related to the staging. The department will make no additional payment for said mobilizations.

**Interim and Final Completion of Work**

**Interim Completion of Stage 2B Work**

CTH D /Sunset Drive may be closed and detoured one time for a maximum of 67 calendar days in Stage 2B. If the contractor fails to complete the work necessary to reopen Sunset Drive during Stage 2B, to through traffic within 67 calendar days from the time closed, the department will assess the contractor $4,000 in interim liquidated damages for each calendar day that the roadway remains closed beyond 67 calendar days. An entire calendar day will be charged for any period of time within a calendar day that the road remains closed beyond 12:01 AM.

**Interim Completion of Stage 2C Work (Station 111+00 to 112+63 RT)**

Genesee Road may be closed and detoured one time for a maximum of 12 calendar days in Stage 2C to allow construction between Station 111+00 to Station 112+63. If the contractor fails to complete the work necessary to reopen Genesee Road during Stage 2C to through traffic within 12 days from the time closed, the department will assess the contractor $12,000 in interim liquidated damages for each calendar day that the roadway remains closed beyond 12 calendar days. An entire calendar day will be charged for any period of time within a calendar day that the road remains closed beyond 12:01 AM.

**Interim Completion of Stage 2D Work**

Genesee Road Station 31+11 to Station 50+00 and Saylesville Road, Station 7+50 to Station 112+35, may be closed and detoured one time for a maximum of 51 calendar days in Stage 2D. If the contractor fails to complete the work necessary to reopen eastbound Genesee Road and Saylesville Road during Stage 2D to through traffic within 51 calendar days from the time closed, the department will assess the contractor $12,000 in interim liquidated damages for each calendar day that these roadways remain closed beyond 51 calendar days. An entire calendar day will be charged for any period of time within a calendar day that the road remains closed beyond 12:01 AM.

**Interim Completion of Stage 2E Work**

Merrill Hills Road may be closed and detoured one time for a maximum of 35 calendar days in Stage 2E. If the contractor fails to complete the work necessary to reopen Merrill Hills Road during Stage 2E to through traffic within 35 calendar days, the department will assess the contractor $15,000 in interim liquidated damages for each calendar day that the roadway remains closed beyond 35 calendar days. An entire calendar day will be charged for any period of time within a calendar day that the road remains closed beyond 12:01 AM.

**Final Completion of Work**

If contract time expires prior to completing all work specified in the contract, additional liquidated damages will be affixed according to standard spec 108.11.

**Fish Spawning**

There shall be no instream disturbance of Pebble Creek or any tributary to Pebble Creek as a result of construction activity under or for this contract, from March 1 to June 15 both dates inclusive, in order to avoid adverse impacts upon the spawning of various fish species

Any change to this limitation will require submitting a written request by the contractor to the engineer, subsequent review and concurrence by the Department of Natural Resources in the request, and final approval by the engineer. The approval will include all conditions to the request as mutually agreed upon by WisDOT and DNR.

**Migratory Birds**

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

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

**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 have been identified within 150 feet of the project limits. 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).

To avoid adverse impacts upon the NLEBs, no Clearing is allowed between June 1 and July 31, both dates inclusive.

If the required Clearing is not completed by May 31, the department will suspend all clearing and associated work directly impacted by Clearing. The department will issue a notice to proceed with Clearing and associated work directly impacted by clearing after consulting with the United States Fish and Wildlife Service (USFWS).

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.

**Work Restrictions**

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

The contractor shall comply with all local ordinances which apply to work operations, including those pertaining to working during nighttime work hours. Any ordinance variance issued by the municipality or required permits shall be furnished to the engineer, by the contractor, in writing three working days before performing such work.

Equipment and material shall be parked or stored only at work sites approved by the engineer.

Provide the Wisconsin State Patrol, Waukesha County Highway Maintenance, Waukesha County Dispatch, the City of Waukesha Police Department, the City of Pewaukee Police Department, the City of Waukesha Fire Department, the City of Waukesha and the City of Pewaukee with a 24-hour emergency contact number for when maintenance is required.

Traffic shifts shown in a given stage may occur at different times during that stage depending on the controlling elements for a given traffic movement.

See the WE Energies Driveway article for requirements on the construction of the new driveway and removal of the existing driveways.

**Anticipated Schedule:**

Do not move to the next stage until all work in the current stage is completed or as approved by the engineer except that Stage 2A work can overlap other Stage 2 work except that the southern pavement areas needed for traffic control switches. Traffic control switches shall be completed during off peak hours.

**Stages 1 and 1A Construction (2018)**

* May begin substructure construction of westbound Structure B-67-315 over Pebble Creek on Genesee Road.
* Construct three areas of temporary widening on eastbound Genesee Road Station 33+90 to Station 38+15, Station 45+75 to Station 46+79 and Station 49+45 to Station 51+21 RT.
* Remove median islands and pave with temporary asphaltic pavement to accommodate temporary traffic layout at the Genesee/Saylesville intersection.
* Construct two median crossovers for use in Stage 2A traffic control, one on Les Paul Parkway Station 93+50 to Station 99+67 and another on Genesee Road Station 62+43 to Station 70+17.
* May begin substructure construction of land bridge Structures B-67-352/353 and B‑67‑360/361 on bypass between Genesee Road and Sunset Drive.
* May begin substructure construction of Structures B-67-354/355 on Waukesha Bypass over Pebble Creek.
* Roadway embankment work may be required to provide access to structures.
* Storm sewer and culvert installations may be required between Pebble Creek and MacArthur Road to maintain drainage patterns.
* Construct temporary widening on the east side of Merrill Hills Road Station 264+00 to Station 271+11 RT.
* Modify existing traffic control signals at the intersection of Genesee Road and Saylesville Road to accommodate traffic staging layouts at this intersection.

**Stage 2A Construction (2018)**

* Construct northbound Waukesha Bypass from Station 100+37 to Station 111+00.
* Construct off alignment sections of northbound and southbound Waukesha Bypass from Station 112+63 to approximately Station 153+53, gapping Sunset Drive; from Station 154+88 to Station 173+51, gapping the Wisconsin Southern at grade railroad crossing and the Glacial Drumlin Trail; from Station 176+85 to Station 219+00 just south of Kame Terrace. This work includes the Land Bridges Structures B‑67‑352/353, B‑67‑360/361, and B‑67‑354/355, and retaining wall R‑67‑145.
* Construct the storm sewer crossings of Merrill Hills Road at Station 240+69, 45’ LT and at Station 240+60, 25’ LT during evening hours. The pipe sizes are 15 inches and 36 inches respectively. Any night-time closing of Merrill Hills Road must be open to through traffic the following morning in this stage.
* Construct ponds at Station 200+00 and Station 215+00 LT.
* Construct southbound Waukesha Bypass from Station 222+25 to Station 240+75.
* Construct northbound Waukesha Bypass from Station 220+50 to Station 242+25.
* Construct southbound Waukesha Bypass from Station 243+50 to the end of project Station 273+75. This work includes constructing the western half of C‑67‑91 and constructing a bypass channel for a tributary to Pebble Creek. This Structure C-67-91 needs to be completed prior to the spring spawning season in 2019.
* Construct STH 59/CTH X intersection, gaps to remain. Install temporary traffic signals at this intersection.
* Construct westbound lanes of STH 59/Genesee Road including temporary widening abutting the newly constructed westbound lanes, Station 34+11 to Station 37+06 LT. This work also includes Structure B-67-315. This structure shall be completed prior to the traffic control shift for Stage 2D.
* Construct MacArthur Road and Merrill Hills Court.
* Construct west half of Madison Street, Station 49+20 to Station 50+00; and a portion of the southbound Waukesha Bypass.
* Construct the WE Energies driveways to Howell Avenue, approximately Station 266+00, LT.
* Construct temporary median crossover on the newly constructed Waukesha Bypass once concrete pavement is placed, Station 149+00 to Station 153+90. Do not construct the median curb and gutter Station 149+00 to Station 153+90 as this crossover will be between northbound and southbound median flange lines, with 5 inches of asphaltic surface temporary over 8-inch base aggregate dense 1 1/4‑inch.

**Winter 2018**

To allow embankments constructed in Stage 2A time for settlement, final concrete pavement shall all be constructed after March 1, 2019 unless approved by the engineer for the Waukesha Bypass except for the following station ranges which may be paved in 2018:

* Station 100+37 to Station 111+00
* Station 188+00 to Station 226+00
* Station 235+00 to Station 241+00

Structural work may continue through the winter.

The contractor shall not place asphalt between November 1 and April 1 without the written approval of the engineer. Additional payment will not be made for asphalt placed during extreme conditions without the written approval of the engineer.

Any roadway disturbed during the 2018 construction season shall have the base aggregate dense placed prior to winter.

An amendment to the Erosion Control Implementation Plan shall be required prior to winter shutdown and work resuming in the spring.

**Spring 2019**

**Stage 2A Continued (2019)**

* Construction of all of the Stage 2A concrete pavement on the Waukesha Bypass except for any concrete pavement within three station ranges mentioned above, which may have been completed in 2018.
* Completion of all other Stage 2A work items not finished.

**Stage 2B Construction (2018)**

* Construct CTH D, Sunset Drive. Roadway shall be closed and detoured.

**Stage 2C Construction (2019)**

* Construction of northbound Waukesha Bypass Station 111+00 to Station 112+63. CTH X/Genesee Road north of the STH 59 intersection shall be closed and detoured to allow this construction.

**Work Completed Prior To Stage 2C**

* Northbound Waukesha Bypass Station 100+37 to Station 111+00.
* Westbound Genesee Road Station 34+11 to Station 61+84 including Structure B‑67‑315.
* CTH D, Sunset Drive

**Stage 2D Construction (2019)**

* Construction of Eastbound STH 59/Genesee Road Station 34+11 to Station 50+00.
* Installation of temporary signals at the relocated intersection of Genesee Road and Les Paul Parkway.
* Construction of southbound Waukesha Bypass Station 100+37 to Station 112+20.
* Construction of CTH X/Saylesville Road Station 7+50 to Station 19+35. CTH X/Saylesville Road south of the STH 59 intersection shall be closed and detoured to allow this construction.

**Work Completed Prior To Stage** **2D**

* Northbound Waukesha Bypass Station 100+37 to Station 112+63.
* Westbound Genesee Road Station 34+11 to Station 61+84 including Structure B‑67‑315.
* CTH D, Sunset Drive

**Stage 2E Construction (2019)**

* Construction of the west half of C-67-88.
* Construct the roadway embankment and concrete pavement over C-67-88 for southbound Waukesha Bypass gap Station 173+00 to Station 177+25.
* Construct the storm sewer for the Glacial Drumlin Trail and Connections.
* Construct gap in southbound Waukesha Bypass at Kame Terrace Station 221+40 to Station 224+00 and the westbound lanes of Kame Terrace for Stage 2E-1 construction. Construct gap in southbound Waukesha Bypass at Kame Terrace Station 219+00 to Station 221+40 and the eastbound lanes of Kame Terrace for Stage 2E-2 construction.
* Construct gap in southbound Waukesha Bypass between Station 239+50 to Station 243+50 LT just north of Merrill Hills Court. The gap also includes the east side of Structure C-67-91.
* Construct Waukesha Bypass northbound Station 254+75 to Station 255+62 LT and the east half of Madison Street.
* Construct gaps in southbound Waukesha Bypass north of Madison Street between Station 256+50 to Station 260+15 LT and between Station 261+00 to Station 271+00 LT.

**Work Completed Prior To Stage 2E**

* All of southbound Waukesha Bypass except for five gaps listed above.
* Northbound Waukesha Bypass Station 100+37 to Station 173+00 and Station 177+25 to Station 216+00.
* All of Genesee Road except eastbound Station 51+63 to Station 61+84.
* All of Saylesville Road and Sunset Drive.
* MacArthur Drive except east intersection with Merrill Hills Road.
* The west half of Madison Street.

**Stage 3 Construction (2019)**

* Construction of northbound Waukesha Bypass Station 173+00 to Station 177+25, Station 214+50 to Station 222+25, between Station 241+50 to Station 254+80 and between Station 255+73 to Station 273+75.
* Finish construction of westbound lanes of STH 59/Genesee Road Station 51+60 to Station 62+00 including Structure B-67-314.
* Modify existing temporary signals at the intersection of Genesee Road and Les Paul parkway to lane configuration and opening the north leg.
* Remove crossover on Les Paul Parkway south of Station 100+37.
* Complete construction of Glacial Drumlin Trail and three connecting trails.
* Finish median islands of STH 59/Les Paul Parkway at Genesee Road.
* Construct four Merrill Hills Road cul-de-sacs.
* Complete reconstruction of the intersection of MacArthur Road and Merrill Hills Road in quadrants.
* Obliterate portions of Temporary Merrill Hills Road and restore Merrill Hills Road.
* Finish construction of C-67-91 (as necessary).
* Construction of Kisdon Hill Drive in three substages. Stage 3-1 constructs temporary widening on the south side of Kisdon Hills Drive, Stage 3‑2 constructs the westbound lanes and sidewalk of Kisdon Hill Drive and Stage 3‑3 constructs the eastbound lanes and sidewalk of Kisdon Hill Drive.

**Work Completed Prior To Stage** **3**

* All of southbound Waukesha Bypass.
* All of northbound Waukesha Bypass except Station 216+00 to Station 273+75.
* All of Genesee Road except eastbound Station 51+63 to Station 61+84.
* All of Saylesville Road and Sunset Drive.
* MacArthur Drive except east intersection with Merrill Hills Road.
* Kame Terrace, Merrill Hills Court and Madison Street.

**Stage 4 Construction (2019)**

* Complete construction of median islands, triangle islands and concrete sidewalk at Waukesha Bypass and Genesee Road intersection.
* Remove crossover south of Sunset Drive and finish median construction Station 149+00 to Station 153+90.
* Construct Kame Terrace pedestrian sidewalk, western curb at the median and restore median plantings (if necessary).
* Complete construction of median islands, triangle islands and concrete sidewalk at Waukesha Bypass and Madison Street intersection.
* Remove Waukesha Bypass crossover Station 276+38 to Station 277+88 and finish median concrete curb and gutter and concrete sidewalk.

**Work Completed Prior To Stage 4**

* All Waukesha Bypass work completed except minor median work and crossover removals.

**Definitions**

The following definitions shall apply to this contract:

**Off-Peak Hours:**

* 9:00 AM to 2:00 PM Monday, Tuesday, Wednesday, and Thursday
* 9:00 AM to 12:00 PM Friday
* 7:00 PM to 9:30 PM Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday
* 8:00 AM to 10:00 AM Saturday and Sunday

**Night-time Work Hours:**

* 9:30 PM Sunday, Monday, Tuesday, Wednesday, Thursday to 5:30 AM the following day
* 9:30 PM Friday, Saturday to 8:00 AM the following day

**Lane**:

A lane is defined as 11-feet wide except for the following location where 10-foot lanes were utilized:

* Kame Terrace
* Kisdon Hill Drive

1. Traffic.

**A General**

The construction traffic control shall be substantially accomplished as detailed in the Traffic Control Plans, and as described herein.

Traffic requirements under this contract shall be coordinated with other adjacent and concurrent department or local municipality projects. The contractor shall be responsible for implementing and coordinating with other contractors all traffic control as shown on the plans. Modifications to the traffic control plan may be required by the engineer to be safe and consistent with adjacent work by others.

**Winter**

The travel way and shoulders shall be clear of drums and barricades during the winter months. Only use drums and barricades to delineate closed lanes and maintain temporary connections as needed and as directed by the engineer. Drums and barricades in place during the winter shall be offset from the travel way or shoulder. In place winter drums and barricades shall be anchored with additional sand bags or other methods to ensure that they remain in place during winter maintenance operations.

Unless detailed in the plans, the contractor shall not begin or continue any work that closes traffic lanes outside the allowed time periods specified in the Prosecution and Progress article.

**Stage 1 Traffic**

* All existing roadways open to traffic.
* Short-term lane closures for eastbound Genesee Road temporary widening are allowed during off-peak hours.
* Lane closures for constructing crossovers on Les Paul Parkway and Genesee Road are allowed during off-peak hours.
* Lane closures at Genesee Road and Saylesville Road intersection to remove median and island curb and gutter and pave flush are allowed during off-peak hours.

**Stage 2A Traffic**

* CTH TT/Merrill Hills Road traffic maintained on existing alignment.
* CTH X, Saylesville Road has 2-way traffic on existing northbound lanes.
* STH 59/Genesee Road has 2-way traffic on existing eastbound lanes.
* CTH X, Saylesville Road and all other side roads to remain open.

**Stage 2B Traffic**

* CTH TT/Merrill Hills Road traffic remains on existing roadway north of STH 59.
* CTH D detoured.
* CTH X/Saylesville Road has 2-way traffic on northbound existing lanes.
* STH 59/Les Paul Parkway has 2-way traffic on southbound existing lanes.
* Genesee Road has 2-way traffic on eastbound existing lanes and widening.

**Stage 2C Traffic**

* Stage 2C traffic maintained the same as Stage 2B except:
* CTH X/Genesee Road closed and detoured between STH 59 and Ridge Road.

**Stage 2D Traffic**

* Stage 2D traffic the same as stage 2C except for a portion of CTH X/Genesee Road open to 2-way traffic.
* CTH X/Saylesville Road closed and detoured between Velma Drive and STH 59/Les Paul Parkway

**Stage 2E Traffic**

* CTH TT/Merrill Hills Road 2-way traffic maintained on existing lanes except closed and detoured between CTH D and Summit Avenue.
* CTH D traffic maintained on newly constructed lanes.
* STH 59 has 2-way traffic on northbound existing lanes.
* CTH X/Saylesville has 2-way traffic on eastbound existing lanes.
* Kame Terrace has 2-way traffic on westbound lanes in Stage 2E-1. Once that work is completed, Kame Terrace 2-way traffic is shift to the newly constructed eastbound lanes in Stage 2E-2.
* Madison Street has 2-way traffic on the west side of Madison Street while the east side of Madison Street is closed for reconstruction

**Stage 3 Traffic**

* Waukesha Bypass has 2-way traffic on northbound lanes south of CTH D/Sunset Drive.
* Waukesha Bypass has 2-way traffic on southbound Waukesha Bypass between Sunset Drive and north to the end of the project.
* Glacial Drumlin State Trail closed and detoured.
* STH 59/CTH X/Genesee Road has 2-way traffic on proposed westbound lanes.
* CTH X/Saylesville Road open to traffic.
* Sunset Drive, CTH D open to traffic.
* MacArthur Drive open to traffic except for quadrant closings at Merrill Hills Road intersection.
* Kame Terrace and Madison Street open to traffic
* Kisdon Hill drive is open to two-way traffic on the north side of the roadway while the south side widening is constructed in Stage 3-1. Kisdon Hill Drive is open to two-way traffic on eastbound temporary widening in Stage 3-2. Kisdon Hill Drive is open to two-way traffic on westbound temporary widening in Stage 3-3.

**Stage 4 Traffic**

* Waukesha Bypass northbound and southbound roadways open to traffic with a single outside lane in each direction.
* STH 59/CTH X/Genesee Road open to traffic.
* CTH X/Saylesville Road open to traffic.
* CTH D/Sunset Drive open to traffic.
* Kame Terrace is open to traffic.
* Madison Street is open to traffic.
* Kisdon Hill Drive is open to traffic.

**B Advance Notification**

**B.1 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 |
| Full 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 |
| System and service 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.

stp-108-057 (20161130)

**C Local Traffic Access**

**C.1 Requirements for Local Access Traffic Control**

Construct and maintain local access on routes of any section of closed roadway that will only carry local traffic conforming to the following criteria:

* Number of Lanes: One in each direction
* Lane Width: Minimum 10 foot width
* Driving Surface: Acceptable driving surfaces include asphaltic surface temporary, HMA pavement, or 6 inches of compacted base aggregate dense.
* Sections of roadways may require one way traffic for short durations requiring additional signs be placed for the one lane roadway.
* The roadway clear zone within a road closed to through traffic during construction shall be defined as 8 feet from the edge of the travel lane when work is not actively taking place. The clear zone adjacent to an open roadway shall be 18 feet from the edge of the travel lane.

Employ flaggers, signs, barricades, flexible tubular posts and bases, temporary precast concrete barrier, crash cushions temporary, and drums as necessary to safeguard and direct local traffic at all locations where construction operations may interfere with or restrict the smooth flow of traffic. Use drums and barricades to direct local traffic and delineate hazards such as open excavations, abrupt drop-offs, exposed manholes, etc. The use of such devices shall be incidental to the operation which creates the hazard. Drop-offs greater than 6 inches within 4 feet of an open traffic lane shall be graded or paved to maintain a 3:1 maximum slope. No additional payment shall be made for any labor or materials required to adhere to this restriction.

In roadway segments open to traffic or closed to through traffic Uneven Pavement signs shall be placed whenever there is a drop off greater than 2 inches between the layers of pavement or between pavement and aggregate shoulder at the end of the work day. No additional payment shall be made for any labor or materials required to adhere to this restriction.

Work inside of the roadway clear zone including excavation, embankment construction, storm sewer, and electrical work shall be allowed during off peak hours in a section open to through traffic.

Access to all commercial and private properties along Genesee Road, Saylesville Road, Merrill Hills Road, Merrill Hills Court, Kame Terrace, Kisdon Hill Drive shall be maintained at all times during the duration of this contract unless otherwise noted in the plans and except during construction of the driveways. This access shall be provided by the use of pavement gaps located at the time of construction by the engineer in the field. HES concrete shall be used to pave the gaps when specified by the engineer.

During driveway construction, no driveway approach shall be closed or removed from service without a five day notice given to the occupants of the premises to remove their vehicles prior to driveway removal or closing of the driveway approach access. The contractor shall replace the driveway as expeditiously as possible to minimize the inconvenience to the occupants whose driveway has been removed or closed.

**C.1.2 Traffic Control Devices**

Place roadway and sidewalk signing and roadway temporary or permanent pavement marking, and channelizing devices, in conformance with the plans and the Wisconsin Manual on Uniform Traffic Control Devices (MUTCD), latest edition. Traffic control devices shall be completely in place by the end of the working day of a traffic switch.

Use drums and barricades to direct local traffic through the work zones and to protect and delineate hazards such as open excavations, abrupt drop-offs and exposed manholes. Drop‑offs greater than 6 inches within 4 feet of an open traffic lane shall be graded or paved to maintain a 3:1 maximum slope.

**D Property Access**

Maintain access to properties along the project for local residents, businesses, and emergency vehicles. Access to all driveways and parking lots where alternative access is not available shall remain open at all times. Culvert pipe and driveway construction shall be staged to maintain driveway access. Keep business entrances open by partial driveway construction or by closing only one access at a time for properties with multiple driveways. Construct temporary commercial entrances including a crushed aggregate surface within 24 hours of removal. Combine temporary commercial entrances wherever practical to minimize the number of access locations.

Inform all adjacent property owners two working days prior to closing their access(es). Maintaining property access as described above is considered incidental to the Traffic Control bid item.

1. Holiday Work Restrictions.

Do not perform work on, nor haul materials of any kind along or across any portion of the highway carrying USH 18 (Waukesha Bypass), STH 59, CTH X, CTH D, Merrill Hills Road / CTH TT and the detour route 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, August 31, 2018 to 6:00 AM Tuesday, September 4, 2018 for Labor Day;
* From noon Wednesday, November 21, 2018 to 6:00 AM Monday, November 26, 2018 for Thanksgiving;
* From noon Friday, December 21, 2018 to 6:00 AM Wednesday, December 26, 2018 for Christmas;
* From noon Friday, May 24, 2019 to 6:00 AM Tuesday, May 28, 2019 for Memorial Day;
* From noon Wednesday, July 3, 2019 to 6:00 AM Friday, July 5, 2019 for Independence Day;
* From noon Friday, August 30, 2019 to 6:00 AM Tuesday, September 3, 2019 for Labor Day.

107-005 (20050502)

1. Utilities.

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

107-065 (20080501)

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

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

Utility companies will be performing utility work and adjustments within the limits and during the life of this project. The contractor shall cooperate and coordinate construction activities with these organizations.

If a conflict with discontinued utility facilities is encountered, contact the appropriate utility owner/representative for instructions on proper removal and disposal of said facility.

Some utility work described below is dependent on prior work being performed by the contractor at a specific site. In such situations, provide the engineer and the affected utility a good faith notice of when the utility is to start work at the site. Provide this notice 14 to 16 calendar days in advance of when the prior work will be completed and the site will be available to the utility. Follow-up with a confirmation notice to the engineer and the utility not less than 3 working days before the site will be ready for the utility to begin its work or as otherwise noted in this special provision.

Unless otherwise specified by the contract or authorized by the engineer, the existing utilities are to remain in service.

Contact the appropriate utility owner/representative prior to disturbing any discontinued facilities. Verify that utilities have been properly discontinued in place and do not necessitate any special requirements by the utility. The contractor shall not assume that unmarked facilities have been discontinued. At no time is it acceptable to push, pull, cut or drill an unmarked facility without explicit consent from the utility.

**AT&T Corporation** hasthe following facilities in the project area:

Underground facilities are located along the east side of Saylesville Road (CTH X) and south side of STH 59, east of CTH X, at the proposed realignment. There will be no conflicts with the proposed roadway work and utilities are to remain in place.

The construction field contact for AT&T Corporation is:

AT&T Legacy/long distance

Mr. William Koening

128 W. Sunset Avenue

Appleton, WI 54911

(608) 628-0575

[wekoening@att.net](mailto:wekoening@att.net)

**AT&T Wisconsin** has underground and joint aerial facilities in the project corridor that require relocation or adjustment. AT&T Wisconsin will start their relocations in early April 2018. Some of the relocations, as noted below, are dependent upon the other underbuilds completing their respective relocation work. AT&T Wisconsin will be performing their relocations prior to and during construction.

**AT&T Wisconsin** hasthe following facilities in the project area:

**Proposed Waukesha Bypass / CTH TT/**

|  |  |  |
| --- | --- | --- |
| **Station(s)** | **Work Proposed** | **Description of Work** |
| 216+75 LT/RT | Buried cable crossing CTH TT | Installation of pedestal at 216+75 RT will connect to existing pedestal on west side of proposed Waukesha Bypass. |
| 216+75 LT/RT to 230+00 LT/RT | Disconnect Aerial(s) | Any aerials will be disconnected from service |
| 237+50 | Buried cable crossing CTH TT | New buried cable to service Merrill Hills Court and existing line to remain in place |
| 237+50 LT to 255+89 LT | Transfer of line service from underground to aerial | Buried cable to be discontinued in place on west side of existing CTH TT from 237+50 to 250+40, crossing at Station 250+40 and extending to 255+90 along the east side of CTH TT. Service to be established on new poles installed by WE Energies on west side of roadway |
| 237+50 LT to 250+50 LT | Remove aerial line | Remove aerial line along east side of existing. |
| 250+50  250+50 RT to 254+85 RT | Buried cable crossing CTH TT | Underground line crossing perpendicular to roadway with line then extending northeast to Madison Street at Station 52+50 |
| 255+86 | Aerial crossing | New aerial crossing CTH TT just north of Madison Street intersection |
| 255+89 LT to 264+15 LT | Transfer of line service from underground to aerial | Buried cable to be discontinued in place on east side of CTH TT and service to be established on new poles installed by WE Energies on west side of roadway |
| 264+15 LT/RT | Aerial crossing | New aerial crossing CTH TT just north of Kisdon Hill Drive intersection |

**Madison Street**

|  |  |  |
| --- | --- | --- |
| 49+00 | Aerial crossing Madison Street east of CTH TT intersection | Continuation of service being transferred from buried underground on the east side of CTH TT to new poles installed by WE Energies on west side of roadway. Existing line to be discontinued in place. |
| 47+00 LT to 49+00 LT | Relocate underground line | New underground line to be offset of existing line. Existing line to be discontinued in place on north side of Madison Street. |
| Dairy Avenue intersection to 49+00 RT | Relocate underground line | New underground line to be offset of existing line. Existing line to be discontinued in place on south side of Madison Street. |
| 52+50 RT to east beyond construction limits | Relocate underground line | New underground line to be offset of existing line. Existing line to be discontinued in place on south side of Madison Street. |

AT&T Wisconsin estimates that they will require 6 weeks of construction time for the work outlined above. Their work will commence upon Charter, Windstream, MWFN and City of Waukesha Cable completing their relocations.

**Genesee Road / STH 59/Les Paul Parkway**

|  |  |  |
| --- | --- | --- |
| 32+40 LT/RT | Buried cable crossing Genesee Road | Underground line crossing perpendicular to roadway with line then extending east on south side of Genesee Road |
| 32+40 RT to 41+75 RT | Buried cable | Buried underground line extending east on south side of Genesee Road, tying into cable that came from east leg of Genesee Road at Station 41+75 |
| 34+80 LT to 47+00 LT | Aerial line and buried cable | Aerial line will commence at Station 34+80 RT, extending east to Station 39+00 RT; buried cable will tie in from pole and continue east to new pedestal at Station 47+00 LT. Existing underground line from 32+50 to 52+00 along the west side of Genesee Rd to be discontinued in place. |
| 41+75 RT to 14+00 RT Saylesville R/L to 106+00 LT Les Paul R/L | Buried cable and crossing Saylesville Road | Line to be placed easterly along south right-of-way of of Genesee Road, then turn south along west right-of-way line of Saylesville Road; line will cross perpendicularly under proposed Saylesville Road at 14+00; line will be placed along east right-of-way line of Saylesville Road to sta 106+00 LT |
| 106+00 RT to 107+25 RT | Buried cable and crossing Les Paul Parkway | Underground line crossing roadway. |
| 107+25 RT to 110+00 RT | Buried cable | Underground line placed along north side of Les Paul Parkway right-of-way. |
| 52+00 RT to 59+50 RT | Aerial line | New buried line to exit ground and continue on poles, supplanting buried discontinued cable remaining in place on west side of road |
| 59+50 RT to 61+75 RT | Relocate underground line | New underground line to be placed east of Genesee Road, existing buried cable on west side of road to be discontinued in place |
| 61+75 LT/RT | Buried cable crossing Genesee Road | Underground line crossing perpendicular to roadway then extending south on east side of Genesee Road |
| 7+25 LT to 9+75 LT Saylesville R/L | Buried cable to be lowered in place | Buried cable to be lowered in place from 7+25 LT to 9+75 LT |

AT&T Wisconsin estimates that they will require 5 weeks of construction time for the work outlined above at the STH 59 intersection. Work is anticipated to start late May 2018.

**Sunset Drive / CTH D**

|  |  |  |
| --- | --- | --- |
| 43+00 LT to  47+80 LT | Relocate underground line | New underground line to be offset of existing. Existing line to be discontinued in place on north side of existing Sunset Dr. |
| 47+80 LT/RT | Buried cable crossing Sunset Drive | Underground line crossing perpendicular to roadway at Station 47+80 |
| 47+80 RT to  61+50 RT | Relocate underground line | New underground line to be offset of existing. Existing line to be discontinued in place on south side of existing Sunset Dr. |
| 61+50 RT to 65+50 RT | Relocate aerial line | Aerial line to tie into existing at Station 65+50 RT |

**MacArthur Road / Merrill Hills Road Intersection**

|  |  |  |
| --- | --- | --- |
| 76+30 LT to  77+75 LT | Transfer of line service from underground to aerial | Aerial line to replace buried service existing along west side of Merrill Hills Rd right-of-way. Existing line to be discontinued in place. |
| 56+50 RT to  58+50 RT | Relocate underground line | New line to cross at Station 76+30 of Merrill Hills Road. Existing line to be discontinued in place. |
| 76+90 RT to  78+50 RT | Relocate underground line | Buried line to cross MacArthur Road at Station 57+10. Existing line to be discontinued in place. |

AT&T Wisconsin estimates that they will require 4 weeks of construction time for the work outlined above at Sunset Drive and MacArthur Roads. Work is anticipated to start early July 2018.

The construction field contact for AT&T Wisconsin is:

Mr. Christopher Duncan

2005 Pewaukee Rd.

Waukesha, WI 53188

Work: (262) 896-7678

Cell: (414) 491-4810

[cd8946@att.com](mailto:cd8946@att.com)

**City of Waukesha Sanitary and Storm Sewer** has underground facilities within the project limits and work is included as part of the proposed project improvements.

Contact Jonathan Schapekahm with the City of Waukesha at (262) 524-3584, [jschapekahm@waukesha-wi.us](mailto:jschapekahm@waukesha-wi.us) five business days prior to starting any work and to arrange for an inspector to be on site at the time work is completed.

Televise the sanitary sewer and place internal manhole sealing system as called for in the plans and special provisions.

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| Station 254+45, 26’ RT  Station 254+81, 4’ LT | Contractor to discontinue sanitary force main manholes as shown on the plans |
| Station 268+12, 66’ LT  Station 269+34, 66’ LT  Station 269+65, 36’ RT  Station 270+25, 36’ RT | Contractor to adjust/reconstruct sanitary sewer manholes as shown on the plans |
| Station 268+12, 66’ LT to Station 269+34, 66’ LT  Station 268+34, 66’ LT to Station 269+65, 36’ RT  Station 269+65, 66’ LT to Station 270+25, 36’ RT | Contractor will televise sanitary lines between the three listed stations and offsets |
| Station 270+25, 36’ RT | Contractor will televise sanitary lateral line |

The construction field contact for City of Waukesha Public Works (Sanitary) is:

Mr. Jonathan Schapekahm

130 Delafield Street

Waukesha, WI 53188

(262) 524-3584

[jschapekahm@waukesha-wi.us](mailto:jschapekahm@waukesha-wi.us)

**City of Waukesha Public Works (Fiber Optics)** has overhead and underground facilities within the project limits. Generally the cable is overhead located on We Energies poles.

The City of Waukesha has aerial cable on WE Energies poles on the east side of Genesee Road from Station 34+11 RT to Station 42+35 RT. The aerial facility is currently attached to the WE Energies pole line that continues southeast crossing Saylesville Road at Station 16+40. This existing aerial cable crossing Saylesville Road at Station 16+40 will now cross at approximately Station 13+40, connecting to new WE Energies pole at Station 12+90, 80 feet RT. Aerial service will then reconnect to pole at Station 15+90, 370’ RT. City of Waukesha estimates that they will require 2 weeks of construction time for the work outlined above. Their work will commence upon TCA and Charter completing their relocations.

The City of Waukesha has aerial cable on WE Energies poles on the east side of Saylesville Road from Station 7+50 RT to Station 15+88, 339 feet RT. Starting at the WE Energies pole at Station 15+88, 339 feet RT the fiber optic cable is in underground duct to the north and crosses Les Paul Parkway at approximately Station 106+88. The underground fiber optic enters a vault on the east side of Les Paul Parkway at Station 107+07, 80 feet RT. These will remain in place without adjustment.

The underground fiber optic line continues northwest along the east side of Les Paul Parkway until the intersection with Genesee Road where the duct continues north along the east side of Genesee Road. The end of this underground fiber optics line is a WE Energies pole near Pebble Creek at approximately Station 55+21, 101 feet RT. These will remain in place without adjustment.

The City of Waukesha has aerial cable on WE Energies poles from this pole at Station 55+21 on the east side of Genesee Road continuing through the project limits at Station 61+84. These will remain in place without adjustment.

Except for the crossing of Les Paul Parkway the majority of this underground fiber optic duct is located beyond the exterior limits of the construction work. The crossing of Les Paul Parkway will be ten feet higher after roadway construction is finished. This underground facility will remain in place without adjustment.

The City of Waukesha will be placing aerial cable on new We Energies poles from Station 253+99, 98 feet LT to Station 264+15, 79 feet LT. There will be 2 aerial crossings of the Bypass at Stations 264+15 and 253+99. There will be 2 aerial crossings of Madison Street at Stations 49+05 and 51+60. Along the north side of Madison Street, aerial line will be relocated to the new We Energies poles. City of Waukesha estimates that they will require 3 weeks of construction time for the work outlined above. Their work will commence upon Charter, Windstream and MWFN completing their relocations.

The construction field contact for the City of Waukeshais:

Mr. Jeffrey Hernke

130 Delafield St.

Waukesha, WI 53188-3616

(262) 524-3592

[jhernke@waukesha-wi.gov](mailto:jhernke@waukesha-wi.gov)

**City of Waukesha Public Works (Street Lighting)**

The City of Waukesha will be responsible for inspection and approval of all City of Waukesha street lighting work. New lighting will be completed as a part of this project.

An existing light pole is located at the southeast corner of Kisdon Hill Drive and CTH TT than will need to be relocated.

Lighting work will begin with single luminaires installed in the southeast and northeast quadrant and twin luminaries installed at the median openings of the Waukesha Bypass and Kisdon Hill Drive. Conduit will extend in the median and connecting to the two twin luminaries installed under Project 2788-00-70/72 at the median opening of the Fiddlers Creek Drive intersection.

Contact Jeff Hernke with the City of Waukesha at (262) 524-3592, [jhernke@ci.waukesha.wi.us](mailto:jhernke@ci.waukesha.wi.us) five business days prior to performing the work to arrange for an inspector to be present at the time the work is completed.

**Level 3 Communications (Long Haul Fiber Optic Cable)** has an underground facility which runs parallel with the current Glacial Drumlin Trail. Due to this fiber optic cable being part of the L3 long haul network, it is imperative that this fiber does not take a hard cut/outage, nor add any additional and unnecessary splice enclosures. Level 3 will be performing their relocations during construction, prior to the construction of the Glacial Drumlin Trail box culvert.

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| Station 48+35 10' LT to approximately Station 51+15 14' LT along and beneath the north side of the Glacial Drumlin Trail. | Replace the fiber cable and conduit from an existing L3 hand hole to an existing L3 hand hole. Once the proposed L3 fiber cable is spliced in, the existing L3 fiber cable will be removed and the existing conduit will be discontinued. |

The construction field contacts for Level 3 Communicationsare:

Mr. Brahim Gaddour

3235 Intertech Dr., Suite 600

Brookfield, WI 53045

Work: (414) 908-1027

Cell: (414) 704-1026

[brahim.gaddour@level3.com](mailto:relo@level3.com)

Network Relocations

Mr. Masood Zeerak

1025 Eldorado Blvd.

Broomfield, CO 80021

[level3.networkrelocations@level3.com](mailto:level3.networkrelocations@level3.com)

**Midwest Fiber Network (communication)** has aerial facilities attached to We Energies poles from Station 253+73, 110’ RT to Station 264+27, 95’ RT. Midwest Fiber Network will build new strand on the new We Energies poles along the west side of the Bypass and lash new fiber to the strand. The line will cross the Bypass at Stations 264+15 and 253+99. It will cross Madison Street at Stations 49+00 and 51+55, connecting to newly constructed We Energies poles along the north side of Madison Street east to Station 54+25 LT. The aerial line will be relocated to 14 new We Energies poles for this project. This work is to be done prior to and during roadway construction.

MWFN estimates that they will require 4 weeks of construction time for the work outlined above. Their work will commence upon Charter, and Windstream completing their relocations.

The construction field contact for Midwest Fiber Networkis:

Mr. Cory Schmuki

OSP Engineer

6070 N. Flint Road

Glendale, WI 53209-3714

(414) 459-3554

[cschmuki@midwestfibernetworks.com](mailto:cschmuki@midwestfibernetworks.com)

**Sprint Fiber (communication)** has an existing Fiber currently along the south side of the Glacial Drumlin State Trail.

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| South side of the Glacial Drumlin State Trail. This facility will be lowered to avoid EBS and marsh excavation. | Relocation of this fiber line by directional boring approximately 2,475 linear feet at a lower elevation to clear construction. The fiber line crosses the Waukesha bypass reference line at Station 175+25. The fiber line will be placed 20 feet below the proposed roadway. Work will be done prior to roadway construction. |

Sprint will be performing their relocations during construction, prior to the construction of the Glacial Drumlin Trail box culvert.

The construction field contact for Sprint Fiberis:

Mr. Jim Burton

Facility Engineering/OPS-East

5600 N. River Rd. Suite 200

Rosemont, IL 60018

Cell: (708) 955-6659

[james.m.burton@sprint.com](mailto:james.m.burton@sprint.com)

Mr. Gerry A. Crain

Facility Engineer II

5600 N. River Rd. Suite 200

Rosemont, IL 60018

Cell: (847) 445-1869

[gerry.a.crain@sprint.com](mailto:gerry.a.crain@sprint.com)

**Teleport Communication America –TCA (communication)** has aerial facilities that will be relocated in conjunction with We Energies pole relocations. Work is to begin as soon as WE Energies sets their new poles. It is anticipated that TCA will require 14 working days to complete their construction. Locations of the relocations are listed below:

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| Aerial lines in conflict with proposed Waukesha Bypass, will need to be relocated to new We Energies poles. | **STH 59 / Genesee Rd**  Station 32+34, 60 feet LT to Station 41+15, 185 feet RT, crossing Genesee Rd at Station 34+70.  **CTH X / Saylesville Rd**  Station 12+90, 80 feet RT  Station 13+91, 78 feet LT  Station 15+90, 370 feet RT  Station 17+33, 132 feet LT  **STH 59 / Les Paul Pkwy**  Station 106+04, 142 feet LT  Station 106+00, 132 feet RT to Station 109+05, 138 feet RT |

The construction field contact for Teleport Communication Americais:

Ms. Jennifer Navarro

Northwind Technical Services

6070 N Flint Rd

Glendale WI, 53209

Work: (414) 459-3564

Cell: (414) 651-0036

[j.navarro@northwindtech.com](mailto:j.navarro@northwindtech.com)

**Charter (communication)** has underground and overhead facilities within the project limits. Some of Spectrum/TWC/Charter’s facilities are located on We Energies poles throughout the project limits. Relocations and adjustments of Spectrum facilities are anticipated to begin prior to the start of this roadway project.

Contact Pete Kruzela by phone at (414) 908-1339 a minimum of ten working days prior to working in the vicinity of Spectrum facilities.

At no time should the facility be used as a brace to support equipment or sheeting/shoring materials.

The following aerial lines have been identified for relocation:

**Waukesha Bypass**

* Relocate aerial line crossing from Station 106+00 to Station 106+80 onto new We Energies poles.
* Station 133+00 to Station 135+00, aerial line to be removed.
* Station 151+70, LT, aerial line and pedestal to be removed.
* Station 176+54 LT/RT, replace aerial crossing onto new We Energies poles.
* Station 212+39, 39, 126’ RT to Station 212+32, 101 feet LT, new aerial crossing onto new We Energies poles.
* Station 212+32, 101’ LT to Station 228+27, 151 feet LT remove existing aerial line on east side of Merrill Hills Road and install new aerial line on new We Energies poles on west side of the Bypass.
* Station 220+68, LT underground cable from Kame Terrace connect to new We Energies pole at Station 220+46, 120 feet LT.
* Station 224+00, install underground cable from new We Energies pole at Station 223+68, 150 feet LT to new pedestal at 224+46, 188 feet LT.
* Station 228+27, 151 feet LT to 237+00, 100 feet LT replace aerial on existing We Energies pole.
* Station 237+00, 100 feet LT install new underground line from new We Energies pole to new pedestal at 236+58, 106 feet LT.
* Station 237+00, 100 feet LT to 264+14, 100 feet LT – remove existing aerial line on east side of Merrill Hills Road and install new aerial line on new We Energies poles on west side of the Bypass.
* Station 243+11, 129 feet LT to Station 243+45, 100 feet RT new aerial line crossing on We Energies poles.
* Station 243+45, 100 feet RT to 245+00, 102 feet RT, install joint underground line cable with We Energies. At 245+00, 150 feet RT, expose and relay existing underground line to new pedestal at 102 feet RT.
* Station 248+76 RT to 252+21, 152 feet RT, replace underground line cable.
* Station 253+99, 98 feet LT to Station 254+01, 151 feet RT new aerial line crossing on We Energies poles.
* Station 255+60 to 257+07, 92 feet RT new underground line 15 feet from right‑of‑way.
* Station 264+14, 100 feet LT to Station 264+27, 90 feet RT new aerial line crossing on We Energies poles.

**Genesee Road / STH 59**

* Station 34+65, no conflict with existing underground crossing. Approximately 4 foot vertical clearance.
* Station 34+71, 52.5 feet LT, adjust exiting pedestal to proposed grade and install new power supply at/near Station 34+70, 60 feet LT.
* Power supply pedestal at Station 35+35, 49 feet LT to be removed.

**Saylesville Road**

* Relocate aerial line crossing from Station 17+33, 132 feet LT to 12+90, 80 feet RT.

**Merrill Hills Road at WI & Southern Railroad Crossing**

* Existing aerial line crossing. Transfer existing risers to new poles north and south side of railroad crossing.

**Merrill Hills Road at MacArthur Road**

* Station 56+38, 53 feet LT to Station 57+28, 24 feet RT relocate aerial line to new We Energies poles.

**Madison Street**

* Station 51+60 aerial crossing of Madison St. on new We Energies poles.
* Station 51+60 to 54+85 RT, relocate aerial to new We Energies poles.
* Station 47+45 to Station 49+00 RT, joint underground with We Energies, crossing Madison St at Station 47+45.

Charter estimates that they will require 10 weeks of construction time for the work outlined above. Their work will commence upon We Energies completing their relocations.

The construction field contact for Charteris:

Mr. Pete Kruzela

Utility Coordinator

1320 N. Dr. Martin Luther King Jr. Drive

Milwaukee, WI 53212

(414) 908-1339

[pete.kruzela@charter.com](mailto:pete.kruzela@charter.com)

Wis.engineering@charter.com

**Waukesha Water Utility (Water)** - As part of this construction project, various components at various locations of water main work will need to be completed.

The work will consist of the following items: 16-Inch water main relocation, 12-Inch water main relocation, 8-Inch water main relocation, five hydrant relocations, four 20-Inch valve adjustments, four 16-Inch valve adjustments, one 12-Inch valve adjustment, two 8-Inch valve adjustments, five 6-Inch valve adjustments and installation of water main insulation.

Contractor shall coordinate work with the Waukesha Water Utility.

Existing valves and hydrants will be operated only by Waukesha Water Utility personnel or in the presence of the inspector, as authorized by Waukesha Water Utility.

All work associated with connecting the offset water main relocations to the old water main shall be coordinated with the Waukesha Water Utility as set forth in the plans and special provisions. The Waukesha Water Utility will assist in turning the existing valves to isolate these areas for the installation of the water main offsets.

Water mains will not be allowed to be shut down before 8:00 AM. Contractor is responsible to notify all customers when their water will be shut off and in case of an emergency. The notification should be done at least 24 hours prior to shut down whenever possible. No extra costs or change orders will be allowed for down time associated with the Waukesha Water Utility crews turning the water off or on.

Following construction but before the surface course, the Water Utility must be contacted to inspect their facilities on the project. Any damage found to be caused by the contractor shall be repaired by the contractor in a timely manner at the contractor’s expense. All Water Utility facilities and other street structures must be exposed before the pavement is placed.

Contractor shall identify proposed grade changes that affect valve boxes or curb stops and notify Waukesha Water Utility providing at least 24 hour notice. Provide 72-hour notice if adjustment by the Waukesha Water Utility is necessary.

A schedule showing tentative dates for water main construction shall be provided to the water utility at least 2 weeks prior to beginning construction. Contractor shall provide 72 hours’ notice of the anticipated need for inspection services. Contact Chris Walter with the Waukesha Water Utility at (262) 409-4432, [cwalter@waukeshacounty.gov](mailto:cwalter@waukeshacounty.gov) to arrange for an inspector to be present at the time the work is completed. No work shall be undertaken without a Waukesha Water Utility inspector being on site without the permission of the owner. Payments may be denied, or removal of work may be ordered, for work accomplished without an inspector present or without the approval of the owner. Verify water main size, material, and elevation prior to proceeding with relocation work.

The construction field contact for Waukesha Water utilityis:

Mr. Chris Walter

115 Delafield St.

Waukesha, WI 53188

(262) 409-4432

[cwalter@waukeshacounty.gov](mailto:cwalter@waukeshacounty.gov)

**We Energies – Electric –** We Energies has both aerial and underground electric facilities throughout the entire length of the project. These facilities will be relocated prior to construction.

Relocations and adjustments of We Energies facilities will be constructed per the following work requests: 3948247, 3955536, 3955538, 3955540, 3955541, 3955542, and 3955543. Highway stationing has been used where possible to locate new facilities.

New We Energies facilities installed in easement on private property may not be included in the following list, unless otherwise stated.

It is expected that contractors will work safely around any facilities left within the work zone. If plans change such that facilities become in conflict, it is expected that you will work with We Energies to resolve said conflict.

We Energies work is expected to begin in April 2018. Work is anticipated to take a total of 100 working days. All work is to be done prior to and during roadway construction. We Energies has provided a schedule of anticipated dates of completion of their work. The dates assume no lost work days due to inclement weather, wet spring work or emergency power restoration due to storms. Pole removals are dependent upon the removal of communication companies’ facilities (underbuilds) from We Energies poles. Upon relocations by the underbuilds, We Energies will remove the poles.

We Energies – Electric plans to perform the following work, supplanted with the respective tables in the work plans:

**Contractor must call We Energies 24 hour Dispatch lines to arrange for verification.**

**We Energies Electric Dispatch, (800) 662-4797**

**We Energies Gas Dispatch, (800) 261-5325**

**Overhead (#3948247)**

**CTH TT**

* Relocate aerial power line across CTH TT at Station 264+27, 90 feet RT to Station 264+11, 210 feet LT.
* Relocate existing aerial power lines from Station 238+82, 121 feet LT to Station 264+31, 45 feet RT on east side of existing roadway to west side of proposed Waukesha Bypass.
* Place aerial power line across CTH TT at Station 260+96.
* Place aerial power line across CTH TT at Station 255+89.
* Place aerial power line across CTH TT at Station 253+99.
* Place aerial power line across Madison Street at Station 51+60.
* Place aerial power line across CTH TT at Station 246+72.
* Place aerial power line across CTH TT at Station 243+25.
* Service to be disconnected due to demolition for W270 S 1990 Merrill Hills Road and pole to be removed at Station 239+57, 36 feet RT.

**Overhead (#3955536)**

**CTH TT**

* Relocate existing aerial power lines from Station 82+70 (R/L of Merrill Hills Road), 25 feet RT to Station 228+27, 151 feet LT on east side of existing roadway to west side of proposed Waukesha Bypass.
* Place aerial power line across CTH TT at Station 237+00
* Relocate existing pole from Station 234+75, 138 feet LT to Station 235+25, 130 feet LT. Relocate existing aerial power from Station 237+00 to Station 238+82, 121 feet LT on east side of existing roadway to new poles on west side of proposed Waukesha Bypass.

**Overhead (#3955543)**

**Madison Street/CTH TT**

* Relocate aerial power lines to underground from Station 47+50, 26 feet LT to Station 52+50, 48 feet LT.
* Place aerial power lines from Station 51+60, 48, LT to Station 55+93, 28 feet RT.

**Underground (#3948247)**

**CTH TT**

* Trench cable from Station 252+60, 141 feet RT to existing pedestal at Station 252+27 146 feet RT. (#3948247)
* Bore electrical cable from Station 243+45, 100 feet RT to Station 245+20, 111 feet RT. New cable to be spliced and tied in existing underground cable. Cable from Station 245+01, 67 feet RT to splice point to be discontinued.

**Underground (#3955536)**

**CTH TT**

* Trench cable from Station 215+57, 117 feet LT to splice point of existing underground cable at Station 215+64, 118 feet LT.
* Trench cable from Station 216+85, 119 feet LT to splice point of existing underground cable at Station 216+90, 136 feet LT.
* Trench cable from Station 216+87, 146 feet RT to splice point of existing underground cable at Station 217+02, 147 feet RT.
* Underground cable crossing CTH TT at Station 216+85 to be discontinued.
* Underground cable from Station 216+85 to approximately Station 220+25 on the west side CTH TT then crossing under to the east at Station 220+70 to be discontinued.
* Trench cable from Station 223+68, 150 feet LT to splice point of existing underground cable at Station 224+46, 188 feet LT.
* Bore electrical cable to connect between existing pedestal located at southwest property corner of 604 Mesa Ct and northwest property corner of 608 Mesa Court to new pole installed for service of building for property address W270 S1920.
* Trench cable from Station 237+00, 100 feet LT to splice point of existing underground cable at Station 236+62, 108 feet LT.

**Underground (#3955542)**

**CTH TT/Madison Street**

* Trench cable from Station 53+67, 58 feet LT to new pad mount transformer at Station 54+12, 53 feet LT.
* Bore cable from Station 54+12, 53 feet LT to Station 257+21, 96 feet RT. Cable will have four splice points changing direction from east-west to north-south.
* Trench cable from pole at Station 54+23, 37 feet LT to Station 53+67, 58 feet LT.
* Trench cable from pole at Station 52+58, 48 feet LT to Station 52+59, 55 feet LT.
* Bore cable from 52+59, 55 feet LT to Station 261+10, 96 feet RT. Cable will have three splice points changing direction from east-west to north-south.
* Trench cable from Station 261+10, 96 feet RT to Station 261+10, 86 feet RT.
* Trench cable from splice point servicing 108/110 Harrogate Drive at Station 257+08, 101 feet RT to Station 257+21, 96 feet RT.
* Trench cable from splice point servicing 112/114 Harrogate Drive at Station 257+55, 98 feet RT to Station 257+21, 96 feet RT.

**Underground (#3955543)**

**CTH TT/Madison Street**

* Bore one 6-Inch diameter crossing Station 47+50 (R/L of Madison Street), Station 253+45, and Station 52+05 (R/L of Madison Street). Cable will be trenched from new pole installed at Station 52+20, 48 feet LT to Station 52+05, 40 feet LT. A locating pedestal will be installed at Station 253+45, 188 feet RT. Four splice points will be used in the cable to change direction underground.

We Energies construction on the work requests 3948247, 3955536, 3955542, and 3955543 is anticipated to occur between April and Mid-June of 2018. The dates assume no lost work days due to inclement weather, wet spring work or emergency power restoration due to storms. Pole removals are dependent upon the removal of communication companies’ facilities (underbuilds) from We Energies poles. Upon relocations by the underbuilds, We Energies will remove the poles.

**Overhead (#3955538)**

**Waukesha Bypass (Off Existing Alignment)**

* Install two new poles at Station 12+45 and Station 12+46 (R/L of Glacial Drumlin Trail, Southwest Connection) perpendicular to the trail, replacing two existing poles that would be in conflict.

**CTH TT**

* Relocate existing aerial power line crossing CTH TT from Station 56+39, 1 foot LT to Station 56+78, 40 feet RT. New aerial power line will cross over new proposed extension of MacArthur Road from northwest corner to southeast corner, Station 56+38, 53 feet LT to Station 57+28, 24 feet RT.
* Install new pole at Station 177+85, 85 feet RT to replace pole at Station 177+54, 87 feet RT.
* Install new poles on existing overhead lines on north and south sides of the Wisconsin Southern Railroad.

**Underground (#3955538)**

**Waukesha Bypass (Off Existing Alignment)**

* Bore three parallel 6-Inch cables with a 5 foot on center spacing. Placing from west side of proposed Waukesha Bypass, crossing underneath to the east and terminating on south side of MacArthur Road. The cables will have three splice points between connection points of existing underground lines.

Center cable will have splice point with existing underground cable at Station 188+15, 106 feet LT to next splice pint at Station 185+22, 106 feet LT. Cable will then cross underneath proposed Waukesha Bypass where excavation below subgrade (EBS) is to occur. The cable will have 2 feet of cover upon completion of EBS. Next splice point will be on east side of the proposed Waukesha Bypass at Station 185+22, 103 feet RT followed by another splice point at Station 51+28 (R/L of MacArthur Road), 56 feet RT and completing final connection to existing underground line at Station 53+68, 56 feet RT.

Existing underground line between the new connection points to be discontinued.

* Bore two parallel 6-Inch cables with a 5-foot on center spacing from Station 19+00 (R/L of Glacial Drumlin Trail, Southeast Connection) crossing Wisconsin Southern Railroad line 6 feet below the rail bed, tying into existing underground lines at Station A 176+78, 110 feet RT. The cables will have two splice points between connection points of existing underground lines. Two locating pedestals will be located at the connection points for each underground line south of the railroad line.

Existing underground line between the new connection points to be discontinued.

**CTH TT**

* Bore one 4-Inch diameter crossing Station 182+42, with a splice point at Station 182+42, 174 feet RT, terminating at new pole with Station 73+22, 25 feet LT. Underground cable to replace aerial power line from Station 182+42, 109 feet LT to Station 70+83, 42 feet LT.

We Energies construction on the work request 3955538 is anticipated to occur between mid-June and early July 2018. The dates assume no lost work days due to inclement weather, wet spring work or emergency power restoration due to storms. Pole removals are dependent upon the removal of communication companies’ facilities (underbuilds) from We Energies poles. Upon relocations by the underbuilds, We Energies will remove the poles. Work at the railroad area anticipated to occur during the month of August 2018

**Overhead (#3955540)**

**Waukesha Bypass (Off Existing Alignment)**

* Disconnect aerial power lines after service to S31 W26897 Sunset Road has been removed.
* Disconnect aerial power lines after service to S32 W26620 Hawthorne Hollow Drive has been removed.

**Sunset Drive**

* Relocate existing aerial power line on south side of Sunset to new poles at Station 63+54, 40 feet RT and Station 61+58, 48 feet RT.

We Energies construction on the work request 3955540 is anticipated to occur between early July and mid-July 2018. The dates assume no lost work days due to inclement weather, wet spring work or emergency power restoration due to storms. Pole removals are dependent upon the removal of communication companies’ facilities (underbuilds) from We Energies poles. Upon relocations by the underbuilds, We Energies will remove the poles.

**Overhead (#3955541)**

**Genesee Road/ Les Paul Parkway**

* Install aerial power line from Station 34+77, 60 feet LT to Station 36+47, 78 feet LT.
* Place aerial power line across Genesee Road at Station 37+35.
* Relocate aerial power line from Station 109+05, 92 feet RT to Station 106+04, 193 feet LT.
* Place aerial power line across proposed Waukesha Bypass at Station 106+00.
* Move existing light pole at Station 104+00, 56 feet RT.
* Remove aerial power from Station 47+59, 96 feet LT to 52+37 165 feet RT.

**Saylesville Road**

* Relocate aerial power line from Station 17+31, 134 feet LT to Station 16+90, 370 feet RT.
* Place aerial power line across proposed Saylesville Road at Station 13+36.
* Place aerial power line across proposed Saylesville Road at Station 17+20.

**Underground (#3955541)**

**Waukesha Bypass**

* Bore cable from Station 107+52, 143 feet RT to Station 103+50, 112 feet RT, splicing into existing underground line. Cable will have one splice point in‑between at Station 104+88, 144 feet RT.

**Genesee Road**

* Bore one 2-Inch diameter crossing Station 47+50 from Station 17+60 (R/L of Saylesville Road), 100 feet RT of new pole to Station 47+50, 120 feet LT of new pedestal. Two splice points will be in the line, one at Station 45+84, 216 feet RT and Station 47+50, 125 feet RT.
* Trench cable from Station 47+50, 120 feet LT to new pole at Station 47+60, 120 feet LT.

We Energies construction on the work request 3955541 is anticipated to occur between mid-July and early August 2018. The dates assume no lost work days due to inclement weather, wet spring work or emergency power restoration due to storms. Pole removals are dependent upon the removal of communication companies’ facilities (underbuilds) from We Energies poles. Upon relocations by the underbuilds, We Energies will remove the poles.

**Work Request # 3948247 (Waukesha Bypass)**

| **Station No.** | **Sequence No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
|  | 100 | - | Wewauk Substation |
| 264+14 L100 | 110 | 17- | Install Pole |
| 263+72 L100 | 112 | 14-04383 | Pole to Remain |
| 264+11 L210 | 114 | 17- | Install Pole and Anchor |
| 264+15 L79 | 120 | 17- | Install Pole - 3 feet Fill – grade around |
|  | - | - | Install Anchor – grade around |
| 264+27 R90 | 122 | 17- | Pole (Installed on WISDOT: 2788‑00-72). Remove Temporary Anchors |
| 262+23 R86 | 124 | 17- | Install Pole – 1-foot fill, grade around |
| 264+29 L47 | 125 | 05-17264 | Remove Pole |
| 264+31 R45 | 127 | 03-05591 | Remove Pole and Anchor |
| 263+25 R31 | 129 | 85-03503 | Remove Pole and Anchor |
| 263+84 L80 | 130 | 17- | Install Pole – 2.5 feet Fill – grade around |
| 263+60 L100 to  263+55 L81 | 135 -140 | - | Discontinue Cable |
| 262+58 R22 | 135 | 62-3403 | Remove Pole |
| 262+53 L44 | 139 | 05-17263 | Remove Pole and Anchor |
| 263+55 L81 | 140 | 17- | Install Pole |
| 260+96 L81 | 150 | 17- | Install Pole - 5 feet Fill – grade around |
| 261+10 R86 | 152 | 17- | Install Pole |
|  | - | - | Install Anchors |
| 260+80 R30 | 155 | 57-1799 | Remove Pole |
| 258+49 L84 | 160 | 17- | Install Pole |
|  | - | - | Install Anchor |
| 258+93 R41 | 163 | 62-3862 | Remove Pole |
| 257+13 R70 | 165 | 63-3859 | Remove Pole |
| 257+13 R81 | 167 | 86U4105 | Remove Ped |
| 255+89 L91.5 | 170 | 17- | Install Pole – 3.5 feet Cut – grade around |
| 255+87 R91 | 172 | 17- | Install Pole – 1 feet Cut – grade around |
|  | - | - | Install Anchor |
| 253+99 L98 | 180 | 17- | Install Pole and Anchor - 1.5 feet Fill – grade around |
| 254+01 R151 | 182 | 17- | Install Pole |
|  | - | - | Install Anchor |
| 254+04 R143 | 184 | - | Splice |
| 253+92 R113 | 185 | 73-7293 | Remove Pole |
| 51+60 L48 | 186 | 17- | Pole Set WR# 3955543 |
| 252+31 L106 | 190 | 17- | Install Pole – Set 3 feet deeper for Marsh Excavation |
| 252+60 R141 | 192 | 17- | Install Pole |
|  | - | - | Install Anchor |
| 252+60 R141 to | 192-194 | - | Install Cable |
| 252+27 R146 | 194 | 84U3041 | Pedestal to remain |
| 252+22 R133 | 195 | 00-04724 | Remove Pole |
| 250+44 L115 | 200 | 17- | Install Pole |
| 250+44 L100 | - | - | Install Anchor |
| 250+42 R144 | 205 | 62-3895 | Remove Pole |
| 248+56 L124 | 210 | 17- | Install Pole |
| 248+72 R118 | 215 | 62-3896 | Remove Pole |
| 246+72 L129 | 220 | 17- | Install Pole |
|  | - | - | Install Anchor |
| 245+43 L129 | 230 | 17- | Install Pole |
| 245+01 R67 | 235 | 02-07917 | Remove Pole |
|  | 235-244 |  | Discontinue Cable |
| 246+73 R90 | 222 | 13-02675 | Pole to Remain, Install Anchor |
| 243+11 L129 | 240 | 17- | Install Pole |
|  | - | - | Install Anchor |
| 243+45 R100 | 242 | 17- | Install Pole |
|  | - | - | Install Anchor |
| 243+45 to 245+20 | 242-244 | - | Install Cable – 2 feet Extra Deep for Marsh Excavation |
| 245+20 R111 | 244 | - | Splice Pit |
| 243+49 R40 | 245 | 10-13376 | Remove Pole |
| -- | 248 | 85U4872 | Transformer at 3028 Cone View Lane |
| 240+64 L127 | 250 | 17- | Install Pole |
| 241+63 L02 | 255 | 02-07232 | Remove Pole |
| 238+82 L121 | 260 | 17- | Pole set on WR#3955536 |
| 239+55 L48 | 265 | 62-3908 | Remove Pole |
| 239+57 R36 | 267 | 61-6610 | Remove Pole |
| 238+45, 74 feet LT | 270 | 62-3909 | Pole Removed on WR#3955536 |

**Work Request # 3955536 (Merrill Hills Rd / Waukesha Bypass)**

| **Station No.** | **Sequence**  **No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
| 82+70, 25 feet RT | 100 | 17- | Install pole and anchors |
| 82+75, 25 feet RT | 101 | 98-07901 | Remove pole and anchors |
| 215+16, 223 feet RT | 102 | 17- | Install pole |
| 215+16, 217 feet RT | 103 | 62-3897 | Remove pole |
| 216+87 148 feet RT. | 104 | 17- | Install pole, primary riser |
| 216+88 127 feet RT | 105 | 62-3879 | Remove pole |
| 216+88 127 feet RT to  215+64, 118 feet LT | 105-152 | - | Discontinue cable |
| 217+02, 152 feet RT | 106 | N/A | Primary 1 phase splice |
| 216+66, 94 feet RT | 109 | 88-11711 | Remove pole and anchor |
| 212+39, 126 feet RT | 120 | 17- | Install pole and anchor |
| 212+32, 101 feet LT | 130 | 17- | Install pole and anchors |
| 213+52, 115 feet LT | 140 | 17- | Install pole and anchors |
| 215+57, 117 feet LT | 150 | 17- | Install pole, 1 phase primary riser |
| 215+64, 118 feet LT | 152 | N/A | Primary splice, 1 phase |
| 218+80, 72 feet RT | 155 | 78-7257 | Remove pole |
| 216+85, 119 feet LT | 160 | 17- | Install pole, 1 phase primary riser |
| 216+90, 136 feet LT | 162 | N/A | Primary splice, 1 phase |
| to | 162-165 | - | Discontinue cable |
| 220+70, 19 feet RT | 165 | 62-3877 | Remove pole |
| 218+63, 119 feet LT | 170 | 17- | Install pole |
| 220+40, 120 LT | 190 | 17- | Install pole and anchors, transformer |
| 221+28, 87 feet LT | 192 | 88-06892 | Pole to remain, grade around |
| 222+65, 29 feet LT | 195 | 62-3876 | Remove pole |
| 222+40, 139 feet LT | 200 | 17- | Install pole |
| 223+68, 150 feet LT | 206 | 17- | Install pole |
| 224+46, 188 feet LT | 208 | N/A | 1 phase, primary splice |
| 225+32, 161 feet LT | 210 | 17- | Install pole |
| 224+63, 76 feet LT | 215 | 62-3870 | Remove pole |
| 226+55, 168 feet LT | 220 | 17- | Install pole and anchors |
| No Station | 222-224 |  | Bore cable for service w271 s2170 |
| No Station | 224 | 17- | Install pole for service w271 s2170 |
| 226+64, 118 feet LT | 223 | 75-2649 | Remove pole |
| 227+29, 134 feet RT | 225 | 99-10715 | Remove pole and anchor |
| No Station | 227 | 99-10716 | Remove pole |
| No Station | 229 | 98-11117 | Remove pole |
| 228+24, 147’LT | 230 | 17- | Install pole and anchors |
| 228+27, 151’ LT | 235 | 62-3857 | Remove pole |
| 234+75, 138’ LT | 265 | 62-3885 | Remove pole |
| 235+25, 130’ LT | 270 | 17- | Install pole |
| 236+62, 108’ LT | 285 | 62-3884 | Remove pole |
| 237+00, 100’ LT | 290 | 17- | Install pole |
| 237+00, 100’RT | 292 | 17- | Install pole |
| 237+00, 120’RT | - | - | Install anchor (private property) |
| 237+00 - 236+62 | 290-294 | - | Trench cable |
| 238+45, 74’ LT | 295 | 62-3909 | Remove pole |
| 238+82, 121’ LT | 300 | 17- | Install pole and anchor |

**Work Request # 3955542 (Madison St, Waukesha Bypass)**

| **Station No.** | **Sequence No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
| 54+23 L37 | 100 | 17- | Pole Installed on WR# 3955543 |
| 54+23 L37 to 54+12 L53 | 100 - 102 | - | Trench Cable |
| 54+12 L53 | 102 | - | Install Pad mount Transformer |
| 54+12 L53 to 53+67 L58 | 102 - 104 | - | Trench Cable |
| 54+12 L53 to 52+59 L53 | 102-106 | - | Bore Cable |
| 53+67 L58 | 104 | - | Splice Pit |
| 52+59 L53 | 106 | - | Splice Pit |
| 52+59 L53 to 52+59 L60 | 106 -108 | - | Bore Cable |
| 52+59 L60 | 108 | - | Splice Pit |
| 52+59 L60 to 50+97 L60 | 108 - 110 | - | Bore Cable |
| 50+97 L60 | 110 | - | Splice Pit |
| 50+97 L60 to 256+00 L97 | 110-112 | - | Bore Cable |
| 256+00 L97 | 112 | - | Splice Pit |
| 256+00 L97 to 257+22 R96 | 112 -120 | - | Bore Cable |
| 257+22 R96 | 120 | - | Install Pad mount Transformer |
| 257+22 R96 to 257+08 R101 | 120 - 122 | - | Trench Cable |
| 257+08 R101 | 122 | - | Splice Pit |
| 257+22 R96 to 257+55 R98 | 120 - 124 | - | Trench Cable |
| 257+55 R98 | 124 | - | Splice Pit` |
| 52+58 L48 | 200 | - | Pole Installed on WR# 3955543 |
| 52+58 L48 to 52+59 L55 | 200 - 202 | - | Trench Cable |
| 52+59 L55 | 202 | - | Splice Pit |
| 52+59 L55 to 255+60 R99 | 202 - 204 | - | Bore Cable |
| 255+60 R99 | 204 | - | Splice Pit |
| 255+60 R99 to 256+00 R92 | 204 - 206 | - | Bore Cable |
| 256+00 R92 | 206 | - | Splice Pit |
| 256+00 R92 to 259+68 R86 R86R86R86259+68 R86259+68 R86 | 206-208 | - | Bore Cable 1 feet EXTRA DEEP |
| 259+68 R86 | 208 | - | Splice Pit |
| - | 208 - 210 | - | Bore Cable |
| 261+10 R96 | 210 | - | Splice Pit |
| - | 210 - 212 | - | Trench Cable |
| 261+10 R86 | 212 | 17- | Pole Installed on WR# 3948247 |

**Work Request # 3954443 (Madison St, Waukesha Bypass)**

| **Station No.** | **Sequence**  **No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
| 46+33 L26 | - | 99-10928 | Pole to Remain |
| 47+50 L26 | 100 | 17- | Install Pole |
| - | - | - | Install Anchor |
| 47+50 L26 to | 100 to 102 | - | Bore Cable |
| 47+50 R38 | 102 | - | Splice pit |
| 47+50 R38 to | 102 to 104 | - | Bore Cable |
| 254+82 L102 | 104 | - | Splice pit |
| 254+82 L102 to | 104 to 106 | - | Bore Cable |
| 48+12 L26 | 105 | 88-06599 | Remove Pole |
| 253+45 L108 | 106 | - | Splice pit |
| 253+45 L108 to 253+45 R188 | 106 to 108 | - | Bore Cable |
| 253+45 R188 | 108 | - | Splice pit – Install Locating Pedestal |
| 253+45 R188 to 52+05 L40 | 108 to 132 | - | Bore Cable |
| 52+05 L40 to 52+20 L48 | 132-130 | - | Trench Cable |
| 51+60 L48 | 110 | 17- | Install Pole |
| - | - | - | Install Anchor |
| - | - | - | Install Anchor |
| 46+59 L23 | 115 | 99-05950 | Remove Pole |
| 46+59 L23 to 53+26 L29 | 115 to 145 | - | Discontinue Cable |
| 51+90 L48 | 120 | 17- | Install Pole |
| 50+95 L35 | 125 | 62-3860 | Remove Pole and Anchor |
| 52+20 L48 | 130 | 17- | Install Pole |
| 52+05 L40 | 132 | - | Splice |
| 52+68 L31 | 135 | 73-7291 | Remove Pole |
| 52+58 L48 | 140 | 17- | Install Pole |
| - | - | - | Install Anchor |
| 53+26 L29 | 145 | 99-10926 | Remove Pole |
| 54+23 L37 | 150 | 17- | Install Pole |
| 54+22 L27 | 155 | 73-7290 | Remove Pole |
| 55+96 L26 | 160 | 73-7289 | Pole to Remain |
| 55+93 R28 | 162 | 17- | Install Pole |
| - | - | - | Install Anchor |
| 56+31 R26 | 167 | 62-12169 | Remove Pole |
| 57+76 L27 | 170 | 73-7288 | Pole to Remain |

**Work Request # 3955538** **(Waukesha Bypass, MacArthur Rd, Merrill Hills Rd, Glacial Drumlin Trail)**

| **Station No.** | **Sequence No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
| 188+10 L101 | 100 | - | Splice |
| 188+15 L106 | 102 | - | Splice |
| 188+11 L111 | 104 | 17u | Install Locating Pedestal |
| 188+10 L101 to 185+27 L101 | 100 to 110 | - | Bore Cable, 2 feet extra depth for Marsh Excavation 185+00 to 186+00 |
| 188+15 L106 to 185+22 L106 | 102 to 112 | - | Bore Cable, 2 feet extra depth for Marsh Excavation 185+00 to 186+00 |
| 188+11 L111 to 185+17 L111 | 104 to 114 | - | Bore Cable, 2 feet extra depth for Marsh Excavation 185+00 to 186+00 |
| 185+27 L101 | 110 | - | Splice |
| 185+22 L106 | 112 | - | Splice |
| 185+17 L111 | 114 | - | Splice |
| 185+27 L101 to 185+27 R101 | 110 to 120 | - | Bore Cable – extra depth for EBS Excavation |
| 185+22 L106 to 185+22 R103 | 112 to 118 | - | Bore Cable – extra depth for EBS Excavation |
| 185+17 L111 to 185+17 R105 | 114 to 116 | - | Bore Cable – extra depth for EBS Excavation |
| 185+17 R105 | 116 | - | Splice |
| 185+22 R103 | 118 | - | Splice |
| 185+27 R101 | 120 | - | Splice |
| 185+17 R105 to 51+30 R61 | 116 to 122 | - | Bore Cable, 2 feet extra depth for Marsh Excavation |
| 185+22 R103 to 51+28 R56 | 118 to 124 | - | Bore Cable, 2 feet extra depth for Marsh Excavation |
| 185+27 R101 to 51+26 R51 | 120 to 126 | - | Bore Cable, 2 feet extra depth for Marsh Excavation |
| 51+30 R61 | 122 | - | Splice |
| 51+28 R56 | 124 | - | Splice |
| 51+26 R51 | 126 | - | Splice |
| 51+30 R61 to 53+67 R64 | 122 to 128 | - | Bore Cable |
| 51+28 R56 to 53+68 R56 | 124 to 130 | - | Bore Cable |
| 51+26 R51 to 53+80 R51 | 126 to 132 | - | Bore Cable |
| 53+67 R64 | 128 | - | Splice |
| 53+68 R56 | 130 | - | Splice |
| 53+80 R51 | 132 | - | Splice |
| 188+10 L101 to 53+80 R51 | 100 to 132 | - | Discontinue Cable |
| 188+15 L106 to 53+68 R56 | 102 to 130 | - | Discontinue Cable |
| 188+11 L111 to 53+67 R64 | 104 to 128 | - | Discontinue Cable |
| 56+38, 53 feet LT | 140 | 17- | Install new pole and Anchor |
| 56+39, 01 feet LT | 145 | 98-07910 | Remove pole and light |
| 57+28, 24 feet RT | 150 | 17- | Install new pole and Anchor |
| 56+78, 40 feet RT | 155 | 66-8797 | Remove pole |
| 182+50 L115 | 160 | 17U | Install Pad mount Transformer |
| 182+40 L109 | 162 | 17- | Install Pole |
| 182+26 L108 | 164 | - | Customer Pole |
| 182+26 L108 to 70+83, 42 feet LT | 164 to 200 |  | Remove Overhead Conductor |
| 182+50 L115 to 182+28 R174 | 160 to 170 | - | Bore Cable – extra depth for Marsh Excavation |
| 182+28 R174 | 170 | - | Splice |
| 182+28 R174 to 72+94 L31 | 170 to 172 | - | Bore Cable |
| 72+94 L31 | 172 | - | Splice |
| 72+94 L31 to 73+22 L25 | 172 to 180 | - | Trench Cable |
| 73+22 L25 | 180 | 17- | Install new Pole |
| 181+83, 58 feet LT | 175 | 76-2258 | Remove pole |
| 180+33, 77 feet RT | 185 | 76-2259 | Remove pole |
| 70+83, 42 feet LT | 200 | 01-18738 | Pole to remain |
| 177+52, 85 feet RT | 210 | 17- | Install new pole W/9 feet of fill, grade around pole |
| 177+54, 87 feet RT | 215 | 98-07910 | Remove pole |
| 176+57 R115 | 212 | - | Splice |
| 176+57 R115 to 174+57 R118 | 212 to 216 | - | Bore Cable – extra depth for Marsh Excavation and Storm outfall. |
| 176+78 R110 to 174+55 R113 | 214 to 218 | - | Bore Cable – extra depth for Marsh Excavation and Storm outfall |
| 174+57 R118 | 216 | - | Splice |
| 174+55 R113 | 218 | - | Splice |
| 174+57 R118 to 19+00 L63 | 216 to 222 | - | Bore Cable |
| 174+55 R113 to 19+05 L68 | 218 to 220 | - | Bore Cable |
| 19+05 L68 | 220 | - | Splice |
| 19+00 L63 | 222 | - | Splice |
| 19+05 L68 to 19+05 R97 | 220 to 310 | - | Bore Cable – extra depth for Trail Excavation |
| 19+00 L63 to 19+00 R90 | 222 to 300 | - | Bore Cable – extra depth for Trail Excavation |
| 45+85, 41 feet RT | 228 | 71-5247 | Install anchor |
| 46+75, 39 feet RT | 230 | 17- | Install new pole |
| 10+85, 09 feet LT | 235 | 71-5377 | Remove pole |
| 176+14, 34 feet LT | 237 | 01-18737 | Remove pole |
| 12+45, 12 feet LT | 240 | 17- | Install new pole with 4 feet of fill, grade around pole |
| 12+44, 05 feet LT | 245 | 01-18753 | Remove pole |
| 12+46, 15 feet RT | 250 | 17- | Install new pole with 2 feet of fill, grade around pole |
| 12+44, 06 feet LT | 255 | 01-18752 | Remove pole |
| 62+43, 64 feet LT | 260 | 17- | Install new pole |
| 62+44, 34 feet LT | 270 | 17- | Install new pole |
| 62+45, 31 feet LT | 275 | 57-1641 | Remove pole |
| 174+23, 75 feet LT | 277 | 10U7378 | Remove locating pedestal |
| 174+17, 73 feet RT | 280 | 17- | Install new pole with 8 feet of fill, Set 3 feet extra deep for Marsh Excavation, grade around pole |
| 174+14, 66 feet RT | 285 | 71-5106 | Remove pole |
| 172+92, 83 feet RT | 290 | 17- | Install new pole with 4 feet of fill, grade around pole |
| 173+10, 65 feet RT | 295 | 60-2326 | Remove pole |
| 19+00, 90 feet RT | 300 | 17U | Install electric pedestal |
| 19+05, 97 feet RT | 310 | 17U | Install electric pedestal |
| 19+75, 19 feet RT | 320 | 17- | Install new pole |
| 19+45, 02 feet RT | 325 | 81-01167 | Remove pole |
| 176+57 R115 to 174+42 L85 | 212 to 277 |  | Discontinue 2 sets of Cables |
| 174+42 L85 to 19+05 R97 | 277 to 310 |  | Discontinue 2 sets of Cables |
| 19+05, 97 feet RT | 310 | 17U | Install electric pedestal |
| 19+75, 19 feet RT | 320 | 17- | Install new pole |
| 19+45, 02 feet RT | 325 | 81-01167 | Remove pole |
| 176+57 R115 to 174+42 L85 | 212 to 277 |  | Discontinue 2 sets of Cables |
| 174+42 L85 to 19+05 R97 | 277 to 310 |  | Discontinue 2 sets of Cables |

**Work Request # 3955540 (Sunset, Hawthorne Hollow, Waukesha Bypass)**

| **Station No.** | **Sequence**  **No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
| No Station | 100 | 51-4159 | Pole to Remain, Add Anchor |
| No Station | 115 | 51-4158 | Remove pole |
| No Station | 125 | 10-02265 | Remove pole |
| No Station | 135 | 96-17202 | Remove pole and guy/anchor |
| 61+58, 48 feet RT | 140 | 17- | Install new pole and anchors |
| 61+58, 32 feet RT | 145 | 60-5584 | Remove pole and guys/anchors |
| 63+54, 40 feet RT | 150 | 17- | Install new pole - Set 2 feet extra deeper – grade around |
| 63+54, 34 feet RT | 155 | 60-2172 | Remove pole |
| 65+52, 33 feet RT | 160 | 60-5585 | Pole to Remain |
| No Station | 170 | 06-08275 | Pole to Remain – Install Anchor |
| No Station | 180 | 56-6241 | Pole to Remain, Top Pole |
| 135+59, 103 feet’ LT | 195 | 53-13694 | Remove pole |
| 134+91, 06 feet LT | 205 | 56-6242 | Remove pole |
| 134+22, 86 feet RT | 215 | 34-1040 | Remove pole and guys/anchors |
| 132+96, 08 feet LT | 217 | 56-6240 | Remove pole and anchor |
| 132+01, 20 feet RT | 219 | 46-3725 | Remove pole and guy/anchor |
| 133+31, 204 feet’ RT | 225 | 39-2588 | Remove pole and guy/anchor |

**Work Request # 3955541 (Saylesville Rd, Genesee Rd, Waukesha Bypass)**

| **Station No.** | **Sequence**  **No.** | **Pole No.** | **Work Proposed** |
| --- | --- | --- | --- |
| 12+90, 80 feet RT | 100 | 17- | Install Pole and Anchor |
| 12+88, 80 feet RT | 105 | 96-05347 | Remove pole |
| 13+91, 78 feet RT | 110 | 17- | Install Pole |
| 17+33, 132 feet LT | 130 | 17- | Install Pole and Anchors |
| 17+31, 134 feet LT | 135 | 97-10307 | Remove Pole and Anchors |
| 16+18, 72 feet RT | 137 | 97-10308 | Remove pole |
| 16+90, 370 feet RT | 140 | 96-05346 | Pole to Remain – Remove Anchor |
| 34+77, 60 feet LT | 150 | 17- | Install new pole – 2 feet Fill Grade Around |
| 34+79, 54 feet LT | 155 | 98-12869 | Remove pole |
| 36+47, 78 feet LT | 160 | 17- | Install Pole and Anchor |
| 36+45, 54 feet LT | 165 | 98-12823 | Remove Pole |
| 37+35, 79 feet LT | 170 | 17- | Install Pole and Anchor (Anchor on Private Property) |
| 37+45, 57 feet RT | 180 | 98-12856 | Remove Anchor |
| 17+60, 100 feet RT | 190 | 17- | Install new pole and Anchor |
| 17+60, 100 feet RT to  45+84, 216 feet RT | 190 to 192 | - | Bore underground cable |
| 45+84, 216 feet RT  47+50 feet 125 feet RT | 192 to 200 | - | Bore underground cable |
| 45+84, 216 feet RT | 192 | - | Splice Pit |
| 47+50’ 125 feet RT to  47+50, 120 feet LT | 200 to 210 | - | Bore underground cable |
| 47+50, 125 feet RT | 200 | - | Splice Pit |
| 47+50,120 feet LT | 210 | 17U | Install Pad mount transformer |
| 47+50,120 feet LT to 47+60,120 feet LT | 210 to 220 | - | Trench Cable |
| 47+60,120 feet LT | 220 | 17- | Install Pole |
| 47+59, 96 feet LT | 225 | 73T40038 | Pole to be Removed by AT&T |
| 48+71, 92 feet LT | 235 | 68-24394 | Remove pole and anchors |
| 51+65, 74 feet LT | 245 | 96-05777 | Remove pole and anchors |
| 52+37, 165 feet RT | 246 | 72-5300 | Pole to Remain |
| 58+15, 72 feet RT | 250 | 68-24387 | Install anchor 2 ft. deeper for 2 feet cut |
| 106+04, 193 feet LT | 260 | 06-05349 | Pole to Remain |
| 106+04, 142 feet LT | 270 | 17- | Install Pole |
| 106+00, 132 feet RT | 280 | 17- | Install new pole and anchors |
| 103+89, 120 feet RT | 282 | 96-10794 | Relocate light pole to this Station |
| 103+92, 93 feet RT | 282 | 96-10794 | Remove light pole from this Station |
| 107+13, 90 feet RT | 285 | 96-05254 | Remove pole |
| 108+00, 146 feet RT | 290 | 17- | Install new pole |
| 108+09, 122 feet RT | 295 | 09-01673 | Remove pole |
| 103+50, 112 feet RT to  107+52, 143 feet RT | 292, 294 |  | Place new underground cable |
| 109+05, 138 feet RT | 300 | 96-05271 | Install anchor w/ext. for 2 feet of fill |

The field contact for WE Energies – Electricis:

Mr. Steven J. King

S13 W33800 Hwy 18

Delafield, WI 53018

Work: (262) 968-5768

Cell: (414) 940-0570

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Milwaukee, WI 53203

(414) 221-5617

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**WE Energies – Gas** has Natural Gas facilities located throughout the length of the project. This work will be performed by WE Energies prior to the start of road construction with utility construction anticipated to begin during late summer/early fall of 2017 and take 90 working days to complete.

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| * 271+61, LT – service crossing on west side of CTH TT – 6 inch PE * 271+61 – 254+74, LT/RT – north-south direction along west side of CTH TT – 4 inch PE * 263+30, LT – 53+00, RT – east-west direction along south side of Kisdon Hill Drive – 2 inch PE * 254+80, RT – 53+75, RT – east-west direction along south side Madison Street – 2 inch PE * 254+80, RT – 47+60, RT – east-west direction along south side Madison Street – 2 inch PE * 221+00, LT – along south side of Kame Terrace – 4 inch PE * 222+00, LT – 84+00 LT – Merrill Hills Road (CTH TT) – 4 inch PE * 72+60, LT – 65+00, LT – along west side of Merrill Hills Road (CTH TT) – 4 inch PE * 35+75, LT/RT – crossing STH 59 / Genesee Road * 42+60, LT/RT – crossing STH 59 / Genesee Road * 42+60, LT – 47+25, LT - STH 59 / Genesee Road * 52+50, RT – 57+00, RT – along east side of CTH X / Genesee Road – 6 inch PE | Facilities planned to be discontinued and remain in place |

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| * 4-inch Steel along west Merrill Hills Road at Railroad crossing * 4-inch PE along west side of Merrill Hills Road north and south at Kame Terrace * 4-inch PE along south side of Madison Street west of CTH TT * 6-inch Steel along Madison Street east of CTH TT * 4-inch PE from Fiddlers Creek Drive south to Madison Street * 2-inch PE at south side of Kisdon Hill Drive * 6-inch Steel along south east corner CTH X / Genesee Road | Facilities are no longer in use but have been left in place in the project area. |

|  |  |  |
| --- | --- | --- |
| **Station** | **Work Proposed** | **Offset** |
| **CTH TT/Proposed Waukesha Bypass** | | |
| 271+61 to 253+64 | 1,566 feet of 6-inch PE  Direct Bore | North-south direction, with offset  varying from 84’ LT – 90’ LT of R/L. |
| 265+25 to 53+00 | 370 feet of 2-inch PE Direct Bore | East-west direction crossing for  Kisdon Hill Drive. |
| 254+82 to 47+67 | 143 feet of 6-inch PE Open Cut | East-west direction connecting to existing line on west leg of  Madison Street. |
| 253+94 | 321 feet of 6-inch PE Direct Bore  and 218 6-inch PE Direct Bore | East-west direction crossing under CTH TT connecting to existing line on east leg of Madison Street at Station 53+75. |
| 232+56 to 234+00 | 145 feet of 4-inch PE  Direct Bore | Northeast direction, line offset to accommodate for proposed storm sewer. |
| 226+48 | 262 feet of 6-inch PE  Direct Bore | East-west direction crossing under CTH TT, tied into existing line on  west side and ending on east side of roadway. |
| 226+48 to 84+08 | 1,210 feet of 6-inch PE  Direct Bore | North-south direction, with offset  varying from 2 feet LT – 6 feet LT of right-of-way. |
| 84+08 | 70 feet of 6-inch PE Direct Bore | East-west direction crossing under CTH TT, tied into existing line on  west side. |
| **Genesee Road/STH 59** | | |
| 33+33 to 47+25 | 1,428 feet of 6-inch PE  Direct Bore | East-west direction, with offset  varying from 2 feet RT – 10 feet RT of right-of-way; line connecting into existing line on west side of Valley View Drive. |
| 52+62 to 57+00 | 429 feet of 8-inch PE  Direct Bore | East-west direction connecting to existing line, parallel offset of line to abandoned. |
| Note: PE = Polyethylene pipe | | |

Relocations and adjustments of WE Energies Gas facilities are anticipated to commence prior to the start of this roadway project.

It is imperative that the highway contractor contact WE Energies before removing any gas facilities or electrical underground cables, to verify that they have been abandoned and carry no natural gas or electrical current. The contractor must not assume that unmarked facilities have been abandoned. At no time is it acceptable to push, pull, cut or drill an unmarked facility without explicit consent from We Energies.

Contractor shall contact We Energies gas dispatch at (800) 261-5325 or We Energies electric dispatch at (800) 662-4797 at least 24 hours prior to removing any abandoned gas facilities or electrical cable to verify that they have been abandoned and carry no natural gas or electrical current. There may be locations where existing or discontinued utilities are not shown on the plans.

**Contractor must call the We Energies 24 hour Dispatch lines to arrange for this verification.**

**We Energies Electric Dispatch #1-800-662-4797**

**We Energies Gas Dispatch #1-800-261-5325**

The construction field contact for We Energies – Gas is:

Ms. Danielle Fink

500 S. 116th Street

West Allis, WI 53214

(414) 651-3067

danielle.fink@we-energies.com

**Windstream - OSP Network (Communication)** has aerial facilities that will require relocation and new installations.

Windstream relocation work is anticipated to last 45 working days and will begin after Charter has completed their installations.

New aerial fiber will be placed on the new WE Energies poles from Station 264+32, 90 feet RT, following the new WE Energies power pole placement route to the new WE Energies pole located at Station 82+70, 25 feet RT (existing Merrill Hills Rd). From the new WE Energies pole at Station 82+70, 25 feet RT the existing aerial fiber will have attachments transferred to new WE Energies poles between Stations 177+52, 85 feet RT to 62+44, 34 feet LT.

The construction field contact for Windstream is:

Ms. Mary Beth Fisher

Project Manager – OSP Network

13935 Bishops Dr.

Brookfield, WI 53005

Work: (262) 792-7938

Cell: (414) 313-9032

[Mary.B.Fisher@windstream.com](mailto:Mary.B.Fisher@windstream.com)

**Wisconsin Department of Transportation - Traffic Signals** – has underground and above ground signal facilities at the intersection of STH 59 and CTH X. The traffic signals will be removed as part of this construction project.

|  |  |
| --- | --- |
| **Location and Conflict** | **Resolution** |
| * CTH X (Saylesville) and STH 59 (Genesee Road) * STH 59 and CTH X (Genesee Road) * USH 18 / Meadowbrook and CTH D (Sunset Drive) * USH 18 / Meadowbrook and Madison Street. | Signalized intersection |

The construction field contacts for WisDOT Traffic Signal Operations are:

Mr. David Brantner

141 NW Barstow St.

Waukesha, WI 53187

[david.brantner@dot.wi.gov](mailto:david.brantner@dot.wi.gov)

WisDOT Electric Field Unit

935 S. 60th St.

West Allis, WI 53214

(414) 266-1170

1. Municipality Acceptance of Sanitary Sewer and Water Main Construction.

Both the department and City of Waukesha and Waukesha Water Utility personnel will inspect construction of sanitary sewer and water main under this contract. However, construction staking, testing, and acceptance of the sanitary sewer and water main construction will be by the City of Waukesha and Waukesha Water Utility.

stp-105-001 (20140630)

1. Referenced Construction Specifications.

Perform the sanitary sewer and water main work according to the Standard Specifications for Sewer and Water Construction in Wisconsin, latest Edition (SSSW), and the Specifications for Water Main & Service Lateral Materials and the Installation of Water Main & Appurtenances for Waukesha Water Utility of the City of Waukesha dated August 29, 2014. If there is a discrepancy or conflict between the referenced specifications and the standard specifications regarding contract administration, part 1 of the standard specifications governs.

1. Other Contracts.

The following projects will be under construction concurrently with the work under this contract. Coordinate all construction activities including work zone traffic control, roadway and lane closures, and other work items as required with other contracts.

**West Waukesha Bypass North**

WisDOT and Waukesha County, Wisconsin have a project north of this contract. Work under this contract Project 2788-02-70 and 2788-00-72 was LET in February of 2017. This project connects to this contract at the northern limit, Station 273+75. Project 2788‑02-70 and 2788-00-72 are anticipated to be completed June 29, 2018. Traffic switches must be coordinated between both projects. Coordinate activities with the project contractor and engineer. The WisDOT engineer is:

John Kanzenbach, (262) 548-6467, [John.Kanzenbach@dot.wi.gov](mailto:John.Kanzenbach@dot.wi.gov)

**Wisconsin and Southern Railroad LLC Southern Siding Track Relocation**

WSOR will complete the southern Siding track removal. Coordinate construction activites with the WSOR representative and engineer. The WSOR contact is:

Roger Schaalma, Superintendent of Maintenance of Way, Wisconsin and Southern Railroad LLC, 1890 East Johnson Street, Madison, WI 53704; Telephone: (608) 620-2044; Ext. 4201; email [rschaalma@watcocompanies.com](mailto:rschaalma@watcocompanies.com) for consultation on railroad requirements during construction.

**ATR**

A solar powered Wavetronic Detector on a type 3 pole will be installed by WisDOT at Station 164+00, 69 feet RT under a separate contract #407633. Coordinate construction activitites with Russell Lewis, (608) 516-5754, [Russell.Lewis@dot.wi.gov](mailto:Russell.Lewis@dot.wi.gov)

1. Railroad Insurance and Coordination – Wisconsin and Southern Railroad LLC.

**A Description**

Comply with standard spec 107.17 for all work affecting Wisconsin and Southern Railroad LLC property and any existing tracks.

**A.1 Railroad Insurance Requirements**

In addition to standard spec 107.26, provide railroad protective liability insurance coverage as specified in standard spec 107.17.3. Insurance is filed in the name of Wisconsin and Southern Railroad LLC.

Notify evidence of the required coverage, and duration to Amanda Haggerty, Office Administrator at Wisconsin and Southern Railroad LLC, 1890 East Johnson Street, Madison, WI 53704, telephone (608) 620-2048, email [ahaggerty@watcocompanies.com](mailto:ahaggerty@watcocompanies.com).

Also send a copy to the following: Paul Derksen, SE Region Railroad Coordinator; 141 N. W. Barstow Street, Waukesha, WI 53188; Telephone (262) 548-8770; E-mail: [paul.derksen@dot.wi.gov](mailto:paul.derksen@dot.wi.gov).

Include the following information on the insurance document:

Project 2788-00-71

Project Location: Town of Waukesha, WI

Route Name CTH TT, Waukesha County

Crossing ID 391 530S

Railroad Subdivision Waukesha

Railroad Milepost 22.68

Work Performed: Remove the southerly siding track. Relocate temporary warning devices for southbound roadway in Stage 3. Install new railroad warning devices and new crossing surface.

**A.2 Train Operation**

Approximately 4 through freight trains operate daily at up to 25 mph. In addition to through movements there are movements at slower speeds.

**A.3 Names and addresses of Railroad Representatives for Consultation and Coordination**

**Construction Contact**

Roger Schaalma, Superintendent of Maintenance of Way, Wisconsin and Southern Railroad LLC, 1890 East Johnson Street, Madison, Wi 53704; Telephone: (608) 620-2044; Extension: 4201; email [rschaalma@watcocompanies.com](mailto:rschaalma@watcocompanies.com) for consultation on railroad requirements during construction.

Amend standard spec 108.4 to include the railroad in the distribution of the initial bar chart, and monthly schedule updates. The bar chart shall specifically show work involving coordination with the railroad.

**Flagging Contact**

See Construction Contact. Reference the Crossing ID, Wisconsin Milepost and Subdivision found in A.1.

**Cable Locate Contact**

In addition to contacting Diggers Hotline, contact Amanda Haggerty, Office Administrator; Telephone (608) 620-2048; E-mail [ahaggerty@watcocompanies.com](mailto:ahaggerty@watcocompanies.com) at least five working days before the locate is needed. Reference the Crossing ID, Wisconsin Milepost and Subdivision found in A.1.

WSOR will only locate railroad owned facilities located in the railroad right-of-way. The railroad does not locate any other utilities.

**A.4 Work by Railroad**

The railroad will perform the work described in this section, except for work described in other special provisions and will be accomplished without cost to the contractor.

Prior to Stage 3, the southerly siding track needs to be removed, the new crossing surface for the southbound roadway needs to be completed and temporary railroad warning devices relocated. During Stage 3 the southbound Bypass roadway will carry two-way traffic.

During Stage 3 and prior to the Stage 4 traffic shift, the rest of the new crossing surface need to be completed and the permanent warning devices installed.

Amend standard spec 108.4 to include the railroad in the distribution of the initial bar chart, and monthly schedule updates. The bar chart shall specifically show work involving coordination with the railroad.

**A.5 Temporary Grade Crossing**

If a temporary grade crossing is desired, submit a written request to the railroad representative named in A.3 at least 40 days prior to the time needed. Approval is subject to the discretion of the railroad. The department has made no arrangements for a temporary grade crossing.

**B Railroad Flagging**

Arrange with the railroad for the flagging of trains and safety of railroad operations if clearances specified in standard spec 107.17.1 are not maintained during construction operations.

The following conditions may also warrant flagging:

1. Cranes swinging or handling materials or equipment within 25 feet of the centerline of any track.
2. Construction operations that are in proximity of power lines or railroad signal and communication lines, underground cables, fuel oil facilities or pipe lines and which might result in fire or damage to such facilities, danger to railroad operations or danger to the public in the transaction of business on railroad premises.
3. Excavation, pile driving, placing, or removing cofferdams or sheeting, or similar activities might cause the railroad’s tracks or buildings to be undermined, heaved out of normal level, shifted out of alignment, or otherwise impaired.
4. Bridge painting activities including rigging of falsework, scaffolding or similar activities within 25 feet of the centerline of any track.
5. Deck removal activities within 25 feet of the centerline of any track.
6. Pouring of bridge decks in spans over an operated track.
7. At any other time in railroad representative’s judgment, the contractor’s work or operations constitute an intrusion into the track zone and create an extraordinary hazard to railroad traffic, and at any other time when flagging protection is necessary for safety to comply with the operating rules of the railroad.

Projects with concurrent activity may require more than one flagger.

Projects with heavy contractor activity within 25 feet of the centerline of any track or unusual or heavy impact on railroad facilities will normally require a full-time flagger.

The department and railroad will monitor operations for compliance with the above flagging requirements. Violations may result in removal from railroad property until arrangements to adhere to the flagging requirements are satisfied. If the railroad imposes additional flagging requirements beyond the above flagging requirements due to the previous violations, the contractor shall bear all costs of the additional flagging requirements.

**C Flagging by Railroad – Railroad does not Pay Flagging Costs**

**C.1 General**

*Replace paragraph (3) of standard spec 107.17.1 with the following:*

Comply with the railroad’s rules and regulations regarding operations on railroad right-of-way. If the railroad’s chief engineering officer requires, arrange with the railroad to obtain the services of qualified railroad employees to protect railroad traffic through the work area. Bear the cost of these services and make payment directly to the railroad. Notify the railroad’s chief engineering officer in writing at least 10 business days before starting work near a track. Provide the specific time planned to start the operations.

Work that requires railroad flaggers to occupy the work zone for longer duration or longer than the normal work day will require 40 day written notice to the railroad.

**C.2 Rates – Wisconsin and Southern Railroad LLC**

The following rates, reimbursement provisions, and excluded conditions will be used to determine the contractor’s cost of flagging:

$95 per hour for up to nine-hours at the work-site per day (including wages, labor surcharges, meals, lodging, vehicle and mileage expenses),

$140 per hour for all hours over nine in any week-day (including wages, labor surcharges, meals, lodging, vehicle and mileage expenses),

$190 per hour for up to nine hours at the work-site on Saturdays (including wages, labor surcharges, meals, lodging, vehicle and mileage expenses),

$190 per hour for all hours over nine on Saturdays (including wages, labor surcharges, meal, lodging, vehicle and mileage expenses).

$190 per hour for up to nine hours on Sundays or holidays (including wages, labor surcharges, meal, lodging, vehicle and mileage expenses).

**C.2 Reimbursement Provisions**

The actual cost for flagging will be billed by the railroad. After the completion of the work requiring flagging protection as provided in section B above, the department will reimburse 50% of the cost of such services up to the rates provided above based on paid railroad invoices, except for the excluded conditions enumerated below. In the event actual flagging rates exceed the rates stated above, the department will reimburse 100% of the portion of the rate that is greater than the rates stated above.

**C.3 Excluded Conditions**

The department will not reimburse any of the cost for additional flagging attributable to the following:

1. Additional flagging requirements imposed by the railroad beyond the flagging requirements provided in subsection B above due to violations by the contractor.
2. Temporary construction crossings arranged for by the contractor.

The contractor shall bear all costs of the additional flagging requirements for the excluded conditions.

**C.5 Payment for Flagging**

The department will pay for the department’s portion of flagging reimbursement as specified in section C of this provision under the following item:

ITEM NUMBER DESCRIPTION UNIT

801.0117 Railroad Flagging Reimbursement DOL

The reimbursement payment, as shown on the Schedule of Items, is solely for department accounting purposes. Actual flagging costs will vary based on the contractor’s means and methods.

Railroads may issue progressive bills. Notify the railroad when the work is completed and request a final bill from the railroad. Promptly pay railroad-flagging invoices, less any charges that may be in dispute. The department will withhold flagging reimbursement until any disputed charges are resolved and the final invoice is paid. No reimbursement for flagging will be made by the department if a violation of subsection B is documented.

107-034 (20170615)

1. Dust Control Implementation Plan.

**A Description**

This special provision describes developing, updating, and implementing a detailed Dust Control Implementation Plan (DCIP) for all land-disturbing construction activities and associated impacts both within the project site boundaries and outside the project site boundaries. Incorporate contract bid items that this article specifies into the DCIP.

**B (Vacant)**

**C Construction**

**C.1 General**

Take responsibility for dust control on the project as specified in standard spec 107.18. Minimize dust emissions resulting from land disturbing activities. Do not generate excessive air borne particulate matter (PM) or nuisance dust conditions. Take direct responsibility for controlling dust at all times throughout the duration of the contract, 24 hours per day, 7 days per week, including non-working hours, weekends, and holidays.

Submit a DCIP to the engineer for review at least 14 calendar days before the preconstruction conference. Coordinate with the department, if requested, to resolve DCIP related issues before the preconstruction conference. The department will either approve the DCIP or request revisions. Do not initiate any land-disturbing activities without the department's approval of the DCIP.

**C.2 Dust Control Implementation Plan Contents**

Develop a DCIP tailored to the specific needs of the project. Consider potential impacts to businesses and residences adjacent to the job site. Describe in detail all land disturbing, dust generating activities. Identify strategies to prevent, mitigate, and collect excess dust. Establish clear lines of communication with the engineer to ensure that all dust control issues can be dealt with promptly.

The DCIP shall include, but not be limited to, all of the following:

1. A single contact person with overall responsibility for the DCIP development as well as surveillance and remediation of job related dust. Include the following:

- Name, firm, address, and working-hours phone number

- Non-working-hours phone number

- Email address

1. A site map locating project features, the job site boundaries, all ingress and egress points, air intakes and other dust-sensitive areas, and all public and private paved surfaces within and immediately adjacent to the job site. Show where specific land disturbing, dust generating activities will occur and, to the extent possible, where employing various dust control or prevention strategies.
2. A matrix showing, for each anticipated land disturbing, dust generating activity, the following:

- Preventive measures that shall be employed.

- The applicable contact person.

- The contractor’s timetable and surveillance measures used to determine when remediation is required.

- The specific dust control and remediation measures that shall be employed. List the specific contract bid items that shall be used for payment. Also indicate costs that are incidental to the contract.

- Both maintenance and cleanup schedules and procedures.

- How excess and waste materials shall be disposed of.

1. A description of how off-site impacts shall be monitored and dealt with.

**C.3 Updating the Dust Control Implementation Plan**

Update the DCIP throughout the term of the contract as the engineer directs. Obtain the engineer's approval for all DCIP alterations. Also obtain the engineer's approval for DCIP routine adjustments for weather, job conditions, or emergencies that will have an impact on payment under the bid items listed in the approved DCIP.

**C.4 Dust Control Deficiencies**

Coordinate with engineer to determine deadlines for resolving dust control deficiencies. Deficiencies include, but are not limited to, actions or lack of actions resulting in excessive dust, failing to comply with the contractor’s dust control implementation plan or associated special provisions, and failing to properly maintain equipment.

**D Measurement**

The department will measure the various bid items associated with dust control as specified in the applicable measurement subsections of either the standard specifications or other contract special provisions. The department will not measure work performed under a DCIP alteration unless the engineer specifically approves that alteration.

Measurement under the DCIP shall include, but is not limited to, the contract bid items listed below:

623.0200 Dust Control Surface Treatment

624.0100 Water

628.7560 Tracking Pads

The department will measure work completed under other existing contract bid items if approved as a part of the DCIP. The department will consider new bid items to the contract if proposed under the DCIP. The department will not measure work required under the DCIP that is not included in contract bid items.

**E Payment**

All costs associated with the development and updating of the DCIP are incidental to the contract. The department will pay separately for the work required to implement the actions approved in the DCIP under the contract bid items approved as a part of the DCIP. All other costs associated with work approved under the DCIP are incidental to the contract.

SEF 107-005 (20170323)

1. Environmental Protection, Aquatic Exotic Species Control.

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

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

Ensure that all equipment that has been in contact with waters of the state, or with infested or potentially infested waters, has been decontaminated for aquatic plant materials and zebra mussels prior to being used in other waters of the state. Before using equipment on this project, thoroughly disinfect all equipment that has come into contact with potentially infested waters. Use the following inspection and removal procedures (guidelines from the Wisconsin Department of Natural Resources:

<http://dnr.wi.gov/topic/fishing/documents/vhs/disinfection_protocols.pdf> for disinfection:

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

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

107-055 (20130615)

1. WE Energies Driveways, 266+00 LT.

Construct the WE Energies driveways to Howell Avenue, approximate Station 266+00, LT, through base course within 30 days after the start of construction. The existing substation driveways off of Merrill Hills Road cannot be removed until WE Energies internal site work and the new driveway is complete, not earlier than September 30, 2018.

WE Energies requires a one week notice prior to beginning any driveway work as WE Energies may want to have an inspector present.

Notify WE Energies when the new WE Energies driveway off of Howell Avenue is constructed through base course so WE Energies can complete their site work. The final asphaltic pavement for the driveway cannot be placed until The WE Energies substation expansion work is complete. Coordinate with WE Energies on their internal site work schedule.

Once the asphaltic pavement is placed on the new Howell Avenue driveway the driveways off of Merrill Hills Road can be removed.

The contact for WE Energies – Electricis:

Mr. Paul A. Tadda

333 West Everett Street – A249

Milwaukee WI 53203

Work: (414) 221-5673

Cell: (414) 640-4375

paul.tadda@we-energies.com

1. Notice to Contractor, Notification of Demolition and/or Renovation No Asbestos Found.

James Gondek and Nathan Braun, License Number All-108099 and All-206950, inspected Structure B-67-0038 for asbestos on July 20, 2011 and July 23, 2015. No regulated Asbestos Containing Material (RACM) was found on this structure. A copy of the inspection report is available from: Doug Cain, (262) 548-5603.

According to NR447 and DHS159, ensure that DNR or DHS receives a completed Notification of Demolition and/or Renovation (DNR Form 4500-113 (R 4/11), or subsequent revision) via U.S. mail, hand-delivery, or using the online notification system at least 10 working days prior to beginning any construction or demolition. Pay all associated fees. Provide a copy of the completed 4500-113 form to Doug Cain, (262) 548-5603 and DOT BTS-ESS attn: Hazardous Materials Specialist PO Box 7965, Madison, WI 53707-7965. In addition, comply with all local or municipal asbestos requirements.

Use the following information to complete WisDNR form 4500-113:

* Site Name: Structure B-67-0038, CTH X (Genesee Road) over Pebble Creek
* Site Address: 0.2 Miles north of junction STH 59
* Ownership Information: WisDOT Transportation SE Region, 141 NW Barstow Street, PO Box 798, Waukesha, WI 53187-0798
* Contact: Doug Cain
* Phone: (262) 548-5603
* Age: 59 years old. This structure was constructed in 1959.
* Area: 2,949 SF of deck

Insert the following paragraph in Section 6.g.:

* If asbestos not previously identified is found or previously non-friable asbestos becomes crumbled, pulverized, or reduced to a powder, stop work immediately, notify the engineer, and the engineer will notify the department’s Bureau of Technical Services at (608) 266-1476 for an emergency response according to standard spec 107.24. Keep material wet until it is abated or until it is determined to be non-asbestos containing material.

stp-107-125 (20120615)

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

The department has applied for a U.S. Army Corps of Engineers Section 404 permit. This permit is anticipated to be obtained prior to the letting.

Comply with the requirements of the permit and permit application in addition to requirements of the special provisions. A copy of the permit and permit application is available from the regional office by contacting Doug Cain at (262) 548-5603.

Work within wetlands and waterways shall not begin until the U.S. Army Corps of Engineers Section 404 Permit has been obtained by the department. Pebble Creek crosses the Waukesha Bypass at Station 179+07, CTH X/Genesee Road at Station 55+42 and CTH D/Sunset Drive at Station 67+60. A tributary to Pebble Creek crosses the Waukesha Bypass at Station 245+33. Wetlands are located along the Waukesha Bypass between Station 100+52 to Station 107+50, between Station 113+39 to Station 117+25, between Station 125+93 to Station 130+27, between Station 134+05 to Station 135+08, between Station 160+05 to Station 161+63, between Station 169+63 to Station 183+25, between Station 185+42 to Station 186+73, between Station 343+60 to Station 254+58, between Station 269+47 to Station 271+32. Wetlands are located along CTH X/Genesee Road between Station 50+63 to Station 57+63. Wetlands are located along CTH D/Sunset Drive between Station 54+27 to Station 71+98. Wetlands are located along MacArthur Road between Station 50+78 to Station 56+21.

1. Construction Over or Adjacent to Navigable Waters.

*Add the following to standard spec 107.19:*

The Pebble Creek and Unnamed Pebble Creek Tributary is classified as a state navigable waterway.

107-060 (20171130)

1. Erosion Control Structures.

Within seven calendar days after the commencement of work on the bridge superstructure, place all permanent erosion control devices, including riprap, erosion mat, ditch checks, seed, fertilizer, mulch, soil stabilizer, or any other item required by the contract or deemed necessary by the engineer. These devices shall be in place in the area under the bridges and on both sides of the roadway, from the waterway to a point 100-feet behind the backwall of the abutment. Within said limits, place these devices to a height equivalent to the calculated water elevation resulting from a storm that occurs on the average of once every two years (Q2) as shown on the plan, or as directed by the engineer. Prior to initial construction operations, place turbidity barriers, silt screens, and other temporary erosion control measures as shown on the plans, and remove them after the permanent erosion control devices are in place unless directed otherwise by the engineer.

In the event that construction activity does not disturb the existing ground below the Q2 elevation, the above timing requirements for permanent erosion control shall be waived.

107-070 (20030820)

1. Environmental Protection, Historic Property.

The house at W264 S3641 Saylesville Road, the Sebina Barney House is on the National Historic Register. This property is parcel #4 as shown on the plat.

To minimize impacts to the historic boundary, it is proposed to plant 13 Norway Spruce trees within the existing right-of-way to screen this property from the proposed intersection of Genesee Road/STH 59 and Saylesville Road/CTH X. Contain all construction activities to within the slope intercepts which are beyond this property. Do not stockpile materials or drive or park construction vehicles beyond the slope intercepts.

The Norway Spruce trees need to be planted by September 15, 2018 according to standard spec 632 and as shown on the plans. These trees shall have a one year plant establishment period.

1. 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 shall 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 shall supplement information shown on the plans and not reproduce it. The ECIP shall identify how to implement the project’s erosion control plan. ECIP shall demonstrate timely and diligently staged operations, continuing all construction operations methodically from the initial removals and topsoil stripping operations through the subsequent grading, paving, 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](mailto:craig.webster@wisconsin.gov). Do not implement the ECIP without department approval and perform all work according to the approved ECIP.

A staged ECIP may be required for this project as new areas of the project are disturbed. An ECIP amendment shall be needed prior to Winter shutdown and Spring startup. A 14 day review period should be allowed for each ECIP amendment. Provide the approved ECIP amendment to the engineer prior to winter shutdown and spring startup.

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 designated by the engineer, immediately after the grading is completed within those areas. Seed, fertilize, and mulch/erosion mat top-soiled areas, as designated by the engineer, within 5 days after placement of topsoil. If graded areas are left not completed and exposed for more than 14 days, seed those areas with temporary seed and mulch.

Topsoil shall be placed and permanently restored as the height of the fills progresses. Areas of the project with fills heights less than 10 feet shall be topsoiled and restored once they reach the subgrade shoulder point height including out to the slope intercepts. Areas of the project with fill heights greater than 10 feet shall be topsoiled and permanent restoration placed once the fill height reaches 10 feet including out to the slope intercept. The remaining portion of the fill shall be topsoiled and restored once it reaches the subgrade shoulder point. The contractor shall show timing of these Erosion Control mobilizations as part of proposed schedule in the ECIP. All slopes from the subgrade shoulder point to the slope intercept shall be permanently restored at the time the project is shut down for the winter.

**Dewatering (Mechanical Pumping) for Bypass Water (sediment-free) Operations**

If dewatering bypass operations are required from one pipe structure to another downstream pipe structure or from the upstream to downstream end of a culvert and the bypass flow is not transporting sediments (sand, silt, and clay particles) from a tributary work site area, bypass pumping operations will be allowed provided that the department has been made aware of and approves operation. When pumping bypass flows, the discharge location will need to be stable and not produce any erosion from the discharge velocity that would cause release of sediment downstream. Dewatering is considered incidental to the contract.

**Dewatering (Mechanical Pumping) for Treatment Water (sediment-laden) Operations**

If dewatering operations require pumping of water containing sediments (sand, silt, and clay particles), the discharge will not be allowed to leave the work site or discharge to a storm water conveyance system without sediment removal treatment. Do not allow any excavation for; structures, utilities, grading, maintaining drainage that requires dewatering (mechanical pumping) of water containing sediments (sand, silt, and clay particles) to leave the work site or discharge to a storm water conveyance system without sediment removal treatment.

Prior to each dewatering operation, submit to the department a separate ECIP amendment for sediment removal. Guidance on dewatering can be found on the Wisconsin DNR website located in the Storm Water Construction Technical Standards, Dewatering Code #1061, <http://dnr.wi.gov/topic/stormwater/standards/const_standards.html>. Include reasoning, location, and schedule duration proposed for each operation. Per Code 1061, include all selection criteria: site assessment, dewatering practice selection, calculations, plans, specifications, operations, maintenance, and location of proposed treated water discharge. Provide a stabilized discharge area. If directing discharge towards or into an inlet structure, provide additional inlet protection for back-up protection. Dewatering is considered incidental to the contract.

**Maintaining Drainage**

Maintain drainage at and through worksite during construction according to standard spec 107.20, 204.3.2.1(3), 205.3.3 and 520.3.1(2). Use existing storm sewers, existing culvert pipes, existing drainage channels, temporary culvert pipes, or temporary drainage channels to maintain existing surface and pipe drainage. Pumps may be required to drain the surface, pipe, and structure discharges during construction. Costs for furnishing, operating, and maintaining the pumps is considered incidental to the contract.

SER-107.3 (20161220)

1. 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 8:00 PM until the following day at 7:00 AM, unless prior written approval is obtained from the engineer.

107-001 (20060512)

1. 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 prior to the start of work under this contract and hold one meeting per month thereafter. The contractor shall arrange for a suitable location for the meeting(s) that provides reasonable accommodation for public involvement. The department will prepare and coordinate publication of the meeting notices and mailings for the meeting(s). The contractor shall schedule the meeting(s) with at least two weeks’ prior notice to the engineer to allow for these notifications.

108-060 (20141107)

1. Notice to Contractor – Traffic Signal Equipment Lead Time.

Order traffic signal equipment as soon as possible to assure the equipment is procured in a timely fashion and, therefore, installed, inspected, and ready for turn-on at the required date.

1. Notice to Contractor- Fire Station Flashing Beacons.

On STH 59/Les Paul Parkway the City of Waukesha Fire Station No. 3 is located on the north side of the roadway between Station 99+00 to Station 104+70, RT. The City of Waukesha has a signal warning system in place consisting of a controller, an EVP detection system, wireless communication transmitter and receivers, solar powered flashing beacons and signs.

This equipment has been temporarily installed on six wooden posts.

City of Waukesha forces will remove and relocate these temporary beacon assemblies as needed to facilitate the contractors’ work operations.

Contractor shall coordinate with the City of Waukesha regarding these flashing beacon assemblies. Provide the City of Waukesha 14 days advanced notice to relocated the flashing beacon assemblies. Contact Katie Jelacic at (262) 524-3587 or [kjelacic@waukesha-wi.gov](mailto:kjelacic@waukesha-wi.gov) .

1. Glacial Drumlin State Trail.

The Glacial Drumlin State Trail shall remain open to pedestrian and bicycle traffic throughout the duration of this contract except for when the construction of the proposed underpass Structure C-67-88 occurs in Stages 2E and a portion of Stage 3. A detour route shall be posted as shown in the plans.

Two weeks prior to closure of the Glacial Drumlin Trail, install Fixed Message Signs on both sides of the Merrill Hills Road work zone, to notify trail users of the closure. See traffic control plans for sign details.

It is anticipated that construction of Stage 2E and Stage 3 will extend beyond the time period needed to complete Structure C-67-88, the mainline roadway construction and trail paving.

1. Contract Award and Execution.

*Add the following to standard spec 103 as standard spec 103.9 and 103.10:*

103.9 Bid Escrow Documentation

(1) The department will require the lowest responsible bidder to submit documentation to be placed in escrow at a document storage facility. Bid Escrow Documentation (BED) consists of writings, working papers, computer printouts, charts, and data compilations that contain or reflect information, data, calculations, or assumptions used by the bidder to determine the proposal submitted. If the apparent low bid is withdrawn or rejected, the second low bidder will provide the required documents as specified in this special provision within 72 hours of written notification by the department.

(2) The BED shall clearly itemize the contractor's estimated costs of performing the scope of work defined in the contract.

(3) The BED shall include, but not be limited to, all quantity takeoffs, rate schedules for the direct costs of craft labor, construction (expendable materials), construction equipment ownership costs, construction equipment operating costs, permanent materials subcontractors and insurance. Also include development of rates of production including, where appropriate: estimate of crews, construction materials, construction equipment, and construction sequence and duration. Submit the BED for each subcontractor whose total subcontract costs exceed $500,000.

(4) Identify the allocation of construction plant and equipment, time and non-time related indirect costs (including if applicable joint venture fees), home office overhead, contingencies and margin applicable to each bid item. Further, documentation shall include consultant's reports, final estimate adjustment calculations, and all other information used by bidders to arrive at the estimate.

(5) All manuals standard to the industry used by the bidder in determining the proposal are also considered part of the BED. These manuals may be included in the proposal documentation by reference and shall show the name and date of the publication and the publisher.

(6) It is not necessary to include documents provided by the department for the bidder's use in the preparation of the proposal.

(7) The low bidder shall present authentic copies of their BED at the department's office, located at the project field office by 3 days after let, at 10:00 AM.

(8) At the time of submittal, only designated representatives of the apparent low bidder and the department will jointly examine the apparent low bidder's bid documentation to determine if it is authentic, legible, and generally meets the requirements of this special provision. The department will not share the BED information with, or in any other way divulge the contents of, the apparent low bidder's BED to, their subcontractors or any other party.

(9) The department, if requested by apparent low-bidder subcontractors, will also independently examine the BED submitted by the apparent low bidder's subcontractors in the same manner as the apparent low bidder's BED was examined. Only designated representatives of the individual subcontractor and the department will be present during this examination. The department will not share the BED information with, or in any other way divulge the contents of, a subcontractor's BED to, the apparent low bidder or any other party.

(10) The department's examination of the BED will not include review of, nor will it constitute approval of, proposed construction methods, estimating assumptions, or interpretation of the contract. The examination will not alter any conditions or terms of the contract. The department will determine if the BED complies with this special provision within 4 hours after the time the BED is submitted. If the BED does not meet the requirements of this special provision, the department may reject the bid.

(11) If the BED of the apparent low bidder meets the requirements of this special provision, the department and bidder will jointly deposit the BED at an agreed document storage facility. Place the BED in a sealed envelope or container clearly marked with the bidder's name and address, date of submittal, project name and identification number. Representatives of the department and the bidder will deliver all bid escrow documentation and the original affidavit directly to a document storage facility, to be placed in escrow.

(12) If the apparent low bid is withdrawn or rejected, the designated representative of the second low bidder and the department will examine and inventory the bid documentation of the second low bidder and their subcontractors in the manner specified in this section, then seal and deposit in escrow. If a subcontractor with a subcontract exceeding $500,000 is replaced, the contractor shall submit new BED for examination and escrow before the engineer will authorize the substitution.

(13) The department will pay for the costs of the escrow document storage facility and will provide escrow instructions to the document facility consistent with this special provision.

(14) The department acknowledges that the bidder considers that the BED constitutes trade secrets or proprietary information. This acknowledgment is based upon department's understanding that the information contained in the BED is not known outside each bidder's business, is known only to a limited extent and by a limited number of employees of bidder, is safeguarded while in bidder's possession, and may be valuable to bidder's construction strategies, assumptions and intended means, methods and techniques of design and construction. Except as set forth in the contract or as required by applicable Law, the department acknowledges that the BED will always remain in the possession of the Escrow Agent and will at no time be received by, or become the property of, the department.

(15) Submit a copy of the affidavit in this special provision, signed under oath before a Notary Public by a representative of the bidder authorized to execute proposals. Department representatives will sign the affidavit after reviewing the BED.

(16) The BED will remain in escrow until one or more of the following occurs:

1. The bidder and the department mutually agree to release of the BED;

2. A court orders the department to provide the BED;

3. A dispute is referred to the Dispute Review Board or claims review panel; or

4. Either party seeks judicial review of a dispute.

(17) If any of the events numbered 1-4 in this section occurs, the department will take possession of all relevant portions of the BED, as determined by the department, until complete resolution of the issue for which the request was made or the court order was issued. In absence of these actions, and provided the bidder signs an appropriate release, the unopened BED will be released to the bidder upon final acceptance and the expiration of all warranty periods provided by this contract.

BID ESCROW DOCUMENTATION CERTIFICATION

Using this BID ESCROW DOCUMENTATION CERTIFICATION, the bidder certifies that the material submitted in this special provision constitutes all the documentary information used in preparation of the bid and that said bidder has fully examined the contents of the container and that they are complete. The undersigned Wisconsin Department of Transportation representatives have reviewed the BED for compliance.

BIDDER Witness

(Name of Bidder) (Name of Witness)

By: By:

(Signature\*) (Signature\*)

Title Date:

Date

WISCONSIN DOT WISCONSIN DOT

(Name of Department Representative) (Name of Department Representative)

By: By:

(Signature\*) (Signature\*)

Title Title:

Date Date:

(END OF BID ESCROW DOCUMENTS)

103.10 Mobilization Workshops

103.10.1 Workshop Schedule

(1) After contract award, attend the following workshops. Each workshop is described within this special provision and will include the following topics:

1. Project Kickoff and Initial Work Plan

2. Cost Reduction Incentives

3. Utility Coordination

4. Submittals

5. CPM Scheduling

6. Leadership Partnering (Initial Session)

7. (Vacant)

8. Storm Sewer Tunneling

9. Work Force Opportunities

10. Incident Crisis Communications Plan

11. Notice to Proceed

(2) The workshop dates will be scheduled after contract award.

(3) If necessary, the engineer may modify the workshop schedule to ensure attendance by the necessary department and contractor personnel; however, all workshops will be completed before issuing the Notice to Proceed.

103.10.2 Workshops

103.10.2.1 Project Kickoff and Initial Work Plan

103.10.2.1.1 General

(1) The Project Kickoff and Initial Work Plan Workshop will provide a forum to discuss and answer questions relative to the proposal, bid schedule, and other questions in the Project Questionnaire described in standard spec 103.10.2.1.2. The Initial Work Plan Workshop will include:

1. Contractor responses to the attached Project Questionnaire.

2. Department presentation of the use of CPM scheduling on the project and presentation of the department's Master Schedule to the contractor.

3. Contractor presentation of its conceptual work plan for the project.

4. Department and contractor discussion of the level of detail and features in the Initial Work Plan and the Baseline CPM Progress Schedule.

103.10.2.1.2 Project Questionnaire

(1) Provide the following information in the order shown in this special provision. This information will constitute the "Project Questionnaire."

General Information

If a Joint Venture, provide information for each member of the Joint Venture.

Provide the following information about the company:

* Firm Name
* Address
* Telephone and facsimile numbers; e-mail address
* Contracting Specialties
* Years performing work in contracting specialties
* Geographic areas served
* Total Management Employees and years of service
* Project Managers
* General Superintendents
* Craft Superintendents
* Engineers
* Estimators
* CPM Schedulers

Construction Engineering

Provide/attach a copy of your Construction Project Manager's resume indicating the manager's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).

Provide (if applicable) your third-party construction engineering firms.

Provide plan for Construction surveying.

Subcontractors

Attach the list of all subcontractors that are intended for this Project and the items of work they shall perform.

Permanent Material Suppliers

Attach the list of all permanent material suppliers that are intended for the project.

Quality Control (where applicable)

Provide the name of your Construction Quality Control firm and qualifications indicating the firms' experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).

Provide/attach a copy of your Construction Quality Control Manager's resume indicating the manager's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).

List the major elements and Table of Contents of your Construction Quality Management Program (QMP).

Provide the name of your Independent Quality Control Testing firm (Construction Quality Control Lab) and qualifications indicating the firm's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).

Organization Chart

Provide a functional and personnel Organization Chart showing the authority and responsibilities of each individual identified.

Work Rules

Provide the plan for hours per day, days per week, and number of shifts for key elements of work; i.e. sewer tunnels, retaining wall construction, roadway excavation, bridge structures, and roadway structural section activities.

Maintenance of Traffic

Provide the name of your Traffic Control Manager and qualifications indicating the firm's experience in similar major construction projects. The resume shall include similar projects with references. (Note: references are only for verification of work scope performed).

Include an outline of your approach to the maintenance of traffic and how you shall stage the construction to meet the substantial completion schedule including planned locations for local street and freeway access into and out of the work zones for each stage of construction.

Attach a copy of your Preliminary Schedule indicating your approach to achieving the substantial completion schedule.

Construction

Provide the approach (type of equipment, number of crews, and where required ground support systems) for the following activities.

* Retaining wall construction by type of work
* Bridge demolition
* Roadway structural section
* Roadway excavation
* Office and yard facilities

103.10.2.2 Cost Reduction Incentives

(1) The Cost Reduction workshop will identify value enhancing opportunities and consider modifications to the plans and specifications that will reduce either the total cost, time of construction, or traffic congestion. These modifications shall not impair the essential functions or characteristics of the project. These include:

* Service life
* Economy of operation
* Ease of maintenance
* Benefits to the traveling public
* Desired appearance
* Design and safety standards

(2) Submit recommendations resulting from the workshop for approval by the engineer as cost reduction incentive proposals in conformance with standard spec 104.10 "Cost Reduction Incentive".

(3) The department and the contractor may be able to complete the CRI Concept process, as specified in standard spec 104.10.2, during the CRI workshop.

(4) Submit CRIs after the CRI workshop that were not introduced at the CRI workshop.

103.10.2.3 Utility Coordination

(1) The Utility Coordination Workshop will define the scope and schedule of utility relocation work and the corresponding roles and responsibilities of the project team.

1. At a minimum, the following key personnel will attend the Utility Coordination Meeting.

1.1. Department's Utility Coordinator.

1.2. Contractor's Utility Coordinator.

1.3. Designer Team's Utility Coordinator.

1.4. Key Utility Company Representative(s)

1. At a minimum, the Utility Coordination Meeting will include a review of the following:

2.1. Summary of all required utility relocations on the project.

2.2. Special provisions addressing utility work.

2.3. Sharing of contact information.

2.4. Scheduling of work for utility relocation including critical milestones and staging for the work.

103.10.2.4 Submittals

(1) The Submittal Workshop will identify the key required submittals for the project, categorize submittals into functional areas, and develop a schedule for submittals and submittal reviews. The Workshop participants will at a minimum:

1. Review the project special provisions.
2. Categorize submittals into functional areas including:

2.1 MSE Retaining Walls

2.2 Temporary Shoring

2.3 Falsework and Formwork

2.4 Girder Shop Drawings

2.5 Steel Transportation, Delivery and Erection

2.6 Structure Demolition Plans

2.7 Pile Hammers and High Capacity Piling

2.8 Concrete/ Asphalt

2.9 Materials

2.10 ITS / Lighting

2.11 Traffic Signals

2.12 Sanitary Sewer and Water

2.13 Permits

1. Develop a schedule for submittals.

103.10.2.5 CPM Schedule

*See specification Baseline CPM Progress Schedule.*

103.10.2.6 Leadership Partnering Meetings B-Weekly

The department will implement mandatory bi-weekly leadership partnering meetings. Unless the department and contractor agree otherwise, the contractor management level personnel, project design engineers, project level supervisory personnel, and department management level personal shall meet bi-weekly from project start until the contractor accepts the tentative final estimate. The contractor and department may also invite the following as needed:

* FHWA
* Key project personnel of the contractor’s principal subcontractors and suppliers
* Local government representatives
* Environmental regulators
* Emergency service personnel
* Utility companies
* Impacted business and property owners
* Other stakeholders

This meeting will facilitate a cooperative team environment that clearly defines roles and responsibilities, determines common goals and objectives, and provides a platform to build trust and accountability. Meeting topics may include:

* Issue and risk management
* Dispute resolution procedures
* Safety
* Public outreach
* Traffic management
* Cost reducing incentives
* Claim resolution
* Scheduling issues
* Quality control

All mobilization workshop costs are incidental to the contract work.

sef-108-030 (20171004)

103.10.2.7 (Vacant)

103.10.2.8 Storm Sewer Tunneling

(1) The Storm Sewer Tunneling workshop will focus on the installation plan, access, material storage, scheduling, dewatering, shoring, maintaining existing drainage, erosion control, and subsequent work operations associated with the construction.

103.10.2.9 Work Force Opportunities

After contract award, attend the Work Force Opportunities workshop. The workshop will take place on the same day and in the same location as the pre-construction meeting.

The Work Force Opportunities workshop will provide a venue for contractors to have meaningful dialogue with Transportation Alliance for New Solutions (TrANS) providers regarding the hiring of TrANS graduates. Reference ASP-1 for additional information regarding TrANS. The prime contractor and the nine largest subcontractors according to let value of work shall provide staff with hiring authority to participate in a job-matching session during this workshop. Workshop participants will, at a minimum:

* Review contractor hiring processes for general labor positions.
* Listen to a presentation provided by TrANS providers regarding the TrANS training program, including details regarding how contractors can hire TrANS graduates.
* Review TrANS graduate availability for working on the project.
* Meet one-on-one for two minutes with each TrANS graduate in attendance at the meeting.

sef-108-036 (20180104)

103.10.2.10 Incident Crisis Communications Plan

(1) The Incident Crisis Communications Plan workshop will include a "dry run" of the Crisis Communication Plan to coordinate the response to an incident within the work zone or on the freeway by the contractor, Police, Fire, EMS and other responders. Ensure that representatives of subcontractors also participate in this meeting if requested by the engineer.

103.10.2.11 Notice to Proceed

(1) After all workshops are completed, the Notice to Proceed will be issued.

sef-103-005 (20180104)

1. 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 subparagraph (3), no person may do any of the following:

1. Import a regulated item under sub. (2) into this state if that item originates from an emerald ash borer regulated area identified in 7CFR 301.53-3.
2. Move any regulated item under sub. (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.

1. **Regulated Items**. The following are regulated items for purposes of subparagraph
2. The emerald ash borer, Agrilus planipennis Fairmaire in any living stage.
3. Ash trees.
4. Ash limbs, branches, and roots.
5. Ash logs, slabs or untreated lumber with bark attached.
6. Cut firewood of all non-coniferous species.
7. Ash chips and ash bark fragments (both composted and uncomposted) larger than one inch in diameter.
8. Any other item or substance that may be designated as a regulated item if a DATCP 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.
9. **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:

1. Inspects the regulated item.
2. 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**

1. The quarantine means that ash wood products may not be transported out of the quarantined area.
2. 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**

1. 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.
2. May be buried on site within the right-of-way according to standard spec 201.3 (14).
3. May be buried on adjacent properties to projects within the quarantined zone with prior approval of the engineer according to standard spec 201.3 (15).
4. May be trucked to a licensed landfill within the quarantined zone with the engineer’s approval according to standard spec 201.3 (15).
5. Burning chips is optional if in compliance with standard spec 201.3.
6. 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.
7. Chipper equipment must be cleaned following post-chipping activities to ensure no spread of wood chip debris into non-quarantined counties.

**Ash logs, Branches, and Roots**

1. May be buried without chipping within the existing right-of-way or on adjacent properties according to standard spec 201.3 (14)(15).
2. May be trucked to a licensed landfill within the quarantined zone with the engineer’s approval according to standard spec 201.3 (15).
3. Burning is optional if in compliance with standard spec 201.3.
4. Ash logs, branches, and roots must be disposed of immediately and may not stockpiled.
5. All additional costs will be incidental to clearing and grubbing items.
6. Do not bury or use mulch in an area that will be disturbed again during later phases of the project.
7. 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 (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.

**Updates for Compliance**

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 of Agriculture, Trade, and Consumer Protection (DATCP) website at [**www.datcp.state.wi.us**](http://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 DATCP. Persons may request update notices by calling **(608) 224−4573**, by visiting the DATCP 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

**Regulated Items**

More frequent updates, if any, are available on the DATCP website at [**www.datcp.state.wi.us**](http://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 DATCP. Persons may request update notices by calling (608) 224−4573, by visiting the DATCP website, or by writing to the above address.

SER-201.1 (20160808)

1. Removing Old Structure Over Waterway With Minimal Debris Station 55+50, Item 203.0600.S.01.

Conform to standard spec 203 as modified in this special provision.

*Add the following to standard spec 203:*

**203.3.6 Removals Over Waterways and Wetlands**

**203.3.6.2 Removing Old Structure Over Waterway with Minimal Debris**

(1) Remove the existing Structure B-67-38 over the Pebble Creek in large sections and conforming to the contractor’s approved structure removal and clean-up plan. During superstructure removal, prevent all large pieces and minimize the number of small pieces from entering the waterway or wetland. Remove all reinforcing steel, all concrete, and all other debris that falls into the waterway or wetland. The contractor may leave limited amounts of small concrete pieces scattered over the waterway floor or wetland only if the engineer allows.

(2) Submit a structure removal and clean-up plan as part of the erosion control implementation plan required under standard spec 107.20. Do not start work under the structure removal and clean-up plan without the department’s written approval of the plan. Include the following information in the structure removal and clean-up plan:

* Methods and schedule to remove the structure.
* Methods to control potentially harmful environmental impacts.
* Methods for superstructure removal that prevent all large pieces and minimize the number of small pieces from entering the waterway or wetlands.
* Methods to control dust and contain slurry.
* Methods for removing piers and abutments. If blasting in water, include restrictions that regulatory agencies and the contract require.
* Methods for cleaning the waterway or wetlands.

(3) If stockpiling spoil material, place it on an upland site an adequate distance from the waterway, wetland, or any open water created by excavation. Install silt fence between the spoil pile and the waterway, wetland, or excavation site.

*Add the following Removing Old Structure bid item to standard spec 203.5.1:*

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 203.0600.S.01 | Removing Old Structure Over Waterway With Minimal Debris Station 55+50 | LS |

203-020 (20170615)

1. Abandoning Sewer, Item 204.0291.S.

**A Description**

This special provision describes abandoning existing sewer by filling it with cellular concrete according to the pertinent requirements of standard spec 204 and standard spec 501, as shown in the plans, and as hereinafter provided.

**B Materials**

Provide cellular concrete meeting the following specifications: 1 part cement, 1 part fly ash, 8 parts sand, or an approved equal, and water. Provide cement meeting the requirements of standard spec 501.2.1 for Type 1 Portland Cement. Provide sand meeting the requirements of standard spec 501.2.5.3 Provide water meeting the requirements of standard spec 501.2.4.

**C Construction**

Fill the abandoned sewer pipe with cellular concrete as directed by the engineer. In the event that the sewer cannot be completely filled from existing manholes, tap the sewer where necessary and fill from these locations.

**D Measurement**

The department will measure Abandoning Sewer in volume by the cubic yard according to standard spec 109.1.3.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 204.0291.S | Abandoning Sewer | CY |

Payment is full compensation for furnishing all materials and excavating and backfilling where necessary.

204-050 (20080902)

1. Removing Modular Block Retaining Wall, Item 204.9090.S.01.

**A Description**

This special provision describes removing modular block retaining wall from the northwest corner of Madison Street and Merrill Hills Road according to the pertinent provisions of standard spec 204, as shown in the plans and as hereinafter provided.

**B (Vacant)**

**C Construction**

Remove all plastic sheeting, fabric, pipe underdrain, reinforcing grids or tie-backs that abut or underlie the portion of the existing modular block retaining wall to be removed in a manner that will not impact the structural stability or functionality of the portion of the retaining wall to remain in place.

If the contractor damages the blocks of any portion of the retaining wall to remain through its own operations then the contractor shall replace them at no additional expense to the department.

**D Measurement**

The department will measure Removing Modular Block Retaining Wall by the linear foot of removed modular block retaining wall, 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 |
| 204.9090.S.01 | Removing Modular Block Retaining Wall | LF |

Payment is full compensation for excavating, modular block wall removal, and disposal of surplus wall materials.

1. Removing Traffic Signals and Lighting Intersection of STH 59 and CTH X/Saylesville Rd, Item 204.9105.S.01.

**A Description**

This special provision describes removing existing traffic signals and lighting at the intersection of STH 59 and CTH X according to the pertinent provisions of standard spec 204 and as hereinafter provided. Specific removal items are noted in the plans.

**B (Vacant)**

**C Construction**

Arrange for the de-energizing of the traffic signals with the local electrical utility after receiving approval from the engineer that the existing traffic signals can be removed.

Notify the department’s Electrical Field Unit at (414) 266-1170 at least five working days prior to the removal of the traffic signals and lights. Complete the removal work as soon as possible following shut down of this equipment.

The department assumes that all equipment is in good condition and in working order prior to the contractor’s removal operation. Prior to removal, inspect and provide a list of any damaged or non-working traffic signal equipment to the engineer. Any equipment not identified as damaged or not working, prior to removal, will be replaced by the contractor at no cost to the department.

Remove all standards and poles per plan from their concrete footings and disassemble out of traffic. Remove the transformer bases from each pole. Remove the signal heads, emergency vehicle pre-emption (EVP) heads, mast arms, luminaires, lamps, wiring/cabling, and traffic signal mounting devices from each signal standard, arm or pole. Ensure that all access hand-hole doors and all associated hardware remain intact.

Dispose of the underground signal cable, internal wires and street lighting cable off the state right-of-way. Dispose of the HID (metal halide, mercury vapor and high-pressure sodium) lamps according to all environmental regulations.

Deliver the remaining materials to the West Allis Electrical Service Facility at 935 South 60th Street, West Allis, Milwaukee County. Contact the department’s Electrical Field Unit at (414) 266-1170 at least five working days prior to delivery to make arrangements.

Department forces will remove the signal cabinet from the footing. The signal cabinet and associated signal cabinet equipment will be removed from the site by department forces and will remain the property of the department.

**D Measurement**

The department will measure Remove Traffic Signals and Lighting Intersection of STH 59 and CTH X/Saylesville Rd as a single lump sum unit of work for each intersection, acceptably completed.

**E Payment**

*Add the following to standard spec 204.5:*

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 204.9105.S.01 | Remove Traffic Signals and Lights Intersection of STH 59 and CTH X/Saylesville Rd | LS |

SER-204.5 (Revised)

1. Excavation, Hauling, and Disposal of Petroleum Contaminated Soil, Item 205.0501.S.

**A Description**

**A.1 General**

This special provision describes excavating, loading, hauling, and disposing of petroleum contaminated soil at a DNR approved bioremediation facility. The closest DNR approved bioremediation facilities are:

Advanced Disposal Emerald Park Landfill

W124 S10629 124th Street

Muskego, WI 53150

(414) 529-1360

Waste Management Metro Landfill

10712 South 124th Street

Franklin, WI 53132

(414) 529-6180

Perform this work according to standard spec 205 and with pertinent parts of Chapters NR 700-754 of the Wisconsin Administrative Code, as supplemented herein. Per NR 718.07, a solid waste collection and transportation service-operating license is required under NR 502.06 for each vehicle used to transport contaminated soil.

**A.2 Notice to the Contractor – Contaminated Soil Location(s)**

The department completed testing for soil contamination for locations within this project where excavation is required. Testing indicated that petroleum-contaminated soil is present at the following location(s) as shown on the plans:

* Glacial Drumlin State Trail western area (Area 1), as shown on the project plans, approximately Station 45+80 to Station 49+30 10 feet to 15 feet LT and RT of the reference line, from 0’ to approximately 2’ below the ground surface elevation of the trail. Soil contains low-level PVOCs, sporadic pieces of slag, and somewhat elevated arsenic concentrations and must be managed. Approximately 425 cubic yards (approximately 725 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this location for grading and construction of the trail underpass. Dewatering may be required as necessary to facilitate Trail underpass construction as discussed further below.
* Glacial Drumlin State Trail central area (Area 2), as shown on the project plans, approximately Station 49+30 to Station 50+35 15 feet to 20 feet LT and RT of the reference line, from 0’ to approximately 8’ below the ground surface elevation of the Trail. Soil contains low-level PVOCs, sporadic pieces of slag, and somewhat elevated arsenic concentrations and must be managed. Approximately 1,920 cubic yards (approximately 3,275 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this location for grading and construction of the Trail underpass. Dewatering may be required as necessary to facilitate Trail underpass construction as discussed further below.
* Glacial Drumlin State Trail eastern area (Area 3), as shown on the project plans, approximately Station 50+35 to Station 54+80 10 feet to 15 feet LT and RT of the reference line, from 0’ to approximately 4’ below the ground surface elevation of the Trail. Soil contains low-level PVOCs, sporadic pieces of slag, and somewhat elevated arsenic and lead concentrations and must be managed. Approximately 495 cubic yards (approximately 850 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this location for grading and construction of the Trail underpass. Dewatering may be required as necessary to facilitate Trail underpass construction as discussed further below.
* Wisconsin and Southern Railroad northern area (Area 4), as shown on the project plans, approximately Station 174+15 to Station 174+40 55 feet LT to 140 feet RT of the reference line, from 0’ to approximately 2’ below the ground surface elevation of the railroad tracks. Soil contains low-level petroleum volatile organic compounds (PVOCs), sporadic pieces of slag, and somewhat elevated arsenic concentrations and must be managed. Approximately 225 cubic yards (approximately 400 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this location for grading.
* Wisconsin and Southern Railroad southern area (Area 5), as shown on the project plans, Station 173+55 to Station 173+80 80 feet LT to 115 feet RT of the reference line, from 0’ to approximately 2’ below the ground surface elevation of the railroad tracks. Soil contains low-level petroleum volatile organic compounds (PVOCs), sporadic pieces of slag, and somewhat elevated arsenic, cadmium and lead concentrations and must be managed. Approximately 210 cubic yards (approximately 350 tons at an estimated 1.7 tons per cubic yard) of soil will be excavated from this location for grading.

Directly load soil excavated by the project at the above location into a truck that will transport the soil to a WDNR-licensed landfill facility.

If contaminated soils are encountered elsewhere on the project, terminate excavation activities in the area and notify the engineer.

For further information regarding previous investigation and remediation activities at these sites contact:

Name: Mr. Andrew Malsom

Address: 141 NW Barstow Street, PO Box 798, Waukesha, WI 53187-0798

Phone: (262) 548-6705

Fax: (262) 548-6891

E-mail: [Andrew.Malsom@dot.wi.gov](mailto:Andrew.Malsom@dot.wi.gov)

**A.3 Coordination**

Coordinate work under this contract with the environment consultant:

Consultant: Natural Resource Technology (NRT)

Address: 234 W. Florida Street, Fifth Floor, Milwaukee, WI 53204

Contact: Mr. Ken Yass, PE, CHMM

Phone: (414) 837-3637

Fax: (414) 837-3608

E-mail: [kyass@naturalrt.com](mailto:kyass@naturalrt.com)

The role of the environmental consultant will be limited to:

1. Determining the location and limits of contaminated soil to be excavated based on soil analytical results from previous investigations, visual observations, and field screening of soil that is excavated.

2. Identifying contaminated soils to be hauled to the bioremediation facility.

3. Documenting that activities associated with management of contaminated soil are in conformance with the contaminated soil management methods for this project as specified herein.

4. Obtaining the necessary approvals for disposal of contaminated soil from the bioremediation facility.

5. Providing contractor with groundwater sampling results to facilitate contractor’s coordination of approvals with the WDNR for groundwater management as discussed further below.

Provide at least a 14-calendar day notice of the preconstruction conference date to the environmental consultant. At the preconstruction conference, provide a schedule for all excavation activities in the areas of contamination to the environmental consultant. Also notify the environmental consultant at least three calendar days prior to commencement of excavation activities in each of the contaminated areas.

Coordinate with the environmental consultant to ensure that the environmental consultant is present during excavation activities in the contaminated areas. Perform excavation work in each of the contaminated areas on a continuous basis until excavation work is completed.

Identify the DNR approved bioremediation facility that will be used for bioremediation and/or disposal of contaminated soils, and provide this information to the environmental consultant no later than 30 calendar days prior to commencement of excavation activities in the contaminated areas or at the preconstruction conference, whichever comes first. The environmental consultant will be responsible for obtaining the necessary approvals for bioremediation and/or disposal of contaminated soils from the bioremediation facility. Do not transport contaminated soil offsite without prior approval from the environmental consultant.

Contractor shall be responsible for obtaining the necessary WDNR approvals and coordinating discharge of water to Pebble Creek under the WDNR’s Wisconsin Pollutant Discharge Elimination System (WPDES) General Permit for Contaminated Groundwater from Remedial Action Operations (Chapter 283, Wis. Statutes – WPDES Permit No. WI-0046566-6).

**A.4 Health and Safety Requirements**

*Supplement standard spec 107.1 with the following:*

During excavation activities, expect to encounter soil contaminated with low-level metals (arsenic, cadmium and lead) and petroleum contamination and water contaminated with low-level metals (arsenic and lead). Site workers taking part in activities that will result in the reasonable probability of exposure to safety and health hazards associated with hazardous materials shall have completed health and safety training that meets the Occupational Safety and Health Administration (OSHA) requirements for Hazardous Waste Operations and Emergency Response (HAZWOPER), as provided in 29 CFR 1910.120.

Prepare a site-specific Health and Safety Plan, and develop, delineate and enforce the health and safety exclusion zones for each contaminated site location as required by 29 CFR 1910.120. Submit the site-specific health and safety plan and written documentation of up-to-date OSHA training to the engineer prior to the start of work.

**B (Vacant)**

**C Construction**

*Add the following to standard spec 205.3:*

Control operations in the contaminated areas to minimize the quantity of contaminated soil excavated and contaminated water pumped.

The environmental consultant will periodically evaluate soil excavated from the contaminated areas to determine if the soil will require offsite bioremediation. The environmental consultant will evaluate excavated soil based on field screening results, visual observations, and soil analytical results from previous environmental investigations. Assist the environmental consultant in collecting soil samples for evaluation using excavation equipment. The sampling frequency shall be a maximum of one sample for every 15 cubic yards excavated.

Directly load and haul soils designated by the environmental consultant for offsite bioremediation to the DNR approved bioremediation facility. Use loading and hauling practices that are appropriate to prevent any spills or releases of petroleum-contaminated soils or residues. Prior to transport, sufficiently dewater soils designated for off-site bioremediation so as not to contain free liquids.

Testing by the department has indicated that the depth to groundwater is approximately nine feet below grade, which is shallower than the planned maximum excavation depth of 12 feet below grade at the time of the Phase 2.5 investigation. Therefore, dewatering of groundwater may be required to facilitate Trail underpass construction. Water generated during construction will require proper handling and discharge. Water is anticipated to be permitted to discharge to Pebble Creek under the WDNR’s WPDES General Permit for Contaminated Groundwater from Remedial Action Operations (Chapter 283, Wis. Statutes – WPDES Permit No. WI-0046566-6). Contractor shall perform all necessary monitoring to document compliance with the requirements of this permit and the WDNR. Furnish, install, operate, maintain, disassemble, and remove any treatment equipment that may be necessary to comply with the requirements of the WPDES permit and the WDNR.

Grit (such as sand, sediment, detritus, etc.) will be removed from water prior to direct discharge to Pebble Creek.

Provide, operate, and maintain adequate pumping and water storage equipment. Notify the engineer of any discharge activities, and obtain any permits necessary to discharge water. Provide copies of such permits to the engineer. Meet any requirements and pay any costs for obtaining and complying with such permit use. Follow all applicable legislative statutes, judiciary decisions, and regulations of the State of Wisconsin.

The environmental consultant may periodically evaluate water pumped during construction activities. Assist the environmental consultant in collecting water samples.

If necessary, water generated during construction can be pumped into temporary holding tanks provided by the contractor in order to complete construction. The contractor shall coordinate holding tank mobilizations and transportation/discharge of water. The cost for holding tank mobilization, transportation, and water discharge will be paid by the contractor.

Sediment associated with dewatering activities shall be containerized and tested by the environmental consultant for waste characterization purposes. The environmental consultant shall coordinate approval for disposal of the sediment. Contractor shall not haul sediment to an approved landfill for disposal without specific approval from the environmental consultant.

**D Measurement**

The department will measure Excavation, Hauling, and Disposal of Petroleum Contaminated Soil in tons of contaminated soil, accepted by the bioremediation facility as documented by weight tickets generated by the bioremediation facility.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 205.0501.S | Excavation, Hauling, and Disposal of Petroleum Contaminated Soil | TON |

Payment is full compensation for excavating, segregating, loading, hauling, and disposal of contaminated soil; obtaining solid waste collection and transportation service operating licenses; assisting in the collection soil samples for field evaluation; and dewatering of soils prior to transport, if necessary. Management and discharge of low-level metals contaminated water is considered incidental to other bid items in the contract. The department will not pay directly for management and discharge of low-level metals contaminated water.

1. QMP Subgrade.

**A Description**

This special provision describes requirements for subgrade materials within the roadway foundation as defined in standard spec 101.3. Conform to standard spec 207 as modified in this special provision for all work within the roadway foundation at the following locations:

Waukesha Bypass (Genesee Road to Fiddlers Creek Drive), USH 18, Mainline, Cross Roads, and local roads

Provide and maintain a quality control program. A quality control program is defined as all activities, including process control inspection, sampling and testing, documentation, and necessary adjustments in the process that are related to the construction of subgrade which meets all the requirements of this provision.

Chapter 8 of the department’s construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes sampling and testing procedures. The contractor may obtain the CMM from the department’s web site at:

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/rdwy/cmm.aspx>

**B Materials**

**B.1 Quality Control Plan**

Submit a comprehensive written quality control plan to the engineer at or before the pre‑construction meeting. Do not perform grading 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. 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. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.
4. Location of the QC laboratory, retained sample storage, and control charts and other documentation.
5. A summary of the locations and calculated quantities to be tested under this provision.
6. An explanation regarding the basis of acceptance for material that cannot be tested by nuclear methods due to a high percentage of oversized particles.

**B.2 Personnel**

Perform the quality control sampling, testing, and documentation required under this provision using HTCP certified technicians. Have a grading technician certified under HTCP at level I (or ACT Grading Technician under the direction of a certified technician) present at the site during all subgrade preparation, fill placement, compaction, and nuclear testing activities. Have a nuclear density technician certified under HTCP at level I perform field density and field moisture content testing.

**B.3 Laboratory**

Perform quality control testing in a department-qualified laboratory. Obtain information on the Wisconsin laboratory qualification program from:

Materials Laboratory

3502 Kinsman Boulevard

Madison, Wisconsin 53704-2583

Telephone: (608) 246-7938

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/appr-prod/qual-lab-req.aspx>

**B.4 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://www.atwoodsystems.com/materials>.

Ensure that the gauge manufacturer or an approved calibration service calibrates the gauge within 12 months before using it on the project. Retain a copy of the calibration certificate with the gauge. Nuclear density gauge calibration verification is required daily when earthwork construction operations require testing under this special provision article. This calibration verification shall be performed using the departments “Validator” apparatus which is located at the Zoo Interchange Construction Field Office: 2424 S. 102nd St., West Allis, Wisconsin 53227. Establish a standard gauge reading for the “Validator” using the ten test average method. The source emitter depth for calibration verification, in the direct transmission mode, will be determined by the engineer. This procedure will establish the “Validator” apparatus, as the contractor’s project reference site.

Conform to ASTM D 2950 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.

**B.5 Soil Source Study**

Conduct and submit a soil source study before beginning of grading operations. Ensure that this study identifies each distinct soil type on the project within the top 15 feet of cut areas and all borrow material. Provide the in-bank natural moisture content for each soil. Develop moisture-density curves for each identified soil type by utilizing AASHTO T 99, with a minimum of 5 individual points, and a zero air voids curve at a specific gravity of 2.65. If a different specific gravity is used perform a specific gravity test. Determine the maximum density and corresponding optimum moisture level for each soil type. Develop a site-specific family of Proctor curves for this contract from the completed soil source study and submit to the engineer for review and acceptance.

Perform characterization tests on each of the soil types selected for the soil source study. The tests for roadway include AASHTO T 89, AASHTO T 90, AASHTO T 27, and AASHTO T 11. Classify each soil type selected according to the AASHTO soil classification system based on the characterization tests. Do not begin grading operations until the engineer accepts the soil source study.

Use the soil types identified in the soil source study with corresponding maximum densities and optimum moisture values to determine the compaction compliance on the project. Continue the soil source study in those areas of cuts greater than 15 feet that were not accessible during the initial study. Include data on additional soil types if project conditions change. Ensure that tests of additional soil types are complete and the engineer accepts the results before incorporating the material into the roadway foundation.

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 at:

Regional Materials Laboratory

Attn: Paul Emmons

935 S. 60th Street

West Allis, Wisconsin 53214

Telephone: (414) 266-1158

Retain and identify two representative samples of each Proctor. Submit one sample to the engineer. Retain one sample on site for use when performing textural identification.

**B.6 Quality Control Documentation**

**B.6.1 Control Charts**

Maintain separate control charts for the field density and field moisture content of each grading area. Designate grading areas within the project as follows:

1. Embankment portions of the project, except within 200 feet of bridge abutments.
2. Embankment within 200 feet of bridge abutments.
3. Subgrade cut portions of the project.
4. Embankment in pipe removal, pipe culvert, sewer and waterline trenches.
5. Structure and granular backfill placed at bridge abutments.
6. Embankments of the project where embankments are 20 feet or higher regardless of location to be known as special compaction area.

Ensure that all tests are recorded and become part of the project records. Plot required test results on the control charts. Include random and engineer-requested testing but only include the contractor’s randomly selected QC test results in the 4-point running average. The contractor may plot other contractor-performed process control or informational tests on the control charts, but do not include them in 4‑point running averages.

Post control charts in an engineer-approved location and update daily. Ensure that the control charts include the project number, the test number, each test element, the applicable control limits, the contractor’s individual test results, the running average of the last 4 data points, and the engineer’s quality verification test data points. Use the control charts as part of a process control system for identifying potential problems and assignable causes. Format control charts according to the CMM.

Submit control charts to the engineer in a neat and orderly manner within 10 business days after completing subgrade construction.

**B.6.2 Records**

Document all observations, inspection records, adjustments to fill placement procedures, soil changes, and test results daily. Note the results of the observations and inspection records as they occur in a permanent field record. Density test locations shall be identified by a specific test number and include horizontal and vertical control for reference as noted in Section B.7.1.

Provide copies of the field density and field moisture running average calculation sheets, the one-point Proctor tests, records of procedure adjustments, and soil changes to the engineer daily.

Submit original testing records to the engineer in a neat and orderly manner within 10 business days after completing subgrade construction.

**B.7 Contractor Testing**

**B.7.1 General**

Have a grading technician certified under HTCP at level I (or ACT Grading Technician under the direction of a certified technician) present during all subgrade preparation, fill placement, compaction, and testing. Have a nuclear density technician certified under HTCP at level I perform the testing for field density and field moisture content. During subgrade construction, use sampling and testing methods identified in the CMM to perform the required tests at randomly selected locations at the indicated minimum frequency for each grading area.

Determine the cubic yards for testing based on a total load count system the engineer and contractor agree to.

For each test, provide the cubic yards represented and the test location to within 2 feet horizontally and 0.5 feet vertically. Use project stationing to determine horizontal location and grade stakes to determine vertical location. Elevations must be referenced to NAV88 datum.

Test areas of suspect compaction or areas which appear to be nonconforming as determined by the engineer.

**B.7.2 Field Density and Field Moisture**

Perform the field density and field moisture tests using the nuclear density meter method according to AASHTO T 310. Ensure that each field density test material is related to one of the specific soil types identified in the soil source study in determining the percent compaction. Use textural identification as the primary method of establishing this relationship. Utilize the representative samples retained from the soil source study when performing the textural identification. Use a coarse particle correction according to AASHTO T 224.

If field density and field moisture tests cannot be performed by the nuclear density method due to a high percentage of oversized particles as determined according to AASHTO T 99 for highway embankments, observe the placement of the embankment and document the basis of acceptance. Document daily quantities of untested embankment and locations where untested embankment is placed, and keep a cumulative quantity of untested embankment material for the duration of the project. Include the daily documentation and a summary of the cumulative quantity of untested embankment material with the project records.

**B.7.3 One-Point Proctor**

Obtain a representative sample of the fill material and test according to AASHTO T 272. Compare the sample to the curves developed in the soils source study to determine the maximum dry density and optimum moisture. Use the appendix for AASHTO T 272 as a guide in this determination.

**B.7.4 Testing Frequency**

**B.7.4.1 Subgrade Embankment portions of the project, except within 200 Feet of bridge abutments**

Perform the required tests at the following frequencies:

| Test | Minimum Frequency |
| --- | --- |
| Field Density and Moisture  (AASHTO T 310) | One per 2,000 cubic yards of fill per lift or one test per grading area per day whichever yields the most tests. |
| One-Point Proctor  (AASHTO T 272) | One per 9,000 cubic yards or when a change in fill material occurs. |

**B.7.4.2 Subgrade Embankment Within 200 Feet of Bridge Abutments**

Perform the required tests at the following frequencies:

| Test | Minimum Frequency |
| --- | --- |
| Field Density and Moisture  (AASHTO T 310) | One per 1,000 cubic yards of fill per lift or one test per grading area per day whichever yields the most tests. |
| One-Point Proctor  (AASHTO T 272) | One per 9,000 cubic yards or when a change in fill material occurs. |

**B.7.4.3 Subgrade Cut**

Perform the required tests at the following frequencies:

| Test | Minimum Frequency |
| --- | --- |
| Field Density and Moisture  (AASHTO T 310) | One test per 1,000 linear feet of cut or one test per cut area whichever yields the most tests. The testing will be completed at the finished subgrade elevation. |

**B.7.4.4 Subgrade Embankment in Pipe Removals, Pipe Culvert, Sewer and Waterline Trenches**

Perform the required tests at the following minimum frequencies per trench run between

structures. Test trenches individually at the frequency listed below. For example, lateral

lines and trunk lines are to be considered individual trenches:

| Test | Minimum Frequency |
| --- | --- |
| Field Density and Moisture  (AASHTO T 310) | One test per 100 CY of backfill placed per lift or one test per day whichever yields the most tests. |
| One-Point Proctor  (AASHTO T 272) | One per 3,000 cubic yards or when a change in fill material occurs. |

**B.7.4.5 Structure and Granular Backfill at Bridge Abutments**

Perform the required tests at the following minimum frequencies:

| Test | Minimum Frequency |
| --- | --- |
| Field Density and Moisture  (AASHTO T 310) | One test per 2 feet of vertical backfill height per abutment. |
| One-Point Proctor  (AASHTO T 272) | One per 3,000 cubic yards or when a change in fill material occurs. |

**B.7.4.6 Embankments of the project 20 feet or higherregardless of location to be known as special compaction area**

Perform the required tests at the following minimum frequencies but exclude MSE wall backfill:

| Test | Minimum Frequency |
| --- | --- |
| Field Density and Moisture  (AASHTO T 310) | One per 2,000 cubic yards of fill per lift or one test per grading area per day whichever yields the most tests. |
| One-Point Proctor  (AASHTO T 272) | One per 6,000 cubic yards or when a change in fill material occurs. |

**B.7.5 Compaction Zones**

**B.7.5.1 Subgrade Embankment portions of the project, except within 200 Feet of Bridge Abutments**

Embankment material placed within 6 feet of the finished subgrade elevation is classified as upper zone material. Material placed more than 6 feet below the finished subgrade elevation is classified as lower zone material.

**B.7.5.2 Subgrade Embankment Within 200 Feet of Bridge Abutments**

All embankment material placed within 200 feet of bridge abutments is subject to the quality controls for upper zone material.

**B.7.5.3 Subgrade Cut**

Subgrade material in cut areas is subject to the quality controls for upper zone material.

**B.7.5.4 Subgrade Embankment in Pipe Removal and Culvert Pipe Trenches**

Material placed within pipe removal and culvert pipe trenches are subject to the quality controls for the zone that the material is located in.

**B.7.5.5 Structure and Granular Backfill at Bridge Abutments**

All backfill material placed adjacent to bridge abutments is subject to the quality controls for upper zone material.

**B.7.5.6 Embankments of the project 20 feet or higher regardless of zone to be known as special compaction area**

All embankment material placed where embankments are 20 feet or higher regardless of zone is subject to the quality controls for upper zone material. Exclude MSE wall backfill.

For this contract, the station ranges where embankments are 20 feet or higher and require higher levels of compaction (special compaction) are as follows:

-Sunset Drive Station 53+00 to Station 57+50

**B.7.6 Control Limits**

**B.7.6.1 Field Density**

**B.7.6.1.1 General Conditions**

The lower control limit for field density measurements in the upper zone is a minimum of 95.0 percent of the maximum dry density as determined by AASHTO T 99 or T 272 for the 4‑point running average and a minimum of 92.0 percent of the maximum dry density for any individual test.

The lower control limit for field density measurements in the lower zone is a minimum of 93.0 percent of the maximum dry density as determined by AASHTO T 99 or T 272 for the 4‑point running average and a minimum of 90.0 percent of the maximum dry density for any individual test.

**B.7.6.1.2 Embankments of the project 20 feet or higher regardless of zone to be known as special compaction area excluding MSE wall backfill**

The lower control limit for field density measurements in the special compaction area is a minimum of 98.0 percent of the maximum dry density as determined by AASHTO T 99 or T 272 for the 4-point running average and a minimum of 95.0 percent of the maximum dry density for any individual test.

**B.7.6.2 Field Moisture Content**

**B.7.6.2.1 General Conditions**

The upper control limit for the field moisture content in the upper and lower zones is 105.0 percent of the optimum moisture as determined by AASHTO T 99 or T 272 for the 4-point running average.

The lower control limit for the field moisture content in the upper and lower zones is 65.0 percent of the determined optimum moisture for the 4-point running average. There is no lower control limit for the field moisture of material having less than 5 percent passing the No. 200 sieve.

**B.7.6.2.2 Embankments of the project 20 feet or higher regardless of zone to be known as special compaction area excluding MSE wall backfill**

The upper control limit for the field moisture content in the special compaction area is 105.0 percent of the optimum moisture as determined by AASHTO T 99 or T 272 for the 4-point running average. The lower control limit for the field moisture content in the special compaction area is 90 percent of the determined optimum moisture for the 4-point running average.

**B.7.7 Corrective Action**

Notify the engineer if an individual field density test falls below the individual test control limit. Perform corrective actions, acceptable to the engineer to improve the density of the subgrade material. After corrective action, perform a randomly located retest within the represented quantity to ensure that the material is acceptable. The field density tests, soil moisture content tests and soil stability must meet the requirements of this special provision for the fill to be considered acceptable.

Notify the engineer if the field density or field moisture running average point falls below the running average control limit for field density or outside the control limits for field moisture. The subgrade in this area is unacceptable. Perform corrective actions, acceptable to the engineer to improve the quality of the material represented by the running average point. Retest each corrected area at a new random location within its represented quantity and determine a new 4-point running average. If the new running average is not acceptable, perform further corrective actions and retest at new random locations.

If the contractor's control data is proven incorrect resulting in a field density or field moisture point falling below the control limit for field density or outside the control limits for field moisture, the subgrade is unacceptable. Employ the methods described above for unacceptable material.

**B.8 Department Testing**

**B.8.1 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 verification and independent assurance personnel for the project.

The department will provide field density and field moisture test results to the contractor on the day of testing. Test results from Proctor split samples will be provided to the contractor within 7 business days after the sample has been received by the department.

**B.8.2 Verification Testing**

The department will have an HTCP technician, or ACT under the direction of a certified technician, perform QV sampling and testing. Department verification testing personnel must meet the same certification level requirements specified for contractor testing personnel for each test being verified. The department will notify the contractor before testing so the contractor can observe QV testing.

The department will test field density and field moisture randomly at locations independent of the contractor’s QC work. The department will use split samples for verification of Proctor testing. In all cases, the department will conduct the verification tests in a separate laboratory and with separate equipment from the contractor's QC tests.

The department will perform verification testing as follows:

1. The department will conduct verification tests on Proctor split samples taken by the contractor. These samples may be from the Soil Source Study or the one‑point Proctor or sample locations chosen by the engineer from anywhere in the process. The minimum verification testing frequency is one per 90,000 cubic yards, with at least one for each soil type identified in the Soil Source Study.

2. The department will test the first split sample obtained by the contractor for the one-point Proctor. The engineer may select any contractor-retained sample for verification testing.

3. The department will conduct at least one verification test for field density and field moisture per 20,000 cubic yards.

Plot verification tests on the contractor’s quality control charts as specified in B.6.1. Do not include verification tests in the 4-point running average.

If verification tests are within specified control limits, no further action is required. If verification tests are not within specified control limits, the engineer and contractor will jointly investigate any testing discrepancies. The investigation may include additional testing as well as review and observation of both the department's and contractor's sampling and testing procedures and equipment. Both parties will document all investigative work.

Correct all deficiencies. If the contractor does not respond to an engineer request to correct a deficiency or resolve a testing discrepancy, the engineer may suspend grading work until action is taken. Resolve disputes as specified in B.9.

**B.8.3 Independent Assurance Testing**

Independent assurance is unbiased testing the department performs to evaluate the department's verification and the contractor's QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform the independent assurance review according to the department’s independent assurance program, which 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.

Plot the independent assurance tests on the contractor’s quality control charts as specified in B.6.1. Do not include independent assurance tests in the 4-point running average.

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 grading work until action is taken. Resolve disputes as specified in B.9.

**B.9 Dispute Resolution**

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 E 178 to evaluate potential statistically outlying data.

If the project personnel cannot resolve a dispute and the dispute affects payment or could result in incorporating nonconforming product, 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 tests 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.

**B.10 Acceptance**

The department will accept the material tested under this provision based on the contractor QC tests unless it is shown through verification testing or the dispute resolution process that the contractor’s test results are in error.

**C (Vacant)**

**D (Vacant)**

**E Payment**

Costs for furnishing all sampling, testing, and documentation required under this special provision are incidental to the work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor’s pay. The department will administer pay reduction under the non‑performance of QMP administrative item.

~~sef-207-005 (20171004)~~

1. Borrow Special.

*Replace standard spec 208.1(1) with the following:*

This section describes constructing embankments and other portions of the work consistent with the earthwork summary and defines the contract requirements for borrow material if required by the plans or if the contractor elects to utilize off-site material to complete the roadway embankments.

*Delete standard spec 208.2.2(2).*

*Add the following to standard spec 208.3:*

The contractor shall be responsible for complying with all permit requirements in obtaining borrow materials.

*Replace standard spec 208.4 with the following:*

The department will not measure borrow.

*Replace standard spec 208.5 with the following:*

The department will not pay directly for work specified under this standard spec. This work is incidental to the Roadway Embankment bid item.

SER-208.1 (20170627)

1. Select Borrow.

**A General**

Conform to the requirements of spec 208 and as hereinafter provided.

**B Material**

Furnish and use material that consists of granular material meeting the following requirements:

Conform to the requirements of standard spec 209.2, except that the material shall contain maximum of 5.0% by weight passing the No. 200 sieve.

1. QMP Base Aggregate.

**A Description**

**A.1 General**

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

(2) Conform to standard spec 301, standard spec 305, and standard spec 310 as modified here in this special provision. Apply this special provision to material placed under all of the Base Aggregate Dense and Base Aggregate Open Graded bid items, except do not apply this special provision to material classified as reclaimed asphaltic pavement placed under the Base Aggregate Dense bid items.

(3) Do not apply this special provision to material placed and paid for under the Aggregate Detours, Breaker Run, Select Crushed, Pit Run, Subbase, or Riprap bid items.

(4) Provide and maintain a quality control program, defined as all activities related to and documentation of the following:

1. Production and placement control and inspection.
2. Material sampling and testing.

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

<http://wisconsindot.gov/rdwy/cmm/cm-08-00toc.pdf>

**A.2 Small Quantities**

(1) The department defines a small quantity, for each individual Base Aggregate bid item, as a contract quantity of 9000 tons or less of material as shown in the schedule of items under that bid item.

(2) The requirements under this special provision apply equally to a small quantity for an individual bid item except as follows:

**A.2.1 Quality Control Plan**

(1) Submit an abbreviated quality control plan consisting of the following:

1. Organizational chart including names, telephone numbers, current certifications with HTCP numbers, and expiration dates, and roles and responsibilities of all persons involved in the quality control program for material under affected bid items.

**A.2.2 Contractor Testing**

1. Testing frequency:

|  |  |
| --- | --- |
| **Contract Quantity** | **Minimum Required Testing per source** |
| ≤ 6000 tons | One stockpile test before placement, and two production or one loadout test. *[1] [2]* |
| > 6000 tons and ≤ 9000 tons | One stockpile and Three placement tests *[3] [4] [5]* |

*[1]* Submit production test results to the engineer for review before incorporating the material into the work. Production test results are valid for a period of 3 years.

*[2]* If the actual quantity overruns 6,000 tons, on the next day of placement perform one randomly selected placement test for each 3000 tons, or fraction of 3000 tons, of overrun.

*[3]* If the actual quantity overruns 9000 tons, on the next day of placement perform one randomly selected placement test for each 3000 tons, or fraction of 3000 tons, of overrun.

*[4]* For 3-inch material or lift thickness of 3 inch or less, obtain samples at load-out.

*[5]* Divide the aggregate into uniformly sized sublots for testing.

1. Stockpile testing for concrete pavement recycled in place will be sampled on the first day of production.
2. Until a four point running average is established, individual placement tests will be used for acceptance. Submit aggregate load-out and placement test results to the engineer within one business day of obtaining the sample. Assure that all properties are within the limits specified for each test.
3. Material represented by a sublot with any property outside the specification limits is nonconforming. The department may reject material or otherwise determine the final disposition of nonconforming material as specified in standard spec 106.5.

**A.2.3 Department Testing**

(1) The department will perform testing as specified in B.8 except as follows:

Department testing may be waived for contract bid item quantities of 500 tons or less.

**B Materials**

**B.1 Quality Control Plan**

(1) Submit a comprehensive written quality control plan to the engineer at or before the pre-construction meeting. Do not place base before the engineer reviews and comments on the plan. Construct the project as that plan provides.

(2) Do not change the quality control plan without the engineer’s review. Update the plan with changes as they become effective. Provide a current copy of the plan to the engineer and post in each of the contractor’s laboratories 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 means that will be used, and action time frames.
3. A list of source and processing locations, section and quarter descriptions, for all aggregate materials requiring QC testing.
4. Test results for wear, sodium sulfate soundness, freeze/thaw soundness, and plasticity index of all aggregates requiring QC testing. Obtain this information from the region materials unit or from the engineer.
5. Descriptions of stockpiling and hauling methods.
6. Locations of the QC laboratory, retained sample storage, and where control charts and other documentation is posted.
7. An outline for resolving a process control problem. Include responsible personnel, required documentation, and appropriate communication steps.

**B.2 Personnel**

(1) Have personnel certified under the department’s highway technician certification program (HTCP) perform sampling, testing, and documentation as follows:

|  |  |  |
| --- | --- | --- |
| SAMPLING AND TESTING ROLES | TEST STANDARD | REQUIRED CERTIFICATION |
| Random Sampling of Materials  Sampling Aggregates | ASTM D3665  AASHTO T2 *[1]* | Transportation Materials Sampling Technician (TMS)  Aggregate Technician I (AGGTEC-I)  AGGTEC-I Assistant Certified Technician (ACT-AGG) |
| Percent passing the 200 Sieve  Gradation  Moisture Content  Fractured Faces | AASHTO T11  AASHTO T27  AASHTO T255  ASTM D5821 | Aggregate Technician I (AGGTEC-I)  AGGTEC-I Assistant Certified Technician (ACT-AGG) |
| Liquid and Plasticity Index | AASHTO T89  AASHTO T90 | Aggregate Testing for Transportation Systems (ATTS)  Grading Technician I (GRADINGTEC-1)  Grading Assistant Certified Technician (ACT-Grading) |
| Plasticity Check | AASHTO T90 | Aggregate Technician I (AGGTEC-I)  AGGTEC-I Assistant Certified Technician (ACT-AGG) Grading Technician I (GRADINGTEC-1)  Grading Assistant Certified Technician (ACT-Grading) |

*[1]* Plant personnel under the direct observation of an aggregate technician certified at level one or higher may operate equipment to obtain samples.

(2) 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.

**B.3 Laboratory**

(1) Perform QC testing at a department-qualified laboratory. Obtain information on the Wisconsin laboratory qualification program from:

Materials Management Section

3502 Kinsman Blvd.

Madison, WI 53704

Telephone: (608) 246-5388

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/appr-prod/qual-labs.aspx>

**B.4 Quality Control Documentation**

**B.4.1 General**

(1) Submit base aggregate placement documentation to the engineer within 10 business days after completing base placement. Ensure that the submittal is complete, neatly organized, and includes applicable project records and control charts.

**B.4.2 Records**

(1) Document all placement observations, inspection records, and control adjustments daily in a permanent field record. Also include all test results in the project records. Provide test results to the engineer within one business day after obtaining a sample. Post or distribute tabulated results using a method mutually agreeable to the engineer and contractor.

**B.4.3 Control Charts**

(1) Plot gradation and fracture on the appropriate control chart as soon as test results are available. Format control charts according to CMM 8.30. Include the project number on base placement control charts. Maintain separate control charts for each base aggregate size, source or classification, and type.

(2) Provide control charts to the engineer within one business day after obtaining a sample. Post or distribute charts using a method mutually agreeable to the engineer and contractor. Update control charts daily to include the following:

1. Contractor individual QC tests.
2. Department QV tests.
3. Department IA tests.
4. Four-point running average of the QC tests.

(3) Except as specified under B.8.2.1 for nonconforming QV placement tests, include only QC placement tests in the running average. The contractor may plot process control or informational tests on control charts, but do not include these tests, conforming QV tests, or IA tests in the running average.

**B.5 Contractor Testing**

(1) Test gradation, fracture, liquid limit and plasticity index during placement for each base aggregate size, source or classification, and type.

(2) Perform one stockpile test from each source before placement. One stockpile test may be used for multiple projects up to 60 calendar days.

(3) Test gradation once per 3000 tons of material placed or fraction thereof. Determine random sample locations and provide those sample locations to the engineer. Obtain samples after the material has been bladed, mixed, and shaped but before watering and compacting; except collect 3-inch samples or lift thickness of 3 inch or less from the stockpile at load-out. Do not sample from material used to maintain local traffic or from areas of temporary base that will not have an overlying pavement. On days when placing only material used to maintain local traffic or only temporary base that will not have an overlying pavement, no placement testing is required.

(4) Split each contractor QC sample and identify it according to CMM 8.30. Retain the split for seven calendar days in a dry, protected location. If requested for department comparison testing, deliver the split to the engineer within one business day.

(5) The engineer may require additional sampling and testing to evaluate suspect material or the technician’s sampling and testing procedures.

(6) Test fracture for each gradation test until the fracture running average is above the lower warning limit. Subsequently, the contractor may reduce the frequency to one test per 10 gradation tests if the fracture running average remains above the warning limit.

(7) Test the liquid limit and plasticity index for the first gradation test. Subsequently, test the liquid limit and plasticity index a minimum of once per 10 gradation tests.

**B.6 Test Methods**

**B.6.1 Gradation**

(1) Test gradation using a washed analysis conforming to the following as modified in CMM 8.60:

Gradation AASHTO T 27

Material finer than the No. 200 sieve AASHTO T 11

(2) For 3-inch base, if 3 consecutive running average points for the percent passing the No. 200 sieve are 8.5 percent or less, the contractor may use an unwashed analysis. Wash at least one sample out of 10. If a single running average for the percent passing the No. 200 sieve exceeds 8.5 percent, resume washed analyses until 3 consecutive running average points are again 8.5 percent passing or less.

(3) Maintain a separate control chart for each sieve size specified in standard spec 305 or standard spec 310 for each base aggregate size, source or classification, and type. Set control and warning limits based on the standard specification gradation limits as follows:

1. Control limits are at the upper and lower specification limits.
2. There are no upper warning limits for sieves allowing 100 percent passing and no lower control limits for sieves allowing 0 percent passing.
3. Dense graded warning limits, except for the No. 200 sieve, are 2 percent within the upper and lower control limits. Warning limits for the No. 200 sieve are set 0.5 percent within the upper and lower control limits.
4. Open graded warning limits for the 1-inch, 3/8-inch, and No. 4 sieves are 2 percent within the upper and lower control limits. Upper warning limits for the No. 10, No. 40, and No. 200 sieves are 1 percent inside the upper control limit.

**B.6.2 Fracture**

(1) Test fracture conforming to CMM 8.60. The engineer will waive fractured particle testing on quarried stone.

(2) Maintain a separate fracture control chart for each base aggregate size, source or classification, and type. Set the lower control limit at the contract specification limit, either specified in another special provision or in table 301-2 of standard spec 301.2.4.5. Set the lower warning limit 2 percent above the lower control limit. There are no upper limits.

**B.6.3 Liquid Limit and Plasticity**

(1) Test the liquid limit and plasticity according to AASHTO T 89 and T 90.

(2) Ensure the material conforms to the limits specified in standard spec table 301-2.

**B.7 Corrective Action**

**B.7.1 General**

(1) Consider corrective action when the running average trends toward a warning limit. Take corrective action if an individual test exceeds the contract specification limit. Document all corrective actions both in the project records and on the appropriate control chart.

**B.7.2 Placement Corrective Action**

(1) Do not blend additional material on the roadbed to correct gradation problems.

(2) Notify the engineer whenever the running average exceeds a warning limit. When two consecutive running averages exceed a warning limit, the engineer and contractor will discuss appropriate corrective action. Perform the engineer’s recommended corrective action and increase the testing frequency as follows:

1. For gradation, increase the QC testing frequency to at least one randomly sampled test per 1000 tons placed.
2. For fracture, increase the QC testing frequency to at least one test per gradation test.

(3) If corrective action improves the property in question such that the running average after four additional tests is within the warning limits, the contractor may return to the testing frequency specified in B.5.3. If corrective action does not improve the property in question such that the running average after four additional individual tests is still in the warning band, repeat the steps outlined above starting with engineer notification.

(4) If the running average exceeds a control limit, material starting from the first running average exceeding the control limit and ending at the first subsequent running average inside the control limit is nonconforming and subject to pay reduction.

(5) For individual test results significantly outside the control limits, notify the engineer, stop placing base, and suspend other activities that may affect the area in question. The engineer and contractor will jointly review data, data reduction, and data analysis; evaluate sampling and testing procedures; and perform additional testing as required to determine the extent of potentially unacceptable material. The engineer may direct the contractor to remove and replace that material. Individual test results are significantly outside the control limits if meeting one or more of the following criteria:

1. A gradation control limit for the No. 200 sieve is exceeded by more than 3.0 percent.
2. A gradation control limit for any sieve, except the No. 200, is exceeded by more than 5.0 percent.
3. The fracture control limit is exceeded by more than 10.0 percent.

**B.8 Department Testing**

**B.8.1 General**

(1) 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 two business days after the department obtains the sample.

**B.8.2 Verification Testing**

**B.8.2.1 General**

(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 B.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 of each base aggregate size, source or classification, and type during placement conforming to the following:

1. Perform one stockpile test from each source before placement.
2. At least one random test per 30,000 tons, or fraction of 30,000 tons, placed.

(3) The department will sample randomly, at locations independent of the contractor’s QC work, collecting one sample at each QV location. The department will collect QV samples after the material has been bladed, mixed, and shaped but before watering and compacting; except, for 3-inch aggregates or for a lift thickness of 3 inch or less, the department will collect samples at load-out. The department will split each sample, test half for QV, and retain half.

(4) The department will conduct QV 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 the specification, the department will take no further action. If QV test results are nonconforming, add the QV to the QC test results as if it were an additional QC test.

**B.8.3 Independent Assurance**

(1) Independence 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 B.9.

**B.9 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 E 178 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, 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 (Vacant)**

**D (Vacant)**

**E Payment**

(1) Costs for all sampling, testing, and documentation required under this special provision are incidental to this work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor’s pay. The department will administer pay reduction under the non-performance of QMP administrative item.

(2) For material represented by a running average exceeding a control limit, the department will reduce pay according to CMM 8-10.5.2 for the affected Base Aggregate bid items listed in subsection A. The department will administer pay reduction under the Nonconforming QMP Base Aggregate Gradation or Nonconforming QMP Base Aggregate Fracture Administrative items. The department will determine the quantity of nonconforming material as specified in B.7.2.

stp-301-010 (20171130)

1. Shaping Roadway, Item 305.0502.S.

**A Description**

This special provision describes blading the existing shoulder aggregates on the prepared foundation across the pavement removal area, and shaping and compacting the aggregate according to the pertinent provisions of standard spec 305, as shown on the plan, and as hereinafter provided.

**B (Vacant)**

**C (Vacant)**

**D Measurement**

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

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 305.0502.S | Shaping Roadway | STA |

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

stp-305-005 (20080902)

1. Breaker Run.

*Add the following to standard spec 311.2:*

Conform to the following gradation:

SEIVE PERCENTAGE PASSING (by weight)

6-Inch 90 – 100

1 1/2-Inch 20 – 50

No. 10 0 - 10

*Delete standard spec 311.2(4)*

1. Select Crushed Material.

*Replace standard spec 312.2(6) with the following:*

The department will assess Select Crushed Material acceptability based primarily on the engineer’s visual inspection. The department may require the contractor to sample, test, and report gradation or the fracture results to show conformance of the material. One test per source, production process, or change of production process may be required.

*Replace standard spec 312.5(2) with the following:*

Payment for Select Crushed Material is full compensation for providing and compacting Select Crushed Material and all work necessary to provide gradation or fracture test results.

SER-312.1 (20160831)

1. 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 all 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 all 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)

1. QMP HMA Pavement Nuclear Density.

**A Description**

Replace standard spec 460.3.3.2 (1) and standard spec 460.3.3.2 (4) with the following:

(1) This special provision describes density testing of in-place HMA pavement with the use of nuclear density gauges. Conform to standard spec 460 as modified in this special provision.

(2) Provide and maintain a quality control program defined as all activities and documentation of the following:

1. Selection of test sites.

2. Testing.

3. Necessary adjustments in the process.

4. Process control inspection.

(3) Chapter 8 of the department’s construction and materials manual (CMM) provides additional detailed guidance for QMP work and describes required procedures. Obtain the CMM from the department’s web site at:

<http://roadwaystandards.dot.wi.gov/standards/cmm/index.htm>

(4) The department’s Materials Reporting System (MRS) software allows contractors to submit data to the department electronically, estimate pay adjustments, and print selected reports. Qualified personnel may obtain MRS software from the department’s web site at:

<http://www.atwoodsystems.com/mrs>

**B Materials**

**B.1 Personnel**

(1) Perform HMA pavement density (QC, QV) testing using a HTCP certified nuclear technician I, or a nuclear assistant certified technician (ACT-NUC) working under a certified technician.

(2) If an 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.

**B.2 Testing**

(1) Conform to ASTM D2950 and CMM 8.15 for density testing and gauge monitoring methods. Perform nuclear gauge measurements using gamma radiation in the backscatter position. Perform each test for 4 minutes of nuclear gauge count time.

**B.3 Equipment**

**B.3.1 General**

(1) Furnish nuclear gauges from the department’s approved product list at

<http://www.dot.wisconsin.gov/business/engrserv/approvedprod.htm>.

(2) Have the gauge calibrated by the manufacturer or an approved calibration service within 12 months of its use on the project. Retain a copy of the manufacturer’s calibration certificate with the gauge.

(3) Prior to each construction season, and following any calibration of the gauge, the contractor must perform calibration verification for each gauge using the reference blocks located in the department’s central office materials laboratory. To obtain information or schedule a time to perform calibration verification, contact the department’s Radiation Safety Officer at:

Materials Management Standard spec

3502 Kinsman Blvd.

Madison, Wisconsin 53704

Telephone: (608) 243-5998

**B.3.2 Comparison of Nuclear Gauges**

**B.3.2.1 Comparison of QC and QV Nuclear Gauges**

(1) Select a representative standard spec of the compacted pavement prior to or on the first day of paving for the correlation process. The standard spec does not have to be the same mix design.

(2) Compare the 2 or more gauges used for density measurement (QC, QV). The QC and QV gauge operators will perform the correlation on 5 test sites jointly located. Record each density measurement of each test site for the QC, QV and back up gauges.

(3) Calculate the average of the difference in density of the 5 test sites between the QC and QV gauges. Locate an additional 5 test sites if the average difference exceeds 1.0 lb/ft3. Measure and record the density on the 5 additional test sites for each gauge.

(4) Calculate the average of the difference in density of the 10 test sites between the QC and QV gauges. Replace one or both gauges if the average difference of the 10 tests exceeds 1.0 lb/ft3 and repeat correlation process from B.3.2.1 (2).

(5) Furnish one of the QC gauges passing the allowable correlation tolerances to perform density testing on the project.

**B.3.2.2 Comparison Monitoring**

(1) After performing the gauge correlation specified in B.3.2.1, establish a project reference site approved by the department. Clearly mark a flat surface of concrete or asphalt or other material that will not be disturbed during the duration of the project. Perform correlation monitoring of the QC, QV, and all back-up gauges at the project reference site.

(2) Conduct an initial 10 density tests with each gauge on the project reference site and calculate the average value for each gauge to establish the gauge’s reference value. Use the gauge’s reference value as a control to monitor the calibration of the gauge for the duration of the project.

(3) Check each gauge on the project reference site a minimum of one test per day if paving on the project. Calculate the difference between the gauge’s daily test result and its reference value. Investigate if a daily test result is not within 1.5 lb/ft3 of its reference value. Conduct 5 additional tests at the reference site once the cause of deviation is corrected. Calculate and record the average of the 5 additional tests. Remove the gauge from the project if the 5-test average is not within 1.5 lb/ft3 of its reference value established in B.3.2.2(2).

(4) Maintain the reference site test data for each gauge at an agreed location.

**B.4 Quality Control Testing and Documentation**

**B.4.1 Lot and Sublot Requirements**

**B.4.1.1 Mainline Traffic Lanes, Shoulders, and Appurtenances**

(1) A lot consists of the tonnage placed each day for each layer and target density specified in standard spec 460.3.3.1. A lot may include partial sublots.

(2) Divide the roadway into sublots. A sublot is 1500 lane feet for each layer and target density.

(3) A sublot may include HMA placed on more than one day of paving. Test sublots at the pre-determined random locations regardless of when the HMA is placed. No additional testing is required for partial sublots at the beginning or end of a day’s paving.

(4) If a resulting partial quantity at the end of the project is less than 750 lane feet, include that partial quantity with the last full sublot of the lane. If a resulting partial quantity at the end of the project is 750 lane feet or more, create a separate sublot for that partial quantity.

(5) Randomly select test locations for each sublot as specified in CMM 8.15 prior to paving and provide a copy to the engineer. Locate and mark QC density test sites when performing the tests. Perform density tests prior to opening the roadway to traffic.

(6) Use Table 1 to determine the number of tests required at each station, depending on the width of the lane being tested. When more than one test is required at a station, offset the tests 10 feet longitudinally from one another to form a diagonal testing row across the lane.

|  |  |  |
| --- | --- | --- |
| **Lane Width** | **No. of Tests** | **Transverse Location** |
| 5 ft or less | 1 | Random |
| Greater than 5 ft to 9 ft | 2 | Random within 2 equal widths |
| Greater than 9 ft | 3 | Random within 3 equal widths |

**Table 1**

**B.4.1.2 Side Roads, Crossovers, Turn Lanes, Ramps, and Roundabouts**

(1) A lot represents a combination of the total daily tonnage for each layer and target density.

(2) Each side road, crossover, turn lane, ramp, and roundabout must contain at least one sublot for each layer.

(3) If a side road, crossover, turn lane, or ramp is 1500 feet or longer, determine sublots and random test locations as specified in B.4.1.1.

(4) If a side road, crossover, turn lane, or ramp is less than 1500 feet long, determine sublots using a maximum of 750 tons per sublot and perform the number of random tests as specified in Table 2.

|  |  |
| --- | --- |
| **Side Roads, Turn Lanes, Crossovers, Ramps, Roundabouts: Sublot/Layer tonnage** | **Minimum Number of Tests Required** |
| 25 to 100 tons | 1 |
| 101 to 250 tons | 3 |
| 251 to 500 tons | 5 |
| 501 to 750 tons | 7 |

**Table 2**

**B.4.2 Pavement Density Determination**

**B.4.2.1 Mainline Traffic Lanes and Appurtenances**

(1) Calculate the average sublot densities using the individual test results in each sublot.

(2) If all sublot averages are no more than one percent below the target density, calculate the daily lot density by averaging the results of each random QC test taken on that day’s material.

(3) If any sublot average is more than one percent below the target density, do not include the individual test results from that sublot when computing the lot average density and remove that sublot’s tonnage from the daily quantity for incentive. The tonnage from any such sublot is subject to disincentive pay according to standard spec 460.5.2.2.

**B.4.2.2 Mainline Shoulders**

**B.4.2.2.1 Width Greater Than 5 Feet**

(1) Determine the pavement density as specified in B.4.2.1.

**B.4.2.2.2 Width of 5 Feet or Less**

(1) If all sublot test results are no more than 3.0 percent below the minimum target density, calculate the daily lot density by averaging all individual test results for the day.

(2) If a sublot test result is more than 3.0 percent below the target density, the engineer may require the unacceptable material to be removed and replaced with acceptable material or allow the nonconforming material to remain in place with a 50 percent pay reduction. Determine the limits of the unacceptable material according to B.4.3.

**B.4.2.3 Side Roads, Crossovers, Turn Lanes, Ramps, and Roundabouts**

(1) Determine the pavement density as specified in B.4.2.1.

**B.4.2.4 Documentation**

(1) Document QC density test data as specified in CMM 8.15. Provide the engineer with the data for each lot within 24 hours of completing the QC testing for the lot.

**B.4.3 Corrective Action**

(1) Notify the engineer immediately when an individual test is more than 3.0 percent below the specified minimum in standard spec 460.3.3.1. Investigate and determine the cause of the unacceptable test result.

(2) The engineer may require unacceptable material specified in B.4.3(1) to be removed and replaced with acceptable material or allow the nonconforming material to remain in place with a 50 percent pay reduction. Determine limits of the unacceptable area by measuring density of the layer at 50-foot increments both ahead and behind the point of unacceptable density and at the same offset as the original test site. Continue testing at 50-foot increments until a point of acceptable density is found as specified in standard spec 460.5.2.2(1). Removal and replacement of material may be required if extended testing is in a previously accepted sublot. Testing in a previously accepted sublot will not be used to recalculate a new lot density.

(3) Compute unacceptable pavement area using the product of the longitudinal limits of the unacceptable density and the full sublot width within the traffic lanes or shoulders.

(4) Retesting and acceptance of replaced pavement will be according to standard spec 105.3.

(5) Tests indicating density more than 3.0 percent below the specified minimum, and further tests taken to determine the limits of unacceptable area, are excluded from the computations of the sublot and lot densities.

(6) If 2 consecutive sublot averages within the same paving pass and same target density are more than one percent below the specified target density, notify the engineer and take necessary corrective action. Document the locations of such sublots and the corrective action that was taken.

**B.5 Department Testing**

**B.5.1 Verification Testing**

(1) The department will have a HTCP certified technician, or ACT working under a certified technician, perform verification testing. The department will test randomly at locations independent of the contractor’s QC work. The department will perform verification testing at a minimum frequency of 10 percent of the sublots and a minimum of one sublot per mix design. The sublots selected will be within the active work zone. The contractor will supply the necessary traffic control for the department’s testing activities.

(2) The QV tester will test each selected sublot using the same testing requirements and frequencies as the QC tester.

(3) If the verification sublot average is not more than one percent below the specified minimum target density, use the QC tests for acceptance.

(4) If the verification sublot average is more than one percent below the specified target density, compare the QC and QV sublot averages. If the QV sublot average is within 1.0 lb/ft3 of the QC sublot average, use the QC tests for acceptance.

(5) If the first QV/QC sublot average comparison shows a difference of more than 1.0 lb/ft3 each tester will perform an additional set of tests within that sublot. Combine the additional tests with the original set of tests to compute a new sublot average for each tester. If the new QV and QC sublot averages compare to within 1.0 lb/ft3, use the original QC tests for acceptance.

(6) If the QV and QC sublot averages differ by more than 1.0 lb/ft3 after a second set of tests, resolve the difference with dispute resolution specified in B.6. The engineer will notify the contractor immediately when density deficiencies or testing precision exceeding the allowable differences are observed.

**B.5.2 Independent Assurance Testing**

(1) Independent assurance is unbiased testing the department performs to evaluate the department’s verification and the contractor’s QC sampling and testing including personnel qualifications, procedures, and equipment. The department will perform the independent assurance review according to the department’s independent assurance program.

**B.6 Dispute Resolution**

(1) The testers may perform investigation in the work zone by analyzing the testing, calculation, and documentation procedures. The testers may perform gauge correlation according to B.3.2.1.

(2) The testers may use correlation monitoring according to B.3.2.2 to determine if one of the gauges is out of tolerance. If a gauge is found to be out of tolerance with its reference value, remove the gauge from the project and use the other gauge’s test results for acceptance.

(3) If the testing discrepancy cannot be identified, the contractor may elect to accept the QV sublot density test results or retesting of the sublot in dispute within 48 hours of paving. Traffic control costs will be split between the department and the contractor.

(4) If investigation finds that both gauges are in error, the contractor and engineer will reach a decision on resolution through mutual agreement.

**B.7 Acceptance**

(1) The department will not accept QMP HMA Pavement Nuclear Density if a non‑correlated gauge is used for contractor QC tests.

**C (Vacant)**

**D (Vacant)**

**E Payment**

**E.1 QMP Testing**

(1) Costs for all sampling, testing, and documentation required under this special provision are incidental to the work. If the contractor fails to perform the work required under this special provision, the department may reduce the contractor’s pay. The department will administer pay reduction under the Non-performance of QMP administrative item.

**E.2 Disincentive for HMA Pavement Density**

(1) The department will administer density disincentives according to standard spec 460.5.2.2.

**E.3 Incentive for HMA Pavement Density**

(1) The department will administer density incentives according to standard spec 460.5.2.3.

stp-460-020 (20161130)

1. Cold Patch, Item 495.1000.S.

**A Description**

This special provision describes furnishing cold patch and filling potholes and other voids in existing pavement surfaces as the engineer directs.

**B Materials**

Furnish a mixture of course aggregate, natural sand, and MC-250 bituminous material designed to have a workability range of 15-100º F without heating. Ensure that the mixture:

* Adheres to wet surfaces.
* Resists damage from water, salt, and deicing products.
* Requires no mixing or special handling before use.
* Supports traffic immediately after placement and compaction.

Conform to the following gradation:

SIEVE SIZE PERCENT PASSING (by weight)

1/2-inch (12.5 mm) 100

3/8-inch (9.5 mm) 90 - 100

No. 4 (4.75 mm) –90 max

No. 8 (2.38 mm) 20 - 65

No. 200 (0.074 mm) 2 - 10

Bitumen 4.8 - 5.4

The department will accept cold patch based primarily on the engineer's visual inspection. The department may also test for gradation.

**C Construction**

Stockpile cold patch on site on a smooth, firm, well-drained area cleared of vegetation and foreign material. Cover the stockpile and ensure that it is easily accessible. Replenish the stockpile throughout the project duration, but limit the size at any given time to 10 tons on site unless the engineer approves otherwise. Dispose of unused material at project completion unless the engineer directs otherwise.

Place cold patch by hand. Remove ponded water and loose debris before placement. Compact flush with a tamper, roller, or vehicle tire after placement.

Refill patched areas as necessary to maintain a flush pavement surface until project completion.

**D Measurement**

The department will measure Cold Patch by the ton, acceptably stockpiled on site.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 495.1000.S | Cold Patch | TON |

Payment for Cold Patch is full compensation for providing and maintaining patches; for furnishing and replenishing stockpiled material on-site; and for disposing of excess material at project completion.

stp-495-010 (20160607)

1. Ice Hot Weather Concreting, Item 501.1000.S.

Conform to standard spec 501.3.8.2 except the department will pay for ice at the contract unit price under the Ice Hot Weather Concreting bid item. This special provision only applies to work done under the following contract bid items:

Concrete Masonry Bridges Concrete Masonry Retaining Walls

Concrete Masonry Bridges HES Concrete Masonry Retaining Walls HES

Concrete Masonry Culverts Concrete Masonry Endwalls

Concrete Masonry Culverts HES Concrete Masonry Overlay Decks

High Performance Concrete (HPC) Masonry Structures

*Replace standard spec 501.4 and 501.5 with the following:*

**501.4 Measurement**

(1) The department will measure Ice Hot Weather Concreting by the pound, acceptably completed, measured only if the conditions prescribed in standard spec 501.3.8.2 are met.

**501.5 Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 501.1000.S | Ice Hot Weather Concreting | LB |

(2) Payment for Ice Hot Weather Concreting is full compensation for ice used to cool concrete placed in hot weather as specified in standard spec 501.3.8.2.

(3) The department will not pay directly for the concrete specified under this standard spec. Concrete is incidental to the various bid items using it. Payment under those bid items includes providing all materials, including aggregates and associated aggregate source testing, cement, fly ash, slag, and admixtures; for preparing, transporting, storing, protecting and curing concrete; and for contractor requirements related to testing specified in standard spec 501.3.10.

(4) If required to remove and replace any concrete damaged by lack of proper protection. Perform this work at no expense to the department.

501-010 (20151210)

1. Bar Steel Reinforcement HS Stainless Structures, Item 505.0800.S.

**A Description**

This special provision describes furnishing and placing stainless steel reinforcing bars.

Conform to standard spec 505 as modified in this special provision.

**B Materials**

**B.1 General**

Furnish stainless steel reinforcing bars conforming to ASTM A955 and to one of the following Unified Numbering System (UNS) designations: S31653, S31803, S32205, or S32304. Supply grade 60 bars, all of the same UNS designation. Conform to the chemical composition specified for the given UNS designation in ASTM A276 table 1.

Supply bars that are free of dirt, mill scale, oil, and debris by pickling to a bright or uniform light finish. The department may reject bars displaying rust/oxidation, questionable blemishes, or lack of a bright or uniform pickled surface.

Furnish chairs or continuous supports made of stainless steel or recycled plastic to support high-strength stainless bar steel reinforcement subject to the plastic chair restriction stated in standard spec 505.3.4(1).

Furnish tie wire made from one of the UNS alloys allowed for bar steel or from an engineer-approved plastic or nonmetallic material. Ensure that stainless steel tie wire is dead soft annealed.

**B.2 Fabrication**

Before fabrication, supply test results from an independent testing agency certifying that the reinforcement meets the requirements of Annex A1 of ASTM A955.

Bend bars conforming to standard spec 505.3.2 and according to ASTM A955. Bend and cut bars using equipment thoroughly cleaned or otherwise modified to prevent contamination from carbon steel or other contaminants. Use tools dedicated solely to working with stainless steel.

**B.3 Control of Material**

Identify reinforcement bars delivered to the project site with tags bearing the identification symbols used in the plans. Include the UNS designation, heat treat condition, heat number, grade corresponding to minimum yield strength level, and sufficient documentation to track each bar bundle to a mill test report.

Provide samples for department testing and acceptance according to CMM 8-50 Exhibit 1 requirements for concrete masonry reinforcement for uncoated bar steel.

Provide mill test reports for the project that do the following:

1. Verify that sampling and testing procedures and test results conform to ASTM A955, ASTM A276 table 1, and these contract requirements.

2. Include a chemical analysis with the UNS designation, heat lot identification, and the source of the metal.

3. Include tensile strength, yield strength, and elongation tests results conforming to ASTM A955 for each size furnished.

4. Certify that the bars have been pickled to a bright or uniform light finish.

**C Construction**

**C.1 General**

Ship, handle, store, and place the stainless steel reinforcing as follows:

1. Separate from regular reinforcement during shipping. Pad points of contact with steel chains or banding, or secure with non-metallic straps.

2. Store on wooden cribbing separated from regular reinforcement. Cover with tarpaulins if stored outside.

3. Handle with non-metallic slings.

4. Do not flame cut or weld. Protect from contamination when cutting, grinding, or welding other steel products above or near the stainless steel during construction.

5. Place on plastic or stainless steel bar chairs. If placing stainless steel chairs on steel beams, use chairs with plastic-coated feet.

6. Tie with stainless steel wire or an engineer-approved plastic or nonmetallic material.

Do not tie stainless steel reinforcing bars to, or allow contact with, uncoated reinforcing bars or galvanized steel. Maintain at least 1-inch clearance between stainless steel bars or dowels and uncoated or galvanized steel. Where 1-inch clearance is not possible, sleeve bars with a continuous polyethylene or nylon tube at least 1/8-inch thick extending at least 1 inch in each direction and bind with nylon or polypropylene cable ties. Sleeves are not required between stainless steel bars and shear studs. Stainless steel bars can be in direct contact with undamaged epoxy-coated bars.

Cut flush with the top flange or remove uncoated fasteners, anchors, lifting loops, or other protrusions into a bridge deck before casting the deck on prestressed concrete beams.

**C.2 Splices**

Splice as the plans show.

If increasing or altering the number or type of bar splices the plans show, provide revised plan sheets to the engineer showing the reinforcement layout, type, length, and location of revised bar splices and revised bar lengths. Obtain engineer approval for the location of new lap splices. Ensure that new lap splices are at least as long as those the plans show.

**D Measurement**

The department will measure Bar Steel Reinforcement HS Stainless Structures by the pound, acceptably completed, computed from the nominal weights of corresponding sizes for carbon steel deformed bars in AASHTO M31 regardless of stainless steel alloy provided. The department will not measure extra material used if the contractor alters the reinforcement layout as allowed under C.2, extra material for splices or couplers the plans do not show, or the weight of devices used to support or fasten the steel in position.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 505.0800.S | Bar Steel Reinforcement HS Stainless Structures | LB |

Payment for Bar Steel Reinforcement HS Stainless Structures is full compensation for furnishing and placing stainless steel reinforcing bars, including supports.

1. Sheet Membrane Waterproofing for Top Slab C-67-88, Item 516.0610.S.01.

**A Description**

Furnish and install a primer, waterproofing membrane, hot rubberized sealer or mastic, or both, on the concrete top slab as shown on the plans and as hereinafter provided.

**B Materials**

**B.1 Waterproofing System**

Provide a material in the waterproofing system that is specifically designed for use with an asphaltic concrete overlay. The membrane shall consist of a cold-applied, self-adhering membrane incorporating a heat resistant woven or non-woven fabric or fiberglass reinforcing laminated in between layers of polymer modified bitumen or SBS modified rubberized asphalt. The membrane shall have a release film, polyester or polyethylene on the down side and may have a thin spun bonded open weave polyester fabric on the up side that will bond with the asphaltic concrete overlay; yet will permit driving rubber-tired trucks, pavers and other construction vehicles on the membrane covered deck slab.

Provide a composite sheet membrane with the following properties:

|  |  |  |
| --- | --- | --- |
| **Property** | **Test Method** | **Specific Value** |
| Width |  | 36 inch min. |
| Tensile Strength | ASTM D412 | 50 lb/inch or 700 psi min. |
| Thickness |  | 60 mils to 80 mils |
| Puncture Resistance | ASTM E154 | 40 lb min. |
| Permeance | ASTM E96, Method B | 0.05 US Perms max. |
| Low Temperature Pliability | ASTM D146, 1-inch Mandrel @ -25º F | No cracks or splits at 180º bend |
| Water Absorption | ASTM D570, 72 hours | 0.25% max. |
| Peel Adhesion | ASTM D903 | 5 lb/in width min. |
| Crack Cycling @ -15º F, 10 cycles | ASTM C836 | No cracks or splits |
| Compound Softening Point | ASTM D36 | 210º F ±20º F |
| Viscosity of Membrane | ASTM D4402 | 3500 centipoise |
| Rubberized Asphalt, @329º F |  |  |

Provide rubberized asphalt compound containing not more than 15% inorganic residue or filler material.

Provide primer, mastic and/or hot rubberized asphalt sealer conforming to the specified properties required by the manufacturer of the waterproofing membrane.

**B.2 Materials Certification**

Prior to membrane approval for initial submittals and/or upon reformulation of membrane material compounds, submit to the engineer a notarized certification by an independent test laboratory stating that the materials conform to the requirements of these specifications.

The certification shall include or have attached specific results of tests performed on the material supplied. The engineer may at his option require samples of any material for testing. Previously approved membranes will be provisionally accepted by manufacturer’s certification on their company letterhead, but may be subject to control or approval, or both by subsequent testing.

**C Construction**

**C.1 Application Methods**

Apply materials in strict accordance to the manufacturer’s instructions. In order to install the waterproofing membrane, the slab temperature shall be a minimum of 45º F and rising. Before applying the system, become acquainted with the materials specified and their handling characteristics and become thoroughly familiar with the construction procedures recommended by the manufacturer. Furnish a copy of the recommended procedures to the engineer. To establish procedures for maintaining optimum working conditions and to coordinate work related to adjacent construction, hold a pre-installation conference with a manufacturer’s representative, the engineer, and other affected contractors prior to starting construction. To provide quality assurance that the membrane has been properly installed, a manufacturer’s representative familiar with membrane installation procedures shall be present during placement of the membrane.

Finish all concrete surfaces that will be in contact with the membrane with a magnesium float finish. Provide a minimum concrete cure time of seven days before placing the primer.

The slab shall be clean, dry, and free from mud, dirt, sand, oil, or grease, and any other contaminants prior to application of the primer. No vehicles or equipment will be permitted on the concrete slab after surface preparation except those necessary for the installation of the waterproofing membrane. The engineer will inspect the concrete slab prior to the application of the primer. Do not begin application of either the primer or membrane until after the engineer grants approval.

To coat all surfaces that will be covered with the membrane, apply primer uniformly as recommended by the manufacturer. Use roller, brush, or spray to apply primer to the surfaces. If spraying is used, an approved method of protecting the environment is required.

Allow the primer to dry until tack free, approximately 45 minutes, before applying the membrane. Apply primer only to an area that will be covered with the membrane within the same calendar day. If the surface of the concrete slab becomes contaminated, clean and re-prime the area.

Apply primer to the inside face of any header to the top of the header. Take care to ensure that all inside corners are coated with primer.

After the primer has dried to a tack free condition, apply one layer of membrane to the slab starting on the low side edge.

To form a bond with the primed slab, remove the release film from the membrane on the tacky side while the membrane is rolled face down. Apply the membrane using hand methods or by using mechanical applicators. Overlap a minimum of 2.5 inches at the edges of each strip and overlap the membrane in such a manner to provide a shingling effect toward the low side of the slab cross section. Overlap a minimum of 5 inches at the ends of each strip of membrane and overlap the membrane in such a manner to provide a shingling effect toward the lower side of the slab profile. Roll the entire membrane surface with a rubber tire roller to ensure firm and uniform contact with the primed surface. Use special care to ensure that the membrane is uniformly adhered to the concrete and that the entire membrane is free of wrinkles, air bubbles, and other placement defects. In the event bubbles or blisters do form under the membrane, puncture the bubbles or blisters with a sharp pointed instrument such as an awl and press the membrane firmly into contact with the deck. Repair any membrane punctures, tears, holes, and misaligned or inadequate seams with a patch of waterproofing membrane sized as required to ensure that the membrane is watertight.

Cover the inside corners of any concrete header and all other perimeter edges with narrow strips (flashing strips of approximately 12 inches), hot rubberized sealer, or mastic according to the manufacturer’s guidelines. As an additional method of ensuring a watertight bond, all terminating edges, transverse overlaps and longitudinal overlaps may be heated with a propane torch to soften the top mat and fuse the surfaces together.

The applicator foreman or leadworker shall be certified by the manufacturer of the waterproofing membrane as approved applicators, and shall be present during all applications.

**C.2 Where Overlaying the Membrane Directly with Asphaltic Concrete**

Construct the asphaltic concrete overlay according to scheduling requirements elsewhere in the contract. Cover all of the exposed membrane with the specified asphaltic concrete mix within five days after installation. Only rubber-tired construction vehicles shall be permitted on the membrane. Use caution not to turn the tires when a vehicle is stationary. To prevent tearing the membrane, avoid sudden starts, stops, accelerations, or decelerations. Chemical solvents, gasoline, diesel fuel, mineral spirits, etc. or other deleterious substances shall not be spilled or leaked onto the membrane. Prior to covering the membrane with asphaltic concrete overlay, clean the membrane of mud, dirt, sand, oil, grease, or any other contaminants, and dry the membrane. Patch contaminated areas as required by the engineer. When required to accommodate traffic control staging, the construction of the asphalt concrete overlay shall stay at least 6 inches away from the terminating edge of the membrane to provide for overlap.

The placement temperature of the asphaltic concrete shall be between 300º F and 350º F. Do not place asphaltic concrete on the membrane outside of this temperature range. The temperature of the uncompacted mat of asphaltic concrete shall not fall below 280º F prior to rolling. The thickness of the asphaltic concrete layers shall be as shown on the plans; the initial layer shall have a minimum compacted thickness of 1½-inches. The membrane applicator contractor shall have a minimum of one employee present during all asphaltic concrete paving operations to ensure that all necessary membrane repairs are accomplished.

**C.3 Where Not Overlaying the Membrane Directly with Asphaltic Concrete**

Place a 6-inch thick layer of clean granular fill material (sand), free of any aggregate, stones or other angular materials that may puncture the membrane, over the membrane covered slab. Cover all exposed membrane with the clean granular fill within five days after installation. Only rubber-tired construction vehicles shall be permitted on the membrane. Use caution not to turn the tires when a vehicle is stationary. To prevent tearing the membrane, avoid sudden starts, stops, accelerations, or decelerations. Chemical solvents, gasoline, diesel fuel, mineral spirits, or other deleterious substances shall not be spilled or leaked onto the membrane. When required to accommodate traffic control staging, the placement of fill material shall stay at least 12 inches away from the terminating edge of the membrane to provide for overlap. The membrane applicator contractor shall have a minimum of one employee present during the placement of the clean granular fill material to ensure that all necessary membrane repairs are accomplished.

**D Measurement**

The department will measure Sheet Membrane Waterproofing for Top Slab (Structure), installed according to the contract and accepted, in area by the square yard. Measurement shall be based on the horizontal distance between the faces of any concrete headers and the horizontal length of membrane installed. Any material specified to be applied up vertical faces of any header or vertically down at the ends of the slab shall be included in the measured quantity.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 516.0610.S.01 | Sheet Membrane Waterproofing for Top Slab C-67-88 | SY |

Payment is full compensation for furnishing and placing the primer, membrane, mastic, and hot rubberized asphalt sealer; and preparing the surface. Clean granular fill material (sand), where required, will be paid for using the bid item Backfill Structure.

stp-516-061 (20110930)

1. General Storm Sewer and Pipe Culvert Construction.

Project 2788-00-71 includes staged construction including the staged construction of proposed drainage conduits.

The contractor is responsible for maintaining the integrity of work completed in previous stages and any portion of existing roadway carrying staged traffic during the project.

All connections to previously installed storm sewer or pipe culverts are considered incidental to the associated bid item work being performed.

Any temporary shoring methods and/or materials, as determined by the contractor, deemed necessary to complete all stages and connections of storm sewer or pipe culverts is considered incidental to the associated bid item work being performed.

1. Cover Plates Temporary, Item 611.8120.S.

**A Description**

This special provision describes furnishing, installing and removing a steel plate to cover and support asphaltic pavement and traffic loading at manholes, inlets and similar structures during milling and paving operations.

**B Materials**

Provide a 0.25-inch minimum thickness steel plate that extends to the outside edge of the existing masonry.

**C (Vacant)**

**D Measurement**

The department will measure Cover Plates Temporary as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 611.8120.S | Cover Plates Temporary | EACH |

Payment is full compensation for furnishing, installing, and removing the cover plates.

The steel plates shall become the property of the contractor when no longer needed in the contract work.

611-006 (20151210)

1. Pipe Grates, Item 611.9800.S.

**A Description**

This special provision describes furnishing and installing pipe grates on the ends of pipes as shown in the plans, and as hereinafter provided.

**B Materials**

Furnish steel conforming to the requirements of standard spec 506.2.2.1. Furnish steel pipe conforming to the requirements of standard spec 506.2.3.6.

Furnish pipe grates galvanized according to ASTM A123.

Furnish angles and brackets galvanized according to ASTM A123.

Furnish required hardware galvanized according to ASTM A153.

**C Construction**

Repair pipes, rods, angles and brackets on which the galvanized coating has been damaged according to the requirements of AASHTO M36M.

**D Measurement**

The department will measure Pipe Grates in units of work where one unit is one grate, completed and accepted.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 611.9800.S | Pipe Grates | EACH |

Payment is full compensation for furnishing and installing all materials; and for drilling and connecting grates to pipes.

611-010 (20030820)

1. Fence Safety, Item 616.0700.S.

**A Description**

This special provision describes furnishing and installing a plastic fence at locations shown on the plans and as hereinafter provided.

**B Materials**

Furnish notched conventional metal “T” or “U” shaped fence posts.

Furnish fence fabric meeting the following requirements.

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

**C Construction**

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

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

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

**D Measurement**

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

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 616.0700.S | Fence Safety | LF |

Payment is full compensation for furnishing and installing fence and posts; maintaining the fence and posts in satisfactory condition; and for removing and disposing of fence and posts at project completion, and for furnishing all labor, tools, equipment, and incidentals necessary to complete the contract work.

616-030 (20160607)

1. Silt Fence Maintenance.

*Add the following to standard spec 628.3.4.2, 628.4.8 and 628.5.8:*

Silt fence maintenance shall include inspection and maintenance of Heavy Duty Silt Fence.

1. Temporary Ditch Checks.

Complete work according to standard spec 628 and as herein provided. Erosion bales will not be allowed for construction of temporary ditch checks.

*Delete standard spec 628.3.14(2) and replace it with the following:*

(2) Construct temporary ditch checks using a manufactured alternative from the PAL. Place temporary ditch checks across ditches at locations the plans show or as the engineer directs immediately after shaping the ditches or slopes. Excavate upstream sumps as the engineer directs.

*Delete standard spec 628.4.17 and replace it with the following:*

(1) The department will measure Temporary Ditch Checks by the linear foot, acceptably completed.

1. Mobilizations Erosion Control.

*Replace standard spec 628.5.11(2) with the following:*

Failure to mobilize within 72 hours of the engineer’s written order will result in a $1500 per calendar day deduction from money due under the contract, for each calendar day of delay. The engineer may extend the 72-hour period for delays that are not the contractor’s fault.

1. Mobilizations Emergency Erosion Control.

*Replace standard spec 628.5.12(2) with the following:*

Failure to mobilize within 8 hours of the engineer’s written order will result in a $1500 per calendar day deduction from money due under the contract, for each calendar day of delay. The engineer may extend the 8-hour period for delays that are not the contractor’s fault.

1. Soil Stabilizer Type A, Item 628.6505.

*Replace standard spec 628.2.11(2) with the following:*

(2) Furnish Soil Stabilizer type A from one of the following department approved products. Verify that materials are still on the department’s PAL list prior to use:

|  |  |  |  |
| --- | --- | --- | --- |
| **Manufacturer** | **Product** | **Minimum**  **Application Rate (Pounds/Acre)** | **WDNR Use Restriction**  **Maximum Application. Rate, (Pounds/Acre)** |
| American Excelsior | Bindex | 3200 | 3413 |
| North American Green | Hydra CX‐2 | 3500 | 4000 |
| North American Green | Hydra CM | 3500 | 4000 |
| Profile Products | Flexterra HP | 3500 | 3500 |
| Profile Products | ProMatrix | 3500 | 3500 |
| Terra Novo | Earth Guard Fiber Matrix | 3000 | 3000 |

1. Stone or Rock Ditch Checks, Item 628.7515.S.

**A Description**

This special provision describes furnishing and installing stone or rock ditch checks as shown on the plans or as directed by the engineer, or both, and as hereinafter provided.

**B Materials**

Provide materials conforming to size requirements for size no. 2 coarse aggregate for concrete masonry or riprap according to the standard spec 501.2.5.4.4. Railroad ballast or breaker run stone conforming to the following applicable gradations may also be used:

|  |  |
| --- | --- |
| **Railroad Ballast** | |
| **Sieve Size** | **Percent by**  **Weight Passing** |
| 2 Inch | 100 |
| 1 Inch | 20 – 55 |
| 3/8 Inch | 0 -5 |

|  |  |
| --- | --- |
| **Breaker Run Stone** | |
| **Sieve Size** | **Percent by**  **Weight Passing** |
| 5 Inch | 100 |
| 1½ Inch | 0 – 50 |
| 3/8 Inch | 0 - 5 |

Incorporate stone or rock in the ditch checks that is hard, sound, and durable, and meets the approval of the engineer.

**C Construction**

Place stone or rock ditch checks immediately after shaping of the ditches or slopes is completed. Place stone or rock ditch checks at right angles to the direction of flow and construct to the dimensions and according to the details shown in the plans.

Remove sediment from behind the stone or rock ditch checks when it has accumulated to one half of the original height of the dam.

**D Measurement**

The department will measure Stone or Rock Ditch Checks in volume by the cubic yard of material, incorporated in the work.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 628.7515.S | Stone or Rock Ditch Checks | CY |

Payment is full compensation for furnishing, producing, crushing, loading, hauling, placing, and shaping and maintaining Stone or Rock Ditch Check.

The quantity of sediment removed shall be multiplied by a factor of ten and paid for as Common Excavation.

628-050 (20151210)

1. Furnishing Plant Materials.

*Add the following to standard spec 632.2.2.1:*

All plants shall be grown within the states of Wisconsin, Minnesota, Michigan, or parts of northern Illinois located within Zone 5 of the “Plant Hardiness Zone Map” produced by the United States Department of Agriculture, Miscellaneous Publication No. 1475, issued January 2012

1. Landscape Planting Surveillance and Care Cycles.

*Replace standard spec 632.3.18.1.1 with the following:*

A plant establishment period of one year shall follow the completion of planting.

*Delete standard spec 632.3.18.1.2.*

If the care specialist fails to perform any of the required care cycles as specified in standard spec 632.3.19.1, the department will assess daily damages in the amount of $200.00 to cover the cost of performing the work with other forces. The department will assess these damages for each day the requirements of the care cycle remain incomplete, except when the engineer extends the required time period.

632-005 (20070510)

1. Foundation Drilling 36-Inch Diameter, Item 636.0050.S.01.

**A Description**

This special provision describes drilling holes for the H pile posts for retaining walls.

**B (Vacant)**

**C Construction**

Submit the proposed method for foundation drilling before beginning construction.

Drill holes to the diameter and depth the plans show. If necessary, use casing or alternative engineer-approved methods to maintain an open hole. If bentonite or other slurry is used to maintain an open hole, prevent spillage of the slurry into adjacent waterways. Locate the holes within the following tolerances:

Horizontal Location 3 inches

Vertical Location 1 inch

Vertical Alignment 1/8 inch per foot

**D Measurement**

The department will measure the Foundation Drilling bid items by the linear foot, acceptably completed, measured from the bottom of the hole to the top of the foundation footing.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 636.0050.S.01 | Foundation Drilling 36-Inch | LF |

Payment is full compensation for drilling holes; for furnishing casing or alternative drilling methods; and, if rock is encountered, for coring rock.

stp-636-010 (20140630)

1. Signs Type I and II.

Furnish and install new mounting brackets per approved product list for type II signs on overhead sign supports incidental to sign. For type II signs on sign bridges use aluminum vertical support beams noted above incidental to sign.

*Add the following to standard spec 637.2.4:*

Use stainless steel bolts, washers and nuts for type I and type II signs mounted on sign bridges or type I signs mounted on overhead sign supports. Use clips on every joint for Sign Plate A 4-6 when mounted on a sign bridge or overhead sign support. Inspect installation of clips and assure bolts and nuts are tightened to manufacturers recommended torque values.

Use aluminum vertical sign support beams that have a 5-inch wide flange and weigh 3.7 pounds per foot, if the L-brackets are 4 inches wide then use 4 inch wide flange beams weighing 3.06 pounds per foot. Contractor shall measure the width of the L-brackets on existing structures of determine the width needed for sign support beams

Use beams a minimum of 6 feet in length or equal to the height of the sign to be supported, whichever is greater. Use U-bolts that are made of stainless steel, 1/2 inch diameter and of the proper size to fit the truss cords of each sign bridge. Install vertical sign support beams on each sign and use new U-bolts to attach each beam to the top and bottom cord of the sign bridge truss.

For type II signs on overhead sign supports follow the approved product list for mounting brackets.

*Add the following to standard spec 637.3.3.2(2):*

Install Type I Signs at the offset stated in the plan, which shall be the clear distance between the edge of mainline pavement right edgeline and the near edge of the sign.

*Add the following to standard spec 637.3.3.3(3):*

Furnish and install new aluminum vertical sign support beams on each sign and new U‑bolts to attach each beam to the top and bottom cord of the sign bridge truss for Type I or Type II Signs and Type I signs on overhead sign supports incidental to sign.

*Add the following to standard spec 641.2.9(3):*

Submit shop drawings for sign bridges and overhead sign supports to SE Region, Traffic Operations Engineer, Tom Heydel and Bureau of Structures Design.

SER-637.1 (20170621)

1. Pond Liner Clay, Item 640.1303.S.

**A Description**

This special provision describes furnishing and installing low permeable clay in the areas shown on the plans.

**B Materials**

For each source, prior to 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 prior to 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 shown on the plans perpendicular to the surface.

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Table 1 | | | | | |
| Reference | Number | Test Title | Requirements | Testing Frequency | |
| Screening | QA/QC12 |
| AASHTO1 | T99-01 | Moisture –Density Relationships of Soils Using a 2.5-kg (5.5 lb) Rammer a 305 mm (12-in.) Drop (Standard Proctor) | NA11 | 1/source | NA |
| AASHTO | T-88-00 | Particle Size Analysis of Soils | P2003 > 50% | 2/source | 1/lift |
| AASHTO | T-89-02 | Determining the Liquid Limit of Soils | LL4 > 22% | 2/source | 1/lift |
| AASHTO | T-90-00 | Determining the Plastic Limit and Plasticity Index of Soils | PI5 > 12% | 2/source | 1/lift |
| AASHTO | T310-03 | In-Place Density and Moisture Content of Soils and Soil-Aggregates by nuclear Methods (Shallow Depth) | DD6 > 95% of the MDD7 | NA | 100’x100’  Grid/lift |
| ASTM2 | D5084-03 | Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter | K8 < 1 x 10-7 cm/sec | 1/source9 | 1/site10 |
| 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 prior to 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.

640-016 (20130615)

1. Sign Bridge Identification Plaques.

*Add the following to standard spec 641.5:*

Payment for Sign Bridge and Overhead Sign Support includes furnishing and installing sign bridge identification plaques and mounting hardware as shown on the standard detail drawing in the plans for each existing and new sign bridge or overhead sign support.

SER-641.1 (20160902)

1. Traffic Control.

The work under this item shall be according to the pertinent requirements of standard spec 643, as shown on the plans, or as approved by the engineer, except as hereinafter set forth.

*Add the following to standard spec 643.3.1:*

Have available at all times sufficient experienced personnel to promptly install, remove and reinstall the required traffic control devices to route traffic in order to perform the operations.

Place traffic control devices for work in the proper location before operations proceed. Traffic Control is subject to change at the direction of the engineer in the event of an emergency.

Provide the Waukesha County Sheriff’s Department, City of Waukesha Police Department, City of Waukesha Fire Department, Wisconsin State Patrol, the Statewide Traffic Operations Center and the engineer a current telephone number with which the contractor or his representative can be contacted during non-working hours in the event a traffic control safety hazard develops.

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

Do not store materials, equipment, or park vehicles within 4 feet of the row of barrels that separates traffic from the work zone.

Yield to all through traffic at all locations. Equip the top of all contractor and personal vehicles and equipment operating in 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.

Obtain approval from the engineer to use a flag person to direct, control, or stop traffic.

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, shoulder delineators or beam guard in place along the traveled roadways without the approval of the engineer.

The traffic requirements are subject to change at the direction of the engineer in the event of an emergency.

1. Nighttime Work Lighting Stationary.

**A Description**

Provide portable lighting as necessary to complete nighttime work. Nighttime operations consist of work specifically scheduled to occur after sunset and before sunrise.

**B (Vacant)**

**C Construction**

**C.1 General**

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

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

1. Layout, including location of portable lighting – lateral placement, height, and spacing. Clearly show on the layout the location of all lights necessary for every aspect of work to be done at night.

2. Specifications, brochures, and technical data of all lighting equipment to be used.

3. The details on how the luminaires will be attached.

4. Electrical power source information.

5. Details on the louvers, shields, or methods to be employed to reduce glare.

6. Lighting calculations. Provide illumination with average to minimum uniformity ratio of 5:1 or less throughout the work area.

7. Detail information on any other auxiliary equipment.

**C.2 Portable Lighting**

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

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

**C.3 Light Level and Uniformity**

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

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

**C.4 Glare Control**

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

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

1. Aim tower-mounted luminaires, either parallel or perpendicular to the roadway, so as to minimize light aimed toward approaching traffic.

2. Aim all luminaires such that the center of beam axis is no greater than 60 degrees above vertical (straight down).

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

**C.5 Continuous Operation**

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

**D (Vacant)**

**E Payment**

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

643-010 (20100709)

1. Locating No-Passing Zones, Item 648.0100.

For this project, the spotting sight distance in areas with a 55 mph posted speed limit is 0.21 miles (1108 feet).

stp-648-005 (20060512)

1. General Requirements For Electrical Work.

*Replace standard spec 651.3.3 (3) with the following:*

Request a signal inspection of the signal installation to the engineer after completing the Prerequisites for Underground Inspection or Prerequisites for Above Ground Inspection at least five working days prior to the time of the requested inspection. Notify the department's Electrical Field Unit at (414) 266-1170 to coordinate the inspection. The department's Region Electrical personnel will perform the inspection. In the event of deficiencies, request a re-inspection when the work is corrected. The engineer will not authorize continuation to above ground work or turn-on until the contractor corrects all deficiencies.

1. Electrical Conduit.

*Replace standard spec 652.5 (2) with the following:*

Payment for Conduit Rigid Metallic, Conduit Rigid Nonmetallic, Conduit Reinforced Thermosetting Resin, and Conduit Special bid items is full compensation for providing the conduit, conduit bodies, and fittings; for providing all conduit hangers, clips, attachments, and fittings used to support conduit on structures; for pull wires or ropes; for expansion fittings and caps; for making necessary connections into existing pull box, manhole, junction box or communication vault; for excavating, bedding, and backfilling, including any sand, concrete, or other required materials; for disposing of surplus materials; and for making inspections.

*Replace standard spec 652.5 (5) with the following:*

Payment for Conduit Loop Detector is full compensation for providing all materials, including conduit, compacted backfill, surface sealer if required, pull wire if required, condulets, conduit fittings, and for making necessary connections into existing pull box, manhole, junction box or communication vault.

1. Electrical Wiring.

*Replace standard spec 655.5 (11) with the following:*

Payment for Loop Detector Wire is full compensation for furnishing and installing loop detector wire; for making necessary connections to the lead in cable; and for measuring the loop inductance and ground resistance.

*Replace standard spec 655.3.10 with the following:*

Under the Traffic Signal EVP Detector Cable bid item, provide the EVP cable and mount department furnished brackets. The department will determine the exact location to ensure that the installation does not create a sight obstruction.

Ensure that the cable runs continuously without splicing from the pull box closest to the cabinet including the specified extra cable. Do not splice EVP cable from the detector assembly to the controller terminations. Provide 10 feet of extra cable at the mounting bracket and 2.5 feet extending out of the mounting bracket. Provide 10 feet of extra cable in each pull box plus an additional 20 feet at the nearest pull box to signal base where the EVP detector head is mounted.

Mark each end of the lead as noted on the plan sheet. For a cabinet that is not operating the signal, the contractor will terminate the ends and install the discriminators and card rack in the cabinet. If the cabinet is operating the signal, the cabinet wiring will be done by the department.

Notify the engineer upon completion of the installation at each intersection.

*Replace standard spec 655.5 (12) with the following:*

Payment for Traffic Signal EVP Detector Cable is full compensation for providing emergency vehicle preemption detector cable and mounting the department furnished brackets; and for making all necessary connections.

1. Electrical Service Meter Breaker Pedestal STH 59 and CTH X/ Saylesville Road, Item 656.0200.01; USH 18 and STH 59, Item 656.0200.02; USH 18 and CTH D, Item 656.0200.03; USH 18 and Madison Street, Item 656.0200.04.

*Add the following to standard spec 656.2.3:*

The department will be responsible for the electrical service installation request for any department maintained facility. Notify the maintaining authority if the signal is not state maintained that it is their responsibility to arrange for the electrical service installation.

Electrical utility company service installation and energy cost will be billed to and paid for by the maintaining authority.

Install the cabinet base and meter breaker pedestal first, so the electrical utility company can install the service lateral. Install a 3 inch conduit from the point of service from the utility to the meter breaker pedestal. Finish grade the service trench, replace topsoil that is lost or contaminated with other materials, fertilize, seed, and mulch all areas that are disturbed by the electrical utility company.

*Add the following to standard spec 656.5(3):*

Payment is full compensation for grading the service trench; replacing topsoil; and for fertilizing, seeding, and mulching to restore the disturbed area of the service trench.

1. Signalized Intersection Lighting Systems – WisDOT Owned General.

**A General**

*Add the following to standard spec 651, 652, 653, 654, 655, 656, 657 and 659:*

All the work necessary to comply with revisions to standards specifications mentioned herewith 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 spec 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 three days in advance and during regular business hours (Monday – Thursday 7:00 AM to 3:45 PM).

*Add the following to standard spec 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 build these costs into 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 spec 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 conductors or conduits that have been abandoned in place or removed for scrap 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 spec 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 spec 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 spec 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 spec 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 spec 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 spec 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 spec 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 nutted and contractor shall install galvanized rat screen enclosing the bottom of pole area; extra nuts and screen incidental.

*Add the following to standard spec 657.3.1and 657.3.5:*

Corrosion protection measures described in standard spec 657.3.1 and 657.3.5 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 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 will provide the manufacturer with a written notice of any defect within thirty 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](mailto:eric.perea@dot.wi.gov) or at (262) 574-5422 prior to ordering 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 spec 659.3:*

Provide and install or 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.

*Add the following to standard spec 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.

SER-659.1 (20170407)

1. Traffic Signal Faces, Item 658.0173 and Item 658.0174.

*Add the following to standard spec 658.3.2:*

(3) Connect all ungrounded conductors with wire nuts in the appropriate sections of the signal heads. Connect the neutral conductors to the terminal strip. Be certain to twist wires prior to installing the wire nuts. All wire nuts must be installed facing up to prevent the entrance of water.

1. Pedestrian Signal Face 16-Inch, Item 658.0416.

*Add the following to standard spec 658.3.4:*

(3) Connect all ungrounded conductors with wire nuts in the appropriate sections of the signal heads. Connect the neutral conductors to the terminal strip. Be certain to twist wires prior to installing the wire nuts. All wire nuts must be installed facing up to prevent the entrance of water.

1. Pedestrian Push Buttons, Item 658.0500.

*Replace standard spec 658.2.5 with the following:*

Furnish freeze-proof ADA compliant pedestrian push buttons manufactured by a department approved manufacturer.

The contractor shall place a Size 1, Type H reflective (R10-3EL, R, D) sign sticker (per state sign plate), message series – B, directly above each push button. Include a directional arrow or arrows on the sign as the plans show.

1. Luminaires Underdeck LED B, Item 659.1210.

*Add the following to standard spec 659.2:*

The Luminaire shall be UL listed, IP 68 rated. The luminaire shall be Model IWL-3, 55 Watt as manufactured by North Star, Model L1A/L1B, 64 Watt as manufactured by Paramount Industries, or approved equal.

Furnish shop drawings as specified in standard spec 506.3.2, except submit five copies with the materials list. Ensure the drawings contain sufficient detail to allow satisfactory review and show the dimensions of all equipment shown in the plans.

1. Temporary Traffic Signals for Intersections STH 59 and CTH X, Item 661.0200.01; Waukesha Bypass and STH 59/Genesee Road, Item 661.0200.02.

*Replace standard spec 661.2.1 (3) with the following:*

Contractor shall use existing underground electric service and meter breaker pedestal for the operation of the Temporary Traffic Signals. The department will pay for all Energy Costs for the operation of the Temporary Traffic Signal at the existing intersection of STH 59 and CTH X and at the proposed intersection of STH 59 and CTH X/Genesee Road.

Furnish and install a generator to operate the Temporary Traffic Signals for the time required to switch the existing Permanent Traffic Signal over to the Temporary Traffic Signal as well as the time required to switch the Temporary Traffic Signal over to the new Permanent Traffic Signal.

Contractor shall contact the local electrical utility at least four days prior to making the switch from the existing Permanent Traffic Signal to the Temporary Traffic Signal. The contractor shall contact the local electrical utility at least four days prior to making the switch from the Temporary Traffic Signals to the relocated Temporary Traffic Signals and from Temporary Traffic Signals to the new Permanent Traffic Signals.

1. Optimized Aggregate Gradation Incentive.

**Description**

This special provision describes optional contractor optimized aggregate gradation, optional optimized mixture designs, and associated additional requirements for class 1 concrete used in concrete pavements. Conform to standard specification part 7 and as follows:

**Optimized Aggregate Gradation**

A Job Mix Formula (JMF) contains all of the following:

Proportions for each aggregate fraction conforming to table 1.

Individual gradations for each aggregate fraction.

Composite gradation of the combined aggregates including working ranges on each sieve in accordance with table 2.

Submit the target JMF and aggregate production gradation test results to the engineer for review 10 business days before initial concrete placement.

**TABLE 1 TARANTULA CURVE GRADATION BAND**

|  |  |
| --- | --- |
| SIEVE SIZES | PERCENT RETAINED |
| 2 in. | 0 |
| 1 1/2 in. | ≤5 |
| 1 in. | <16 |
| 3/4 in. | <20 |
| 1/2 in. | 4-20 |
| 3/8 in. | 4-20 |
| No. 4 | 4-20 |
| No. 8*[1]* | <12 |
| No. 16*[1]* | <12 |
| No. 30*[1] [2]* | 4-20 |
| No. 50 *[2]* | 4-20 |
| No. 100 *[2]* | ≤10 |
| No. 200 *[2]* | ≤2.3 |

*[1]* Minimum of 15% retained on the sum of the #8, #16, and #30 sieves.

*[2]* Conform to 24-34% retained of fine sand on the #30-200 sieves.

**TABLE 2 JMF WORKING RANGE**

|  |  |
| --- | --- |
| SIEVE SIZES | WORKING RANGE*[1]*  (PERCENT) |
| 2 in. | ±5 |
| 1 1/2 in. | ±5 |
| 1 in. | ±5 |
| 3/4 in. | ±5 |
| 1/2 in. | ±5 |
| 3/8 in. | ±5 |
| No. 4 | ±5 |
| No. 8 | ±4 |
| No. 16 | ±4 |
| No. 30 | ±4 |
| No. 50 | ±3 |
| No. 100 | ±2 |
| No. 200 | ≤ 1.6 |

*[1]* Working range limits of composite gradation based on moving average of 4 tests.

Test each component aggregate once per 1,500 cubic yards during concrete production. Take samples by one of the following sampling methods:

1. At the belt leading to the weigh hopper.

2. Working face of the stock piles at the concrete plant if approved by the engineer.

The department will take independent QV samples using the same sampling method the contractor uses for QC sampling. QV samples may be taken by the contractor's QC personnel if witnessed by the department's QV personnel. The department will split each QV sample and retain half for all dispute resolutions. If QV test results conform to the specification, the department will take no further action. If QV test results are nonconforming, add the QV to the QC test results as if it were an additional QC test.

If, during concrete production, the moving average of four for any sieve fall outside the allowable JMF working range do the following:

1. Notify the engineer of the test results within 1 business day from the time of sampling.

2. Make immediate adjustments to the JMF, within the limits specified in Table 3;

3. Review JMF adjustments with the engineer. Both the contractor and engineer will sign the adjusted JMF if the adjustments comply with Table 3.

4. If the moving average of four falls outside the adjusted allowable working range, stop production and provide a new mix design including JMF to the engineer.

**TABLE 3 ALLOWABLE JMF ADJUSTMENTS**

|  |  |
| --- | --- |
| SIEVE SIZES | ALLOWABLE ADJUSTMENT  (PERCENT) |
| ≥ No. 4 | ±5 |
| No. 8 – No. 30 | ±4 |
| No. 50 | ±3 |
| No. 100 | ±2 |

**Dispute Resolution**

The department will resolve disputes as specified in standard spec 106.3.4.3.5 using QV split samples.

**Sublot and Lot Size**

A sublot consists of up to 1,500 cubic yards. A lot consists of two sublots.

**Optimized Concrete Mixtures**

The contractor may use a reduced cementitious content for concrete pavement placed if the contractor does the following:

1. Use an optimized aggregate gradation as defined in this special provision.

2. Conform to the additional testing requirements for flexural strength as specified in the contract special provisions.

3. Submit aggregate gradation result records no more than 2 years old when developing the mix design.

4. Determine the volume of voids in the optimized aggregates using ASTM C29.

5. Download and follow the instructions tab of the Optimized Gradation and Mix Design Spreadsheet located at:

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/qmp/default.aspx>

6. Design an appropriate paste content based upon the Performance-based PCC Mix Design Guide located at:

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/qmp/default.aspx>

7. Provide a minimum Vpaste/Vvoids of 1.25. (Paste/Void ratio equals the volume of paste divided by the volume of voids.).

8. Evaluate workability of trial batches by following section 6.8 of AASHTO Draft Performance Engineered Concrete Pavement Mixtures Specifications located at:

<http://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/qmp/default.aspx>

9. Submit trial batch workability results when submitting the mix design.

10. Submit the CP Tech center computer spreadsheet concrete mix design to the engineer for review at least 3 business days before producing concrete.

11. Provide a minimum cement content of 520 pounds per cubic yard, except if using type I, IL, or III cement in a mix where the geologic composition of the coarse aggregate is primarily igneous or metamorphic materials, provide a minimum cement content of 660 pounds per cubic yard.

12. The contractor may use class C fly ash or grade 100 or 120 slag as a partial replacement for cement. For binary mixes use up to 30% fly ash or slag. For ternary mixes use up to 30% fly ash plus slag in combination. Replacement values are in percent by weight of the total cementitious material in the mix.

13. See CMM 8-70.2.2.3 for additional guidance.

**Measurement**

The department will measure Optimized Aggregate Gradation Incentive by the dollar, for each combined averaged lot of QC test results meeting Table 1.

**Payment**

The department will pay incentive of 3 percent of the contract unit price for concrete pavement under the following bid item:

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| 715.0710 | Optimized Aggregate Gradation Incentive | DOL |

stp-715-005 (20170615)

1. Flexural Strength for Concrete Mix Design.

This special provision describes optional testing requirements for flexural strength during the mix design process. Conform to standard spec part 7 as modified in this special provision.

*Add the following to standard spec table 701-2:*

|  |  |
| --- | --- |
| TEST | TEST STANDARD |
| Flexural Strength of Concrete | AASHTO T97 |

*Replace standard spec 715.2.3.1(1) with the following:*

(1) Provide both compressive and flexural strength information to demonstrate the strength of the proposed mix design. Use either laboratory strength data for new mixes or field strength data for established mixes as follows:

1. Use at least 5 pairs of cylinders for compressive strength. Demonstrate that the 28‑day compressive strength will equal or exceed the 85 percent within limits criterion specified in 715.5.2.

2. Use at least 5 pairs of beams for flexural strength. Demonstrate that the 28-day flexural strength will equal or exceed 650 psi.

stp-715-010 (20170615)

1. Invasive Species Management – Uplands, Item SPV.0005.01.

**A Description**

This special provision describes furnishing herbicides, cutting buckthorn, treating stumps and foliage, in accordance the specifications as shown on the plans and as hereinafter provided.

**B Materials**

Depending on the vegetation to be treated, apply herbicides in the following concentrations:

**Basal Bark Treatment**

Use a 15% to 20% solution of Garlon 4 herbicide (or an equivalent generic) mixed with Bark Oil Blue.

**Cut Stump Treatment**

Use a 50% solution of Garlon 3 herbicide (or an equivalent generic) mixed with water.

**Foliage Treatment**

Use Garlon 3 or Garlon 4 herbicide mixed with water in a 5% solution.

**C Construction**

A commercial pesticide applicator license application, certification is required for any person who does any of the following:

1) Personally uses or directs the use of ANY pesticide as a commercial applicator for-hire.

2) Personally uses a restricted-use pesticide as a commercial applicator.

3) Directs the use of pesticide by a person specified under 1) or 2).

The following criteria must be followed:

* **Invasive Species Management** shall be completed in the spring of 2019 prior to May 31, 2019. Follow up foliage treatment shall be performed in the fall of 2019 or as directed by the engineer.
* **Upland areas with no buckthorn:** Hand or machine cut all woody vegetation less than 6-inch caliper. Treat stumps with herbicide as described under Materials. Upland areas with buckthorn: Hand or machine cut all woody vegetation less than 6-inch caliper in areas as shown in the plans Treat stumps with herbicide as described under Materials. For buckthorn larger than 6-inch caliper, hand or machine cut and treat buckthorn stumps with herbicide the same day as cutting or basil bark treat the buckthorn.

**C.1 Basil Bark Treatment**

Using a tank or backpack sprayer. Spray the bottom 18 inches of stems all the around the ground line with the herbicide mixture. Applications can occur all year round, except for in the spring. Spring treatment March 1 to May 31 cannot occur without department and DNR approval.

**C.2 Cut Stump Treatment**

Cut unwanted brush and trees with a brush saw, chainsaw or forestry mower, and spray the stump with herbicide the same day. Spray the top and sides of the stump to kill the roots and prevent re-sprouting.

**C.3 Foliage Treatment**

In the late fall while there is still active green leaf growth which has re-sprouted from the buckthorn stumps, apply herbicide to this vegetation. Apply the herbicide if the re-growth is no taller than waist high. If the re-growth is taller than waist high re-cut the growth and then apply herbicide to the stumps. When applying foliar herbicides, a surfactant must be included in the tank mix.

**D Measurement**

The department will measure Invasive Species Management - Uplands by the acre, 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.0005.01 | Invasive Species Management - Uplands | ACRE |

Payment is full compensation for furnishing herbicides, for cutting trees, treating stumps, and for providing follow up treatment.

1. Invasive Species Management – Wetlands, Item SPV.0005.02.

**A Description**

This special provision describes furnishing herbicides, cutting buckthorn, treating stumps and foliage, in accordance the specifications, as shown on the plans and as hereinafter provided.

**B Materials**

Depending on the vegetation to be treated, apply herbicides in the following concentrations:

**Basal Bark Treatment**

Use a 15% to 20% solution of Garlon 4 herbicide (or an equivalent generic) mixed with Bark Oil Blue.

**Cut Stump Treatment**

Use a 50% solution of Garlon 3 herbicide (or an equivalent generic) mixed with water.

**Foliage Treatment**

Use Garlon 3 or Garlon 4 herbicide mixed with water in a 5% solution.

**C Construction**

A commercial pesticide applicator license application, certification is required for any person who does any of the following:

1) Personally uses or directs the use of ANY pesticide as a commercial applicator for-hire.

2) Personally uses a restricted-use pesticide as a commercial applicator.

3) Directs the use of pesticide by a person specified under 1) or 2).

The following criteria must be followed:

* **Invasive Species Management** shall be completed in the spring of 2019 prior to May 31, 2019. Follow up foliage treatment shall be performed in the fall of 2019 or as directed by the engineer.
* **Wetland areas:** Hand cut all buckthorn in areas as shown in the plans. Treat buckthorn stumps with herbicide the same day as cutting or basil bark treat the buckthorn. All other plants to remain in place within the wetland treatment areas.

**C.1 Basil Bark Treatment**

Using a tank or backpack sprayer. Spray the bottom 18 inches of stems all the around the ground line with the herbicide mixture. Applications can occur all year round, except for in the spring. Spring treatment March 1 to May 31 cannot occur without department and DNR approval.

**C.2 Cut Stump Treatment**

Cut unwanted brush and trees with a brush saw, chainsaw or forestry mower, and spray the stump with herbicide the same day. Spray the top and sides of the stump to kill the roots and prevent re-sprouting.

**C.3 Foliage Treatment**

In the late fall while there is still active green leaf growth which has re-sprouted from the buckthorn stumps, apply herbicide to this vegetation. Apply the herbicide if the re-growth is no taller than waist high. If the re-growth is taller than waist high re-cut the growth and then apply herbicide to the stumps. When applying foliar herbicides, a surfactant must be included in the tank mix.

**D Measurement**

The department will measure Invasive Species Management - Wetlands by the acre, 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.0005.02 | Invasive Species Management - Wetlands | ACRE |

Payment is full compensation for furnishing herbicides, for cutting buckthorn trees, treating buckthorn stumps, and for providing follow up buckthorn treatment.

1. Roadway Embankment, Item SPV.0035.01.

**A Description**

Conform to standard spec 207 and amended below:

*Replace standard spec 207.1(1) with the following:*

This special provision describes placing in embankments and in miscellaneous backfills, material obtained under the bid items in the roadway and drainage excavation or excavation for structure sections as shown on the plans, according to standard spec 207 and as hereinafter provided.

*Replace standard spec 207.2(1) with the following:*

The contractor may not place excess topsoil or other unstable soil in embankments when the embankment height exceeds 10 feet. Marsh excavation will not be allowed within embankments. Dispose of excess marsh excavation as described in standard spec 205.3.

**B Materials**

Conform to standard spec 207.2.

**C Construction**

Conform to standard spec 207.3 and as hereinafter provided.

Prior to placing any material for a succeeding layer ensure the previous layer does not have excessive rutting, displacement or distortion under compacting or hauling equipment. If rutting, displacement or distortion is observed the contractor shall inform the engineer how yielding material will be addressed prior to continuing embankment construction.

**D Measurement**

*Replace standard spec 207.4(1) with the following:*

The department will measure roadway embankment with no correction for curvature or settlement by the cubic yard acceptably completed in its final location using the method of average end areas, except as follows:

1. The engineer and contractor mutually agree to an alternative volume calculation method.
2. If it is not possible to compute volumes of the various classes of roadway and drainage embankment by the method of average end areas due to erratic location of isolated deposits, the department may compute the volumes by three-dimensional measurements.

**E Payment**

*Replace standard spec 207.5(1) with the following:*

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0035.01 | Roadway Embankment | CY |

Payment is full compensation for forming, compacting, shaping, sloping, trimming, finishing, maintaining the embankments, all other incidental work required under this section.

SER-207.2 (Revised)

ASP-5 will be applied to this item. The Fuel Usage Factor for this item is 0.23.

1. Pond Outlet Control Manhole, Item SPV.0060.01.

**A Description**

The specification covers all manhole structures with baffle walls for restrictor outlets from stormwater ponds. Furnish and install concrete manhole structure with baffle wall and restrictor holes, according to standard spec 501 and 611, as shown on the plan, and as hereinafter provided.

**B Materials**

Furnish and install reinforced concrete pipe (RCP) and fittings conforming to the requirements for Reinforced Concrete Pipe Storm Sewer and Fittings as set forth in AASHTO M 170 and spec 608.

**C Construction**

The contractor shall be responsible for locating the Pond Outlet Control Manhole and the associated storm sewer connections. The diameter and elevations of existing connections will be field verified by the contractor. Installation shall consist of ensuring the appropriate sump depth is achieved below the lowest pipe invert. No sump will be on the downstream side of the baffle restrictor wall. The sump downstream of the baffle can be filled in with concrete meeting the requirements of standard spec 501 and finished with a broom finish. The baffle restrictor wall shall be constructed out of concrete meeting the requirements of standard spec 501 and as shown on the plans. The inverts of the restrictor openings shall conform to the table in the detail and plans. The opening sizes and elevations do vary for each pond outlet.

Existing stormwater and utility drains that are to enter a structure shall be connected by extending them from the last undisturbed intact pipe to the outside face of the manhole, using RCP pipe of equal size laid on the same grade as the existing drain.

The manhole structure shall be sized as shown on the plans and shall have two Type J-S frame and lid in the flat top cover. Each frame and lid shall be on either side of the baffle wall to allow access to both sides for maintenance.

**D Measurement**

The department will measure Pond Outlet Control Manhole as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.01 | Pond Outlet Control Manhole | EACH |

Payment for Pond Outlet Control Manhole is full compensation according to standard spec 611.5. Payment also includes Manhole Covers Type J-S, baffle wall construction, and pipe connecting and associated fittings.

1. Detention Pond Corrugated Metal Anti-Seep Collar, Item SPV.0060.02.

**A Description**

This item consists of furnishing and installing a corrugated metal aluminum coated collar as shown on the plans and as described herein.

**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. All anti-seep collars and their connections shall be watertight.

**C Construction**

Extend the collar dimensions a minimum of 2.25 feet in all directions around the outside of the conduits, measured perpendicular to the conduit, except the vertical limits of the collar need not exceed 1 foot above the top of pipes. Center the anti-seep collars around the conduits. Install the anti-seep collar at the appropriate locations and inverts, according to the plans.

**D Measurement**

The department will measure Detention Pond Corrugated Metal Anti‑Seep Collar as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.02 | Detention Pond Corrugated Metal Anti-Seep Collar | EACH |

Payment is full compensation for providing the aluminum coated corrugated steel collar.

1. Flared End Section with Trash Rack, Item SPV.0060.03.

**A Description**

The specification covers furnishing, fabricating, and installing reinforced concrete flared end sections and metalwork, including metal parts as necessary, to install flared-end sections with trash racks at the inlet end of culverts as shown on the plans and details.

**B Materials**

Furnish and install smooth steel bars, steel anchor strips, bolts, nuts, miscellaneous hardware and flared-end sections, as necessary to construct the Flared-End Section with Trash Rack, as shown on the plans.

All trash racks shall be constructed with a smooth steel tube as dimensioned on the plans and details. The tube steel and anchor strips shall be A36 and shall meet ASTM A500 Grade B requirements. Anchor strips and connection bolts shall be as shown on the details.

All trash racks components shall have a corrosion protective finish. All welds shall be 1/4‑inch welds.

Flared-end sections shall be furnished according to spec 522.

**C Construction**

Install the reinforced concrete flared-end sections with trash racks at the appropriate locations and inverts, according to the plans and spec 522.

**D Measurement**

The department will measure Flared-End Section with Trash Rack by each unit, installed in place, and the quantity measured for payment shall be the number of units each of the various depths completed and accepted according to the contract and plans.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.03 | Flared End Section with Trash Rack | EACH |

Payment for Flared-end Section with Trash Grate is full compensation according to standard spec 522.

1. Storm Sewer Plug, Item SPV.0060.04.

**A Description**

Install a Storm Sewer Plug at locations specified in the plans.

**B Materials**

Provide a precast reinforced concrete plug or an engineer approved alternative, conforming to the inside diameter of the corresponding pipe as shown on the plan.

Furnish concrete conforming to standard spec 501 and standard spec 611.

**C Construction**

Place a watertight plug in the end of the storm sewer pipe in a manner that seals the pipe, but allows for future removal of plug without damaging the storm sewer pipe.

**D Measurement**

The department will measure Storm Sewer Plug as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.04 | Storm Sewer Plug | EACH |

Payment is full compensation for furnishing and installing all required materials.

(NER11-0217)

1. Rootstock 2 1/ 2-Inch, Item SPV.0060.05.

**A Description**

This special provision describes furnishing and planting perennial plants of the species, varieties and sizes specified, according to standard spec 632, as modified in the article Furnishing and Planting Plant Materials, and as hereinafter provided.

**B Materials**

Provide plants of the specific species, variety, size, color and other characteristics as defined in C Construction. Written approval of the engineer is required for any plant substitution.

Plant material may be vegetative plugs 2 1/2 inches in diameter x 2 1/2 inches deep showing healthy spring plant growth. Plant plugs must be harvested from a known source. Provide engineer with the name, address and phone number of the supplier for approval.

Plant material may also be container grown in plastic “cell packs.” Individual cells shall be a minimum of 2 1/2 x 2 1/2 x 2 ½ inches deep. Container grown seedling height shall be a 3-inch minimum when planted. Provide engineer with the name, address and phone number of the grower for approval.

Use a time release fertilizer conforming to the following minimum requirements:

|  |
| --- |
| Nitrogen……………………….………14% |
| Phosphoric Acid……………….………14% |
| Potash………………………………….14% |

**C Construction**

Upon approval of soil preparation, erosion mat, and nurse crop seeding, by the engineer, install randomly mixed plants 2 feet on center. An approximate 3 inch opening can be created (cut) in the erosion mat in order to plant plugs. Plant species consist of Butterfly Weed 7%, Common Milkweed 9%, New England Aster 6%, Prairie Blazingstar 6%, Showy Goldenrod 9%, Butterfly Weed 6%, Pale Purple Coneflower 9%, Showy Tick Trefoil 6%, Purple Prairie Clover 6%, Wild Lupine 6%, Black-eyed Susan 6%, Leadplant 6%, Whorled milkweed 6%, Common Fox Sedge 6% Bergamont 6%. Excavate holes twice the diameter and 1 inch deeper than depth of the plant plug or container, backfill with Planting Mix.

Perennials shall be planted in the bioretention area at elevation 825, or final surface elevation determined and approved by the engineer.

Thoroughly water-in plants to eliminate all air pockets in backfill.

Plant all perennials between April 15 and June 15 unless directed otherwise by the engineer. Space plants 2 feet on center unless directed by the engineer to modify spacing.

Water plants as in standard spec 632.3.19.1 (2) for plant establishment. After planting, proper care includes watering cutting, weed control. When planted areas reach a height of 9 to 10 inches, mow to a height of 6 inches for weed control during the first year. A last mowing shall occur between the weeks of July to the first week of August.

Plant plugs in prepared planting pockets a minimum of 3 1/2 inches deep and 3 1/2 inches wide and backfilled with Planting Mixture (632.2.3.4). Incorporate timed-release fertilizer thoroughly into the Planting Mixture backfill, at the manufacturers recommended rate.

Contractor shall remove and dispose of all excess material from site.

**D**  **Measurement**

The department will measure Rootstock 2 1/2-Inch as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |  |
| --- | --- | --- | --- |
| ITEM NUMBER | | DESCRIPTION | UNIT |
| SPV.0060.05 | Rootstock 2 1/2-Inch | | EACH |

Payment is full compensation for furnishing all materials, storing plants, excavation, water; mowing; weeding; and for incidentals for the planting of perennial rootstock (container grown).

1. Shallow Marsh Rootstock, Item SPV.0060.06.

**A Description**

This special provision describes furnishing and planting wetland herbaceous plant rootstock of the species specified, complete in the Shallow Marsh as designated on the plans or as directed by the engineer. It also includes furnishing all necessary materials and performing all necessary work such as excavating plant holes, anchoring rootstock, performing necessary care, such as trimming, and required replacements pending acceptance, and doing such work necessary and incidental thereto to complete the item according to the plans, specifications and contract.

**B Materials**

The source of all plant materials shall be nursery-grown stock, not wild-collected, from an area not to exceed 150 linear miles from the project site and within the State of Wisconsin. All plants must be healthy, 1 to 2 years old, and have well-developed root systems. Plants that show evidence of mold, rot, freezing, or frost damage will be rejected. When evidence is submitted that a specified rootstock cannot be obtained, substitutions may be made with the specific approval of the engineer and wetland ecologist.

**Shallow Marsh Planting Zone (0.037 Acres)**

**Scientific Name Common Name Quantity**

*Alisma trivale* water plantain 5

*Scirpus atrovirens* green bulrush 5

*Scirpus fluviatilis* river bulrush 20

*Scirpus validus* soft stem bulrush 10

*Sparganium eurycarpum* giant bur reed 5

*Scirpus cyperinus* wool grass 5

Total 50

**C Construction**

**C.1 General**

Install plants in the shallow marsh prior to any seeding and mulching operations and within the specified planting periods. Care should be taken to minimize disturbance of the Shallow Marsh Planting Zone. Provide the engineer with a 5 working day notice of the intended date of delivery of the shallow marsh rootstock to the project site. Present all shallow marsh rootstock to the engineer for inspection and partial acceptance prior to planting.

**C.2 Care**

All shallow marsh rootstock shall be handled with care and skill to prevent damage and shall be packed in a manner to ensure arrival at the project site in good condition. The shallow marsh rootstock shall be kept moist and cool prior to planting. Do not disturb freshly installed plants with subsequent activities that would cause injury or uprooting.

**C.3 Timing of Planting**

Install wetland rootstock on the day of delivery at the project site. In the event that this is not possible, temporarily store plants by placing them in a well-ventilated, cool, shaded, moist storage space. This storage period shall not exceed 48 hours. Shallow marsh rootstock shall be planted between May 1 and June 15, or after November 1 and prior to November 15.

**C.4 Planting Layout**

Install plants at a density of approximately 1300 plants per acre (spacing approximately one plant per 3 feet) as shown on the plans or as directed by the engineer.

**C.5 Planting Method**

Install plants by hand with the use of a tree spud or other comparable method, or as directed by the engineer.

**D Measurement**

The department will measure Shallow Marsh Rootstock as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.06 | Shallow Marsh Rootstock | EACH |

Payment is full compensation for furnishing, delivering, storing, and planting the plants.

1. Concrete Barrier Transition Type S36A, Item SPV.0060.07.

**A Description**

This special provision describes constructing Concrete Barrier Transition Type 36A according to standard spec 603, details shown in the plans, and as hereinafter provided.

**B Materials**

Conform to standard spec 603.

**C Construction**

Conform to standard spec 603.

**D Measurement**

The department will measure Concrete Barrier Transition Type S36A as each individual unit, acceptably completed.

**E Payment**

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

| ITEM NUMBER | DESCRIPTION | UNIT |
| --- | --- | --- |
| SPV.0060.07 | Concrete Barrier Transition Type S36A | EACH |

Payment is full compensation for furnishing all materials, for excavation, finishing and curing concrete.

1. Utility Line Opening, Item SPV.0060.08.

**A Description**

This special provision describes excavating to uncover utilities for the purpose of determining elevation or location and potential conflicts as shown on the plans or as directed by the engineer.

**B (Vacant)**

**C Construction**

Perform the excavation in such a manner that the utility in question is not damaged and the safety of the workers is not compromised.

Perform the utility line openings as soon as possible and at least 10 days in advance of proposed utility construction to allow any conflicts to be resolved with minimal disruption. Give the engineer a minimum of three working days once utility line opening information is received to review all relevant design information prior to proposed utility construction. Where utilities are within 6 feet of each other at a potential conflict location, only one utility line opening will be called for. In these cases, a single utility line opening will be considered full payment to locate multiple utilities. Utility line openings include a trench up to 10 feet long as measured at the trench bottom, and of any depth required to locate the intended utility.

Approve and coordinate all utility line openings with the engineer. Notify the utility engineers or their agents of this work a minimum of 3 days prior to the work so they may be present when the work is completed.

Replace pavement over utility line opening trenches which are within the staged traffic area as directed by the engineer. Replace pavement and open to traffic within 24 hours of the excavation.

**D Measurement**

The department will measure Utility Line Opening as each individual utility line opening, 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.0060.08 | Utility Line Opening | EACH |

Payment is full compensation for the excavation required to expose the utility line; backfilling with existing material removed from the excavation; compacting the backfill; restoring the site; and for cleanup.

Existing pavement, concrete curb, gutter, and sidewalk removals necessary to facilitate utility line openings are not considered part of or paid for under Utility Line Openings, but are considered separate and measured and paid for separately as removal items. Pavement replacement material, concrete curb, gutter, and sidewalk items will also be considered separate from Utility Line Openings and will be measured and paid for separately.

1. Temporary Sediment Trap, Item SPV.0060.09.

**A Description**

This special provision describes designing constructing and maintaining temporary sediment traps used to intercept sediment-laden runoff and to retain the sediment according to pertinent provisions of standard spec 628, as shown on the plans, and as hereinafter provided.

**B Materials**

Supply materials according to the Wisconsin Department of Natural Resources Technical Standard 1063 (Sediment Trap).

**C Construction**

Design, maintain, and remove Temporary Sediment Traps following the guidance in Wisconsin Department of Natural Resources Technical Standard 1063 (Sediment Trap). Locations as directed by the engineer. General locations requiring Temporary Sediment Traps are upstream of streams and wetlands which receive sediment laden runoff. Install prior to major grading operations.

**D Measurement**

The department will measure Temporary Sediment Traps as each individual sediment trap, 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.0060.09 | Temporary Sediment Traps | EACH |

Payment is full compensation for design; furnishing and maintaining each sediment trap; for removal of the sediment trap; and for stabilization of disturbed area after removal.

1. Temporary Earth Berm, Item SPV.0060.10.

**A Description**

This item describes excavating a trench and forming a temporary earth berm to intercept sediment laden storm runoff and to retain the sediment according to applicable standard spec 205 and 628 as shown on the plans and as hereinafter provided.

**B Materials**

Use on-site soil materials.

**C Construction**

Construct, maintain and remove temporary earth berms according to the plan details.

Locations as directed by the engineer. Locations generally requiring temporary earth berms are upstream of streams or wetlands which may receive sediment laden storm runoff. Install temporary earth berms as a part of grading operations.

**D Measurement**

The department will measure Temporary Earth Berm as each individual earth berm, 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.0060.10 | Temporary Earth Berm | EACH |

Payment is full compensation for excavation and forming each earth berm; for removal of the sediment and the temporary earth berm; and for stabilization of disturbed area after removal.

1. Field Facilities Office Space, Item SPV.0060.11.

**A Description**

This special provision describes furnishing, equipping, and maintaining a field office as required in the contract at engineer-approved locations conforming to standard spec 642 and as hereinafter provided.

**B Materials**

Provide Field Facilities Office Space conforming to standard spec 642.2.1 except delete paragraphs (1), (7), and (9).

*Replace standard spec 642.2.1(4) with the following:*

Provide and maintain suitable interior sanitary facilities conforming to State and local health requirements, in clean and good working condition, and stock with sanitary supplies for the duration of the contract. Furnish office space in an existing office building or existing building converted to office space with a minimum of 1200 square feet. The facility shall have no fee parking with a minimum parking for 15 cars. The space shall include a meeting room with a minimum of 350 square feet. The exterior door(s) shall have locks in good working order and keys provided for all field staff. The office space shall be located within 2 miles of the construction project.

Equip the office as specified in standard spec 642.2.2.1 except delete paragraph (1) and (4) and add the following:

1. Five suitable office desks with drawers and locks.
2. Five ergonomically correct office chairs in working condition with at a minimum: 5-legged base with casters, seat adjustable from 15 to 22 inches from the floor with a seamless waterfall, rounded, front edge, and high backrest with no arms or adjustable arms.
3. Four 6 foot folding tables.
4. One 10 foot folding table.
5. Five 2-drawer file cabinets.
6. Three 4-shelf bookcases.
7. Twenty folding chairs.

Provide for the professional cleaning of the field office during regular business hours twice monthly. Provide clearly marked recycling and waste receptacles within the field office, and separate recycling and waste dumpsters near the field office. Cover outdoor containers to keep out rain, snow, and wind-driven debris. Provide regularly scheduled recycling and waste pick-up.

**C Construction**

Conform to standard spec 642.3 except delete paragraph (2).

**D Measurement**

The department will measure Field Facilities Office Space as each individual office, 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.0060.11 | Field Facilities Office Space | EACH |

Payment is full compensation for providing, equipping, securing, and maintaining the facility; for parking, for telecommunications equipment, installation, and service fees; and for providing bottled water, utilities, fuel, ventilation, and toilet facilities as required, either independently or jointly with the field laboratory, for the time specified in standard spec 642.3.

The department will pay for the cost of telecommunications usage fees incurred by department staff.

SER-642.2 (20160808)

1. Section Corner Monuments, Item SPV.0060.12.

**A Description**

Coordinate with Southeast Wisconsin Regional Planning Commission (SEWRPC) for the perpetuation and replacement of a section corner (Public Land Survey System – PLSS) monument.

**B Materials**

SEWRPC will provide a pre-cast monument or brass disk to be used to mark the PLSS corner.

Furnish base aggregate dense materials that conform to standard spec 305 and concrete, asphalt, topsoil or other materials depending on the surface surrounding the corner.

**C Construction**

SEWRPC will perpetuate existing section corner monument. The contractor is responsible to coordinate with SEWRPC and the WisDOT Project Manager throughout the perpetuation and replacement process. The engineer will contact SEWRPC at (262) 953‑4295 at least two weeks before starting construction operations or the preconstruction meeting to allow for section corner monument perpetuation.

Contractor must excavate and completely remove the existing monument. Contractor is responsible for providing a backfilled 3 to 4 foot deep hole where existing monument was removed. Contractor is responsible to coordinate the materials and methodology to complete the construction of the surface surrounding the monument. This may include but is not limited to a 2 foot x 2 foot "box out" or 24 inch diameter core hole in concrete, asphalt pavement/paving rings, coring to facilitate poured in place monuments, topsoil, seed and mulching or other materials or methodologies as agreed to by the contractor and SEWPRC.

**Contact Information:**

Attn: John Washburn

Southeastern Wisconsin Regional Planning Commission

W239 N1812 Rockwood Drive

P.O. Box 1607

Waukesha, WI53187-1607

Phone (262) 547-6721

Cell (262) 953-4295

Fax (262) 547-1103

Email: [jwashburn@sewrpc.org](mailto:jwashburn@sewrpc.org)

**D Measurement**

The department will measure Section Corner Monuments by each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.12 | Section Corner Monuments | EACH |

Payment is full compensation for furnishing all excavating; for removal of existing monument, for placing and compacting backfill material; for disposing of surplus materials; for concrete or asphalt material, finishing of roadway or other surfaces, and for furnishing all coordination with SEWRPC.

SER-621.1 (20170530)

1. Baseline CPM Progress Schedule, Item SPV.0060.13; Monthly CPM Progress Schedule Updates, Item SPV.0060.14.

*Replace standard spec 108.4 with the following:*

108.4 Critical Path Method Progress Schedule

108.4.1 Definitions

(1) The department defines terms used in 108.4 as follows:

Activity An administrative or construction task performed during the course of the project with a defined duration, and scheduled (or actual) start and finish dates.

Critical Path The longest continuous chain of activities through the CPM schedule that establishes the minimum overall project duration.

Construction Activity Construction activities are discrete work activities performed by the contractor, subcontractors, utilities, or third parties within the project limits.

CPM Progress Schedule A Critical Path Method (CPM) Progress Schedule is a network of logically related activities. The CPM schedule calculates when activities can be performed and establishes the critical or longest continuous path or paths of activities through the project.

Float Float, as used in this special provision, is the total float of an activity; i.e., it is the amount of time between the date when an activity can start (the early start), and the date when an activity must start (the late start). In cases where the total float of an activity has a different value when calculated based on the finish dates, the lower (more critical) value will govern.

Forecast Completion Date The completion date predicted by the latest accepted CPM Update, which may be earlier or later than the contract completion date, depending on progress.

Fragnet A group of logically-related activities, typically inserted into an existing CPM schedule to model a portion of the project, such as the work associated with a change order.

Initial Work Plan The initial work plan is a time-scaled CPM schedule showing detailed activities for the first 90 calendar days of work and summary level activities for the remainder of the project.

Intermediate Milestone Date A contractually required date for the completion of a portion of the work, so that a subsequent portion of the work or stage of traffic phasing may proceed.

Master Program Schedule The department's schedule for the overall 94 N-S Freeway Program, including intermediate milestone dates and contract completion dates, and containing codes for use as a template for the development of the contractor's schedule.

**Master Project Schedule** The department's schedule for the contract work, developed during design, and provided to the contractor for informational purposes only.

Work Breakdown Structure (WBS) A framework for organizing the activities that make up a project by breaking the project into successively greater detail by level. A WBS organizes the project work. It does not address the sequencing and scheduling of project activities.

108.4.2 Department's Master Schedules

108.4.2.1 Master Project Schedule

(1) If requested by a bidder or by the contractor, the department will supply its Master Project Schedule for the contract work, developed during design. The Master Project Schedule is not a direction on how to perform the work. The Master Project Schedule reflects one possible approach to the work, consistent with the phasing requirements.

108.4.2.2 Master Program Schedule

(1) Within five business days after award, the department will provide its current Master Program Schedule, containing intermediate milestone constraints, standard activity codes, and a standard WBS for the contractor to use to develop its schedule.

108.4.2.3 Use of Department's Master Schedules

(1) The department's Master Schedules provide information to assist the contractor in preparing its schedule. The Master Schedules are not contract documents. The logic contained in the Master Schedules is not intended to alter or supplement contract requirements for the phasing of the work, but to reflect those requirements.

108.4.3 Contractor's Scheduling Responsibilities

(1) Prepare and submit a CPM progress schedule that accurately reflects the plan for the performance of the work, based on the physical requirements of the Work, and Traffic Phasing requirements. The CPM schedule is the contractor's committed plan to complete all work within the completion deadlines. Full responsibility is assumed for the prosecution of the work as shown. The CPM schedule is not part of the contract. Schedule the Work in the manner required to achieve the completion date and intermediate milestone dates specified in the Prosecution and Progress Special Provision.

(2) Use the department-provided Master Program Schedule as a template to develop the Initial Work Plan and the Baseline CPM Progress Schedule. Use the Master Program Schedule's ID coding structure to categorize activities by Contract, Stage, Location, and Responsibility to ensure compatibility with the Master Program Schedule and with schedules prepared by other contractors. Add additional activity codes as necessary, but do not delete the coding structure provided.

(3) To ensure compatibility with the Master Program Schedule, use the latest version of Primavera P6 Project Management, by Oracle Corporation, Redwood Shores, CA, to prepare the Initial Work Plan, Baseline CPM Progress Schedule, and Monthly CPM Updates.

(4) Designate a Project Scheduler who will be responsible for scheduling the Work and submit a professional resume describing a minimum of three years of scheduling experience on urban, interstate-highway reconstruction work of similar size and complexity, including recent experience with P6.Obtain approval of the submitted resume before scheduling the work.

108.4.4 Submittals

108.4.4.1 Initial Work Plan

(1) Within ten business days after the Initial Work Plan Workshop, as scheduled in section 103.10, submit an Initial Work Plan as follows:

1. Develop the Initial Work Plan using the Master Program Schedule as a template. Identify the contemplated start and completion dates for each activity.

2. Provide a detailed plan of activities to be performed within the first 90 calendar days of the contract. Provide construction activities with durations not greater than 28 calendar days (20 business days), unless the engineer accepts requested exceptions.

3. Provide activities as necessary to depict administrative work, including submittals, reviews, and procurements that will occur within the first 90 calendar days of the contract. Show additional activities that require department review or approval. Activities other than construction activities may have durations greater than 28 calendar days (20 business days). Allow 21 calendar days (15 business days) for department review of submittals.

4. Provide summary activities for the balance of the project. Summary activities may have durations greater than 28 calendar days (20 business days).

5. Submit three copies of the Initial Work Plan in a compressed (XER) format on three separate CDs.

6. The engineer will accept the contractor's Initial Work Plan or provide comments within five business days after receipt of the Initial Work Plan. Address comments and resubmit the Initial Work Plan as necessary. Do not begin work until the engineer accepts the Initial Work Plan. The department will use the initial work plan to monitor the progress of the work until the Baseline CPM Progress Schedule is accepted.

7. Submit an updated version of the Initial Work Plan monthly until the engineer accepts the Baseline CPM Progress Schedule. With each update, include actual start dates, completion percentages, and remaining durations for activities started but not completed. Include actual finish dates for completed activities.

8. Ensure the Initial Work Plan shows completing the work within the interim completion dates and specified completion date.

9. Include activities that describe essential features of the work and activities that might potentially delay contract completion. Identify activities that are controlling items of work.

108.4.4.2 Baseline CPM Progress Schedule

(1) Within 15 business days after the CPM Scheduling Workshop, as scheduled in section 103.10, submit a Baseline CPM Progress Schedule and written narrative. The department will use the schedule to monitor the progress of the work.

1. Develop the Baseline CPM using the Master Program Schedule as a template. The Baseline CPM is the contractor's committed plan to complete the Work within the time frames required to achieve the contract completion date and intermediate milestone dates.

1.1. Provide a detailed plan of activities to be performed during the entire contract duration, including all administrative and construction activities required to complete the work as described in the contract documents. Provide construction activities with durations not greater than 28 calendar days (20 business days), unless the engineer accepts requested exceptions.

1.2. Provide activities as necessary to depict administrative work, including submittals, reviews, procurements, inspections, and all else necessary to complete the work as described in the contract documents. Activities other than construction activities may have durations greater than 28 calendar days (20 business days). Allow 21 calendar days (15 business days) for department review of submittals.

1.3. Submit a temporary drainage plan showing the interface between various stages of a project as well as the interface with adjacent projects.

1.4. Include activities that describe essential features of the work and activities that might potentially delay contract completion. Identify activities that are controlling items of work.

1.5. Show completing the work within interim completion dates and the specified completion date.

1.6. Provide summary activities for the balance of the project. Summary activities may have durations greater than 28 calendar days (20 business days).

1.7. Provide activities as necessary to depict third party work related to the contract.

1.8. Make allowance for specified work restrictions, non-working days, time constraints, calendars, and weather; and reflect involvement and reviews by the department, and coordination with adjacent contractors, utility owners, and other third parties.

1.9. With the exception of the Project Start Milestone and Project Completion Milestone, all activities must have predecessors and successors. The start of an activity shall have a Start-to-Start or Finish-to-Start relationship with preceding activities. The completion of an activity shall have a Finish-to-Start or Finish-to-Finish relationship with succeeding activities. Do not use Start-to-Finish relationships. Do not use Finish-to-Start relationships with a lag unless the engineer accepts requested exceptions.

1.10. Schedule all intermediate milestones in the proper sequence and input as either a "Start-no-Earlier-Than" or "Finish-no-Later-Than" date. Provide predecessors and successors for each intermediate milestone as necessary to model each Stage of the Work. Unless the engineer accepts a requested exception, the schedule should encompass all the time in the contract period between the starting date and the specified completion date.

1.11. Using the bid quantities and unit prices, develop an anticipated cash-flow curve for the project, based on the Baseline CPM.

2. Provide three hard copies of a hand-drawn or electronically drafted logic diagram depicting the CPM network. Organize the logic diagram by grouping related activities, based on the activity codes in the CPM.

3. Provide a written narrative with the baseline CPM explaining the planned sequence of work, as-planned critical path, critical activities for achieving intermediate milestone dates, traffic phasing, and planned labor and equipment resources. Use the narrative to further explain:

3.1. The basis for activity durations in terms of production rates for each major type of work (number of shifts per day and number of hours per shift), and equipment usage and limitations.

3.2. Use of constraints.

3.3. Use of calendars.

3.4. Estimated number of adverse weather days on a monthly-basis.

3.5. Scheduling of permit and environmental constraints, and coordination of the schedule with other contractors, utilities, and public entities.

(1) Submit three copies of the Baseline CPM in a compressed (XER) format on three separate CDs.

(2) Within ten business days of receiving the Baseline CPM, the engineer will provide comments and schedule a meeting for the contractor to present its Baseline CPM and answer questions raised in the engineer's review.

(3) At the meeting scheduled by the engineer, provide a presentation of the Baseline CPM. In the presentation, include a discussion of the staging and sequencing of the work, understanding of traffic phasing, and application of labor and equipment resources to the Work. Address comments raised in the engineer's review.

(4) Within five business days after the meeting, the engineer will accept the contractor's Baseline CPM schedule or provide comments. Address the engineer's comments and resubmit a revised Baseline CPM within ten business days after the engineer's request. If the engineer requests justification for activity durations, provide information that may include estimated labor, equipment, unit quantities, and production rates used to determine the activity duration.

(5) The department will only make progress payments for the value of materials, as specified in 109.6.3.2, until the contractor has submitted the Baseline CPM Schedule. The department will retain 10 percent of each estimate until the department accepts the Baseline CPM Schedule.

(6) The engineer will accept the Baseline CPM based solely on whether the schedule is complete as specified in this section. The engineer's acceptance of the schedule does not modify the contract or validate the schedule.

(7) The department will not consider requests for contract time extensions as specified in 108.10 or additional compensation for delay specified in 109.4.7 until the department accepts the Baseline CPM schedule.

108.4.4.3 Monthly CPM Updates

(1) Submit CPM Updates on a monthly basis after acceptance of the Baseline CPM as follows:

1. Include actual start dates, completion percentages, and remaining durations for activities started but not completed, and actual finish dates for completed activities, through the final acceptance of the project.

2. Include additional activities as necessary to depict additions to the contract by changes and logic revisions as necessary to reflect changes in the contractor's plan for prosecuting the work.

3. Include a narrative report that includes a brief description of monthly progress, changes to the critical path from the previous update, sources of delay, potential problems, work planned for the next 30 calendar days, and changes to the CPM schedule. Changes to the logic of the CPM schedule include the addition or deletion of activities and changes to activity descriptions, original durations, relationships, constraints, calendars, or previously recorded actual dates. Justify changes to the CPM schedule in the narrative by describing associated changes in the planned methods or manner of performing the work or changes in the work itself.

4. Submit three copies of each CPM Update in a compressed (XER) format electronically, as agreed to with the department.

5. If additions or changes were made to the CPM schedule since the previous update, submit an updated hard copy of the revised logic diagram.

(2) Within five business days of receiving each CPM Update, the engineer will provide comments and schedule a meeting as necessary to address comments raised in the engineer's review. Address the engineer's comments and resubmit a revised CPM Update within five business days after the engineer's request.

108.4.4.4 Three-Week Look-Ahead Schedules

(1) Submit Three-Week Look-Ahead Schedules on a weekly basis after the notice to proceed (NTP). The schedule can be hand drawn or generated by computer. With each Three-Week Look-Ahead include:

1. Activities underway and as-built dates for the past week.

2. Actual as-built dates for completed activities through final acceptance of the project.

3. Planned work for the upcoming two-week period.

4. The activities underway and critical RFIs and submittals, based on the CPM schedule.

5. Details on other activities not individually represented in the CPM schedule.

(2) On a weekly basis, the department and the contractor shall agree on the as-built dates depicted in the Three-Week Look-Ahead schedule or document all disagreements. Use the as-built dates from the Three-Week Look-Ahead schedules for the month when updating the CPM schedule.

108.4.4.5 Weekly Production Data

(1) Provide estimated and actual weekly production rates for items of work on a weekly basis as follows:

1. Data on the following items by area or station:

1.1. Retaining Walls

1.1.1. Leveling Pads - LF

1.1.2. Set Panels - SF

1.1.3. Parapets - LF

1.1.4. Wall Face - Bay

1.1.5. Tie Backs – Each

1.1.6. Anchor Slabs – LF

1.1.7. Drilling - Each

1.1.8. Coping – LF

1.1.9. Footing - LF

1.2. Bridge Construction

1.2.1. Footings—Each

1.2.2. Columns—Each

1.2.3. Abutments—Each

1.2.4. Pier Caps—Each

1.2.5. Girder Spans – Each

1.2.6. Decked Spans – Each

1.2.7. Poured Spans – Each

1.3. Roadway Excavation—CY per week

1.4. Roadway Structural Section

1.4.1. Grading/Subgrade Preparation—SY

1.4.2. Base Material Placement—Ton

1.4.3. Base Material Subgrade Preparation—SY

1.4.4. Asphalt Pavement—Ton

1.4.5. Concrete Pavement – SY

1.5. Tunnels

1.5.1. Drilled Shafts – Each

1.5.2. Beam Seat/Cap - LF

1.5.3. Girders - Each

1.5.4. Deck – Percent

1.6. Noise Walls

1.6.1. Drill/Set Ground Mounted Posts - Each

1.6.2. Install Ground Mounted Panels - Each

1.6.3. Anchor/Set Structure Mounted Posts - Each

1.6.4. Install Structure Mounted Panels - Each

2. The actual daily production for the past week and the anticipated weekly production for the next week.

(2) Submit the data in an electronic spreadsheet format at the same time the Three-Week Look-Ahead is submitted. On a weekly basis, the department and the contractor shall agree on the production data or document all disagreements.

108.4.5 Progress Review Meetings

108.4.5.1 Weekly Progress Review Meetings

(1) After completing the weekly submittal of the Three-Week Look-Ahead and production data, attend a weekly meeting to review the submittals with the department. At the meeting, address comments as necessary, and document agreement or disagreement with the department.

108.4.5.2 Monthly Update Review Meetings

(1) After submitting the monthly update and receiving the engineer's comments, attend a job-site meeting, as scheduled by the engineer, to review the progress of the schedule. At that meeting, address comments as necessary, and document agreement or disagreement with the department. The monthly meeting will be coordinated to take place on the same day and immediately before or after a weekly meeting, whenever possible.

108.4.6 CPM Progress Schedule Revisions

(1) Revision by the contractor if necessary due to changes in the Work or project conditions and authorized by the engineer, a CPM Progress Schedule Revision may be submitted, although the next Monthly CPM Update is not yet due. Prepare the CPM Revision in the same format as required for Monthly CPM Updates, including justification for changes to the schedule. The process for comment and acceptance of a CPM Revision will be the same as for Monthly CPM Updates. If the CPM Revision is accepted, prepare the next monthly update based on the revised CPM. If the CPM Revision is rejected, prepare the next monthly update based on the previous month's update.

(2) Engineer's Right to Request Revisions—The engineer will monitor the progress of the work and may request revisions to the CPM schedule. Revise the schedule as requested by the engineer, and submit a CPM Progress Schedule Revision within ten business days of the request. The process for comment and acceptance of a CPM Revision will be the same as for Monthly CPM Updates. The engineer may request that the contractor revise the CPM schedule for one or more of the following reasons:

1. The forecast completion date is scheduled to occur more than 14 calendar days after the contract completion date.

2. An intermediate milestone is scheduled to occur more than 14 calendar days after the date required by the contract.

3. The engineer determines that the progress of the work differs significantly from the current schedule.

4. A contract change order requires the addition, deletion, or revision of activities that causes a change in the contractor's work sequence or the method and manner of performing the work.

108.4.7 Documentation Required for Time Extension Requests

(1) To request a time extension to an intermediate milestone date or the contract completion date associated with changes to the work, provide a narrative detailing the work added or deleted and the other activities affected, based on the latest accepted CPM Update. For added work, submit a proposed fragnet of activities to be added or revised in the CPM schedule, indicating how the fragnet is to be tied to the CPM schedule.

(2) To request a time extension to an intermediate milestone date or the contract completion date associated with delays to the work, provide a narrative detailing the affected activities and the cause of the delay, based on the latest accepted CPM Update. Requests for time extensions due to delays should meet the following criteria:

1. For requests to extend the contract completion date, include a description of how the delay affected the project's critical path, based on the latest accepted CPM Update.

2. For requests to extend an intermediate milestone date, include a description of how the delay affected the controlling (longest) path to the milestone, based on the latest accepted CPM Update.

3. The department and the contractor agree that the float is not for the exclusive use or financial benefit of either party. Either party has the full use of the float on a first come basis until it is depleted.

108.4.8 Payment for CPM Progress Schedule

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

ITEM NUMBER DESCRIPTION UNIT

SPV.0060.13 Baseline CPM Progress Schedule EACH

SPV.0060.14 Monthly CPM Progress Schedule Updates EACH

(2) The department will only make progress payments for the value of materials, as specified in 109.6.3.2.1, until the Baseline CPM schedule has been submitted. The department will retain ten percent of each estimate until the department accepts the Baseline CPM schedule.

(3) The department will only make progress payments for the value of materials, as specified in 109.6.3.2.1, until the Monthly CPM schedule updates have been submitted. The department will retain ten percent of each estimate until the department accepts the Monthly CPM schedule update.

(4) Payment is full compensation for all work required under these bid items. The department will pay the contract unit price for the Baseline CPM schedule after the department accepts the schedule. Then, the department will pay the contract unit price for each Monthly CPM Update acceptably completed.

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1. Tieback Anchors, Item SPV.0060.20; Tieback Anchor Performance Tests, Item SPV.0060.21.

**A Description**

**A.1 General**

(1) The work under this item consists of permanent, pressure-grouted or post grouted, ground anchors designed, furnished, installed, tested, and stressed according to these special provisions and as shown on the plans.

(2) Install ground anchors that shall develop the load carrying capacity indicated on the plans according to the testing subsection of these special provisions.

(3) The contractor has the option to provide an alternate permanent earth anchor system with the approval of the department. The contractor shall then be responsible for selecting the permanent earth anchor type, method of installation, and for determining the bond length and anchor diameter that shall develop the factored design loads indicated on the plans. The analysis, design, construction and testing of the post tiebacks shall conform to the AASHTO LRFD Bridge Design Specifications Seventh Edition with 2015 Interim and the AASHTO LRFD Bridge Construction Specifications Third Edition with 2015 Interim.

**A.2 Qualifications of the Contractor**

(1) The contractor performing the work described in these special provisions must have installed ground anchors for excavation retaining walls for a minimum of 5 years. Submit a list containing at least five projects where the contractor has installed ground anchors. Specifically, experience must demonstrate competence in the use of pressure or post grouting. At least one project must show evidence of permanence with a 5-year minimum age. The project experience documentation must include a brief project description, construction methods used during installation, local soil conditions, actual construction time and contact information consisting of an individual’s name and current phone number. Contacts must be capable of verifying project participation.

(2) Submit staff experience records of the engineer, drill operators, and on-site supervisors who will be assigned to the project. The staff records must contain a summary of each individual’s experience and it must be complete enough for the engineer to determine whether each individual has satisfied the following qualifications.

(3) Assign an engineer to supervise the work who has at least four years of experience in the design and construction of anchored earth retaining structures in similar soils. Do not use consultants or manufacturer’s representatives in order to meet the requirements of this section. Drill operators and on‑site supervisors must have a minimum of one-year experience installing ground anchors with the contractor’s organization.

(4) Submit your qualifications and staff experience records at the preconstruction meeting or 21 calendar days prior to the start of ground anchor installation, whichever date is earlier. The engineer will approve or reject the contractor’s qualifications and staff experience records within 14 calendar days after receipt of the submission. Do not start work on any ground anchor installation until approval of the contractor’s qualifications and staff experience are given by the engineer. The engineer may suspend the ground anchor work if the contractor substitutes unqualified personnel for approved personnel during construction. If work is suspended due to the substitution of unqualified personnel, the adjustment in contract time resulting from the suspension of work will not be allowed.

**A.3 Submittals**

(1) Prepare and submit to the engineer for review and approval working drawings and a design submission describing the ground anchor system or systems intended for use. The working drawings and design submission must be submitted thirty business days before the commencement of the ground anchor work. The working drawing and design submission must include certificates of compliance for the following materials, if used. The certificates must state that the material or assemblies to be provided will fully comply with the requirements of the contract.

* Prestressing steel or bar;
* Portland cement;
* Prestressing hardware;
* Bearing plates.

(2) The engineer will approve or reject the contractor’s submittals within 30 business days after receipt of the submission.

(3) Submit to the engineer for review and approval or rejection mill test reports for the prestressing steel and the bearing plate steel. The engineer may require the contractor to provide samples of any ground anchor material intended for use on the project. The engineer will approve or reject the prestressing steel and bearing plate steel within five business days after receipt of the test reports. Do not incorporate the prestressing steel and bearing plates in the work without the engineer’s approval.

(4) Submit to the engineer for review and approval or rejection calibration data for each test jack, pressure gauge and reference pressure gauge to be used. The engineer will approve or reject the calibration data within five business days after receipt of the data. Do not commence testing until the engineer has approved the jack, pressure gauge, and reference pressure gauge calibrations.

(5) Submit to the engineer within 10 calendar days after completion of the ground anchor work, a report containing the following information:

* As-Built plans showing the location and vertical and horizontal orientation of the tiebacks, capacity, tendon type, total length, and unbonded length as installed.
* Steel tendon, corrosion protection elements and grout certifications and/or mill reports.
* Grouting records indicating the following:
  + 1. Cement type;
    2. Cube test strength results;
    3. Grout volume for bonded and unbonded lengths;
    4. Grout pressure.
* Show on the as-built plans the type of testing performed for each post tieback.
* Tieback tests results (Performance and proof test data with load-anchor elongation curves).
* Other records as required by standard spec 106.

**A.4 Definitions**

(1) Anchorage Devices. The anchor head wedges or nuts, which grip the prestressing steel.

(2) Bearing Plate. The steel plate, which distributes the ground anchor force to the structure.

(3) Bond Length. The length of the ground anchor, which is bonded to the ground and transmits the tensile force to the soil or rock.

(4) Factored Design Load. The factored design load is the maximum anticipated factored load that will be applied to the ground anchor during its service life after stressing and testing have been completed. Design loads and applicable load factors are per AASHTO LRFD Bridge Design Specifications, Fifth Edition with 2010 Interim.

(5) Ground Anchor. A system, referred to as a tieback or an anchor, used to transfer tensile loads to soil or rock. A ground anchor includes all prestressing steel, anchorage devices, bearing plates, grout, coatings, corrosion protection, and sheathings and couplers if used.

(6) Minimum Specified Ultimate Tensile Strength. The minimum breaking strength of the prestressing steel as defined by the specified standard.

(7) Tendon Bond Length. The length of the tendon, which is bonded to the anchor grout.

(8) Total Anchor Length. The unbonded length plus the tendon bond length.

(9) Unbonded Length. The length of the tendon, which is not bonded to the grout. The grout surrounding the unbonded length is a void filler and provides corrosion protection.

**B Materials**

**B.1 References**

(1) **AASHTO Standards**

* M85 Portland Cement
* M183 Structural Steel
* M275 Threadbar Prestressing Steel
* M203 Seven-wire, low relaxation strands
* M222 High-Strength Low-alloy Structural Steel with 50,000 psi Minimum Yield Point to 4 Inches Thick
* M252 Corrugated Polyethylene Drainage Tubing

(2) **ASTM Standards**

* A-53 Specification for Steel Pipe
* A-252 Specification for Welded and Seamless Steel Pipe Files
* A-500 Specification for Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
* A-722 Threadbar Prestressing Steel
* A-779 Compact Seven-wire, low relaxation strands
* D-1248 Specification for Welded and Seamless Steel Pipe Files
* D-1784 Specification for Rigid Poly Vinyl Chloride (PVC) Compounds and Chlorinated Poly Vinyl Chloride (CPVC) Compounds
* D-4101 Specification for Propylene Plastic Injection and Extrusion Materials

(3) **Post-Tensioning Institute Standards**

* “Guide Specification for Post-Tensioning Materials,” Post-Tensioning Manual, Post Tensioning Institute, 6th Edition, 2006.
* “Specification for Unbonded Single Strand Tendons,” Post-Tensioning Institute, 2nd Edition, 2003.
* “Recommendations for Prestressed Rock and Soil Anchors,” Post-Tensioning Institute, 4th Edition, 2004.

**B.2 Tieback Anchors**

(1) Admixtures that control bleed, improve flowability, reduce water content, and retard set may be used in the grout subject to the approval of the engineer. Expansive admixtures may only be added to the grout used for filling sealed encapsulations, trumpets, and anchorage covers. Accelerators are not permitted. Admixtures, if used, must be compatible with the prestressing steels and mixed according to the manufacturer’s recommendations.

(2) Fabricate exposed anchorage covers from steel or ductile cast iron with a minimum thickness of 0.10 inches. Securely attach the cover to the anchorage device or bearing plate. If the cover is to be grease filled, then the cover must form a permanent watertight enclosure for the anchorage device.

(3) Use anchorage devices capable of developing 95 percent of the minimum specified ultimate tensile strength of the prestressing steel tendon. The anchorage devices must conform to the static strength requirements of section 3.1.6 (1) and section 3.1.8 (1) of the PTI “Guide Specification for Post-Tensioning Materials”.

(4) Fabricate the bearing plate from steel conforming to ASTM A572 Grade 50 or AASHTO M223 Grade 50 specifications.

(5) Fabricate the bondbreaker from a smooth plastic tube or pipe having the following properties:

* Resistant to chemical attack from aggressive environments, grout or grease.
* Resistant to aging by ultra-violet light.
* Fabricated from material nondetrimental to the tendon or bar.
* Capable of withstanding abrasion, impact, and bending during handling and installation.
* Enable the tendon to elongate during testing and stressing.
* Allow the tendon to remain unbonded after lock-off.

(6) Use Type I, II, or III Portland cement conforming to AASHTO M85 for grout. The corrosion inhibiting grease must conform to the requirements of section 3.2.5 of the PTI, “Specification for Unbonded Single Strand Tendons”.

(7) Fabricate heat shrinkable tubes from a radiation crosslinked polyolefin tube internally coated with an adhesive sealant. Before shrinking, the tube must have a nominal wall thickness of 24 mils. The adhesive sealant inside the tube must have a nominal thickness of 20 mils.

(8) Fabricate ground anchor tendons from a single bar. Additionally, the ground anchor tendons must conform to the following:

* Steel bars conforming to AASHTO M275, or ASTM A722.
* Seven-wire, low relaxation strands conforming to M203.

(9) Use steel couplers capable of developing 95 percent of the minimum specified ultimate tensile strength of the tendon.

(10) Use a sheath as part of the corrosion protection system for the unbonded length portion of the tendon. Fabricate the sheath from one of the following:

* A polyethylene tube pulled or pushed over the prestressing steel. The polyethylene must be Type II, III, or IV as defined by ASTM D-1248 (or approved equal). The tubing must have a minimum wall thickness of 60 mils plus/minus 10 mils.
* A hot-melt extruded polypropylene tube. The polypropylene must be cell classification PP 210 B5554211 as defined by ASTM D-4101 (or approved equal). The tubing must have a minimum wall thickness of 60 mils plus/minus 10 mils.
* A hot-melt extruded polyethylene tube. The polyethylene must be high density Type III as defined by ASTM D-3350 and ASTM D1248 (or approved equal). The tubing must have a minimum wall thickness of 60 mils plus/minus 10 mils.
* Steel tubing conforming to ASTM A-500, minimum wall thickness of 0.20 inches.
* Steel pipe conforming to ASTM A-53, Schedule 40 minimum.
* Plastic pipe conforming to ASTM A-1185, Schedule 40 minimum.
* A corrugated tube conforming to the requirement of the tendon bond length encapsulation.

(11) Spacers must permit grout to freely flow up the drill hole. Fabricate spacers from plastic, steel, or material that is nondetrimental to the prestressing steel. Do not use wood. A combination centralizer-spacer may be used.

(12) Fabricate the trumpet used to provide a transition from the anchorage to the unbonded length corrosion protection from a steel pipe or tube conforming to the requirements of ASTM A-53 for pipe or ASTM A-500 for tubing. The trumpet must have a minimum wall thickness of 0.125 inches for diameters up to four inches and 0.20 inches for larger diameters.

(13) Use potable water for mixing grout.

(14) Fabricate tendons according to the following specifications:

* The tendons may be either shop or field fabricated from prestressing steel and materials conforming to the requirements of the Materials subsection of these special provisions. Fabricate the tendon as shown on the approved working drawings.
* The cement grout cover must provide corrosion protection of the tendon.
* Position spacers so their center-to-center spacing does not exceed ten feet. In addition, locate the upper spacer a maximum of five feet from the top of the tendon bond length, and locate the lower spacer a maximum of five feet from the bottom of the tendon bond length.
* The minimum unbonded length of the bar tendon must be 15 feet or as indicated on the plans or the approved working drawings, whichever is greater. The unbonded length must extend a minimum of 5 feet beyond the critical failure surface measured from the lowest subgrade level from the back of the retaining wall in the soil mass being retained by the wall. If the entire drill hole (tendon bond length and unbonded length) is grouted in one operation, then for the corrosion protection of the unbonded length provide either a sheath completely filled with corrosion inhibiting grease or grout, or a heat shrinkable tube internally coated with an elastic adhesive. If grease is used under the sheath, make provisions to prevent the grease from escaping at the ends of the sheath. The grease must completely coat the tendon, fill the void between the tendon and the sheath, and fill the interstices between the wires of the seven-wire strands. Provide a transition between the bond length and the unbonded length corrosion protection as illustrated in the working drawings. If the sheath is grout filled, a separate bond breaker must be provided. The bond breaker must prevent the tendon from bonding to the grout surrounding the unbonded length. If a grease-filled sheath corrosion protection is provided and the drill hole above the bond length is grouted after the ground anchor has been locked off, then grout the tendon inside a second sheath.
* The total anchor length must not be less than the minimum length indicated on the plans or the approved working drawings.
* Size the bearing plates so that:

1. The bending stresses in the plate do not exceed the yield strength of the steel when a load equal to 95 percent of the minimum specified ultimate tensile strength of the tendon is applied;

2. The average bearing stress on the concrete does not exceed that recommended in section 3.1.7 of the PTI, “Guide Specification for Post-Tensioning Materials”.

* Weld the trumpet to the bearing plate. The trumpet must have an inside diameter equal to or larger than the hole in the bearing plate. The trumpet must be long enough to accommodate movements of the structure during testing and stressing. For strand tendons with encapsulation over the unbonded length, the trumpet must be long enough to enable the tendon to make a transition from the diameter of the tendon in the unbonded length to the diameter of the tendon at the anchor head without damaging the encapsulation. Trumpets filled with corrosion-inhibiting grease must have a permanent Buna-N synthetic rubber or approved equal seal provided between the trumpet and the unbonded length corrosion protection. Trumpets filled with grout must have a temporary seal provided between the trumpet and the unbonded length corrosion protection or the trumpet must overlap the unbonded length corrosion protection by a minimum of one foot and fit tightly over the unbonded length corrosion protection.

(15) Damage to the prestressing steel because of abrasions, cuts, nicks, welds and weld splatter will be cause for rejection by the engineer. Protect the prestressing steel if welding is to be performed in the vicinity. Grounding of welding leads to the prestressing steel is forbidden. Protect the prestressing steel from dirt, rust or deleterious substances. If heavy corrosion or pitting is noted, the engineer will reject the affected tendons.

(16) Use care in handling and storing the tendons at the site. Before inserting a tendon in the drill hole, the contractor and the engineer will examine the tendon for damage to the encapsulation and the sheathing. If, in the opinion of the engineer, the smooth sheathing has been damaged, repair it with ultra-high molecular weight polyethylene tape.

**C Construction**

**C.1 Anchor Installation**

**C.1.1 General**

(1) Unless otherwise directed, select the drilling method, pressure grouting, post grouting, the grouting procedure, and the grouting pressure used for the installation of the ground anchor.

**C.1.2 Drilling Method**

(1) Unless otherwise directed, the contractor may choose to utilize rotary drilling with casing, duplex or dual rotary drilling method, rotary drilling with stabilizing fluid, percussion drilling with casing, hollow stem auger drilling or driven casing provided that the anchor hole is maintained in a stable condition at all times, preventing collapse or excessive over‑excavation of soils. Pervasive hole caving or ground loss problems must be repaired by grouting at the contractor’s expense to prevent damage to the adjacent ground mass and supported structures.

(2) Use duplex drilling when drilling anchors in predominately granular soils, soils below the ground water table, or when directed by the engineer to use duplex drilling when other drilling methods do not produce satisfactory results.

(3) At the ground surface, locate the drill hole within twelve inches of the location shown on the plans or the approved working drawings. Locate the drill hole so the longitudinal axis of the drill hole and the longitudinal axis of the tendon are parallel. In particular, do not drill the ground anchor hole in a location that requires the tendon to be bent in order to enable the bearing plate to be connected to the supported structure. At the point of entry, the horizontal angle made by the ground anchor and the structure must be within plus/minus three degrees of a line drawn perpendicular to the plane of the structure unless otherwise shown on the plans or approved working drawings. Do not extend the ground anchors beyond the right-of-way or easement limits shown on the plans.

(4) The tendon must be inserted into the drill hole to the desired depth without difficulty. When the tendon cannot be completely inserted, remove the tendon from the drill hole and clean or redrill the hole to permit insertion. Do not drive or otherwise force partially inserted tendons into the hole.

**C.1.3. Grouting Method**

(1) Use a neat cement grout. The cement must not contain lumps or other indications of hydration. Admixtures, if used, must be mixed according to the manufacturer’s recommendations.

(2) Use grouting equipment that produces a grout free of lumps and undispersed cement. Use a positive displacement grout pump. The pump must be equipped with a pressure gauge in order to monitor grout pressures. The pressure gauge must be capable of measuring pressures of at least 150 psi or twice the actual grout pressures used by the contractor whichever is greater. The grouting equipment must be sized to enable the grout to be pumped in one continuous operation. The mixer must be capable of continuously agitating the grout.

(3) Inject the grout from the lowest point of the drill hole. The grout may be pumped through grout tubes, casing, hollow-stem-augers, or drill rods. The grout may be placed before or after insertion of the tendon. Record the quantity of the grout and record the grout pressures. The grout pressures and grout takes must be controlled to prevent uncontrolled heave or fracturing.

(4) The grout above the top of the bond length may be placed at the same time as the bond length grout but it may not be placed under pressure. The grout at the top of the drill hole must not contact the back of the structure or the bottom of the trumpet.

(5) Upon completion of grouting and post grouting, the grout tube may remain in the hole but it shall be filled with grout. Do not load the tendon for a minimum of three days after grouting.

**C.2 Installation of Trumpet and Anchorage**

(1) The corrosion protection surrounding the unbonded length of the tendon must extend up beyond the bottom seal of the trumpet or one foot into the trumpet if no trumpet seal is provided. If the protection does not extend beyond the seal or sufficiently far enough into the trumpet, extend the corrosion protection or lengthen the trumpet.

(2) The corrosion protection surrounding the unbonded length of the tendon must not contact the bearing plate or the anchor head during testing and stressing. If the protection is too long, trim the corrosion protection to prevent contact.

(3) Completely fill the trumpet with corrosion inhibiting grease or grout. Trumpet grease can be placed any time during construction. Place trumpet grout after the ground anchor has been tested and stressed. Demonstrate to the engineer that the procedures selected for placement of either grease or grout will produce a completely filled trumpet.

(4) Cover all anchorages permanently exposed to the atmosphere with a corrosion inhibiting grease-filled or grout‑filled cover. Demonstrate to the engineer that the procedures selected for placement of either grease or grout will produce a completely filled cover.

**C.3 Anchor Testing**

**C.3.1 General**

(1) Test each ground anchor. Do not apply any load greater than 10 percent of the factored design load to the ground anchor prior to testing. The maximum test load must not exceed 80 percent of the minimum specified ultimate tensile strength of the tendon. The test load must be simultaneously applied to the entire tendon. Stressing of single elements of multi-element tendons is not permitted.

(2) Supply the following testing equipment:

* A dial gauge or veneer scale capable of measuring to 0.01 inches used to measure the ground anchor movement. The movement-measuring device must have a minimum travel equal to the theoretical elastic elongation of the total anchor length at the maximum test load and it must have adequate travel so the ground anchor movement may be measured without resetting the device.
* A hydraulic jack and pump used to apply the test load. The jack and a calibrated pressure gauge must be used to measure the applied load. The jack and pressure gauge must be calibrated as a unit by an independent firm. The calibration must have been performed within forty-five business days of the date submitted. Testing cannot commence until the engineer has approved the calibration. The pressure gauge must be graduated in 100-psi increments or less. The ram travel of the jack must not be less than the theoretical elastic elongation of the total anchor length at the maximum test load.
* A calibrated reference pressure gauge must also be kept at the site. Calibrate the reference gauge with the test jack and pressure gauge.
* Provide an electrical resistance load cell and readout for use when performing a creep test.
* Place the stressing equipment over the ground anchor tendon in such a manner that the jack, bearing plates, load cells and stressing anchorage are axially aligned with the tendon and the tendon is centered within the equipment.

**C.3.2 Performance Tests**

(1) Install and conduct the performance tests. The anchors for the performance test must be similar to the production anchors shown on the plans, and must be selected as directed by the engineer. Record the encountered soil information through the entire depth of drilling holes. Submit performance test results and soil information to the engineer for approval. If the tested anchor(s) fail(s) to pass the performance tests, at least five workdays shall be allowed for the engineer to evaluate the test anchor(s) and the soil condition. Additional performance tests may be required upon request from the engineer. The additional performance test(s), as required, and time for the engineer to evaluate the test anchor(s), will be included in the work and will not be paid for separately. Do not order material for production anchors until the approval of the performance test results are given.

(2) Conduct performance tests according to the following procedures on five percent of the ground anchors or a minimum of three ground anchors per wall, whichever is greater. The engineer will select the ground anchors to be performance tested. Test the remaining ground anchors according to the proof test procedures.

(3) Conduct performance tests by incrementally loading and unloading the ground anchor according to the following schedule. Raise the load from one increment to another immediately after recording the ground anchor movement. Measure and record the ground anchor movement to the nearest 0.01 inches with respect to an independent fixed reference point at the alignment load and at each increment of load. Monitor the load with a pressure gauge. Place the reference pressure gauge in series with the pressure gauge during each performance test. If the load determined by the reference pressure gauge and the load determined by the pressure gauge differ by more than ten percent, recalibrate the jack, pressure gauge and reference pressure gauge at no expense to the department. At load increments other than the maximum test load, hold the load just long enough to obtain the movement reading.

(4) **Performance Test Schedule**

|  |
| --- |
| **Load** |
| AL |
| 0.20 FDL\* |
| AL |
| 0.20 FDL |
| 0.40 FDL\* |
| AL |
| 0.20 FDL |
| 0.40 FDL |
| 0.60 FDL\* |
| AL |
| 0.20 FDL |
| 0.40 FDL |
| 0.60 FDL |
| 0.75 FDL |
| AL |
| 0.20 FDL |
| 0.40 FDL |
| 0.60 FDL |
| 0.75 FDL |
| 1.00 FDL\* |
| AL |
| 0.20 FDL |
| 0.40 FDL |
| 0.60 FDL |
| 0.75 FDL |
| 0.90 FDL |
| 1.15 FDL\* (Max. test load) |
| Reduce to lock-off load – 0.60 FDL |

Where, AL = Alignment Load

FDL = Factored Design Load for Tieback

\* = Graph required

(5) Hold the maximum test load in a performance test for ten minutes. Repump the jack as necessary in order to maintain a constant load. Start the load-hold period as soon as the maximum test load is applied. Measure and record at 1, 2, 3, 4, 5, 6, and 10 minutes the ground anchor movement with respect to a fixed reference. If the ground anchor movement between one minute and ten minutes exceeds 0.04 inches, hold the maximum test load for an additional 50 minutes. If the load-hold period is extended, record the ground anchor movement at 15, 20, 25, 30, 45 and 60 minutes.

(6) Plot the ground anchor movement versus load for each load increment marked with an asterisk (\*) in the performance test schedule and plot the residual movement of the tendon at each alignment load verses the highest previously applied load.

**C.3.3 Proof Tests**

(1) Perform the proof test by incrementally loading the ground anchor according to the following schedule. Raise the load from one increment to another immediately after recording the ground anchor movement. Measure and record the ground anchor movement to the nearest 0.01 inches with respect to an independent fixed reference point at the alignment load and at each increment of load. Monitor the load with a pressure gauge. At load increments other than the maximum test load, hold the load just long enough to obtain the movement reading.

(2) Hold the maximum test load in a proof test for ten minutes. Repump the jack as necessary in order to maintain a constant load. Start the load-hold period as soon as the maximum test load is applied. Measure and record the ground anchor movement with respect to a fixed reference at 1, 2, 3, 4, 5, 6, and 10 minutes. If the ground anchor movement between 1 minute and 10 minutes exceeds 0.04 inches, hold the maximum test load for an additional 50 minutes. If the load-hold period is extended, record the ground anchor movements at 15, 20, 25, 30, 45 and 60 minutes.

(3) **Proof Test Schedule**

|  |
| --- |
| **Load** |
| AL |
| 0.20 FDL |
| 0.40 FDL |
| 0.60 FDL |
| 0.75 FDL |
| 1.00 FDL |
| 1.15 FDL (Max. test load) |
| Reduce to lock-off load – 0.60 FDL |

Where, AL = Alignment Load

FDL = Factored Design Load for Tieback

(4) Plot the ground anchor movement versus load for each load increment in the proof test.

(5) Submit proof tests for review by the engineer within 7 days of testing.

**C.3.4 Ground Anchor Load Test Acceptance Criteria**

(1) A performance- or proof-tested ground anchor with a 10-minute load-hold period is acceptable if the:

* The tieback resists the maximum test load with less than 0.04-inches of movement between 1 minute and 10 minutes.
* The total elastic movement of the tendon measured at the anchor head obtained from a proof or performance test must exceed 80 percent of the theoretical elastic elongation of the stressing or unbonded length for load increments 0.25 DL and above.
* The total movement of tendon must not exceed 100 percent of the theoretical elastic elongation of the unsupported length plus 50 percent of the supported length.

(2) A performance- or proof-tested ground anchor with a 60-minute load-hold period or a creep-tested ground anchor is acceptable if the:

* Ground anchor carries the maximum test load with a creep rate that does not exceed 0.08 inches/log cycle of time; and
* Total movement at the maximum test load exceeds 80 percent of the theoretical elastic elongation of the unbonded length.

(3) If the total movement of the ground anchors at the maximum test load does not exceed 80 percent of the theoretical elastic elongation of the unbonded length, replace the ground anchor at no additional cost to the department.

(4) Ground anchors that have a creep rate greater than 0.08-inches/log cycle of time can be incorporated in the finished work at a load equal to one-half its failure load. The failure load is the load carried by the ground anchor after the load has been allowed to stabilize for ten minutes.

(5) When a ground anchor fails, modify the design and/or the construction procedures. These modifications may include, but are not limited to, installing replacement ground anchors, reducing the factored design load by increasing the number of ground anchors, modifying the installation methods, increasing the bond length or changing the ground anchor type. Any modifications of design or construction procedures including installing additional anchors shall be at the contractor’s expense and at no additional charge to the department.

(6) Upon completion of the test, reduce the load to the lock-off load indicated on the plans and transfer the load to the anchorage device. The ground anchor may be completely unloaded prior to lock off. After transferring the load and before removing the jack, record a lift-off reading. The lift-off reading must be within ten percent of the specified lock-off load. If the load is not within ten percent of the specified lock-off load, reset the anchorage and record another lift-off reading. Repeat this process until the desired lock-off load is obtained.

**D Measurement**

(1) The department will measure Tieback Anchors by each individual tieback anchor, acceptably completed, that are capable of carrying the load specified on the plans, which includes a proof test of each anchor.

(2) The department will measure Tieback Anchor Performance Tests by each individual performance test, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.20 | Tieback Anchors | EACH |
| SPV.0060.21 | Tieback Anchor Performance Tests | EACH |

Payment is full compensation for drilling; grouting; furnishing all steel, bearing plates and corrosion-protection materials required; tensioning; testing; and for designing and providing additional or remediation anchors for failed ground anchors.

1. Abandoning Sanitary Force Main Manholes, Item SPV.0060.71.

**A Description**

This special provision amendment describes abandonment of sanitary force main manholes which were constructed over bends in the force main. The frame and cover, chimney, and cone section shall be removed and the remaining structure shall be backfilled with granular material. The existing force main which runs through the force main manholes is to remain in service. Care shall be taken to not damage the main.

**B Materials**

Backfill shall consist of granular material conforming to standard spec 209.

**C Construction**

Manholes to be abandoned shall be completed according to 3.2.24 of the Standard Specifications for Sewer and Water Construction in Wisconsin, Latest Edition, except manholes shall be removed to a depth of 3-feet below the existing ground surface or to the bottom of the cone, whichever is deeper. Granular backfill shall be placed in such a manner as to not damage the force main which is to remain in service.

All castings on abandoned structures are the property of the City of Waukesha and shall be salvaged and delivered to the City of Waukesha Municipal Garage at 300 Sentry Drive. Contact Joe Deleon, (262) 524-3615, to make arrangements.

**D Measurement**

The department will measure Abandoning Sanitary Force Main Manholes as each individual item, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.71 | Abandoning Sanitary Force Main Manholes | EACH |

The work includes breaking down, removing, closing, plugging or sealing, for hauling and disposing of materials, for backfilling, bentonite, concrete block or concrete, for restoring the roadway, all other incidental work required under this section.

1. Internal Manhole Sealing System, Item SPV.0060.72.

**A Description**

This special provision describes furnishing and installing an internal sanitary manhole sealing system.

**B Materials**

Frame seals shall consist of a flexible internal rubber sleeve and stainless steel expansion bands as manufactured by Cretex Specialty Products and conforming to the following requirements:

* Rubber Sleeve - The flexible rubber sleeve shall be extruded or molded from a high grade rubber compound conforming to the applicable material requirements of ASTM C-923, with a minimum 1500 psi tensile strength, maximum 18% compression set and a hardness (durometer) of 48±5.

The rubber sleeve shall be double, triple or quadruple pleated with a minimum unexpanded vertical height of 8 inches and a minimum thickness of 3/16 inches. The top and bottom section of the sleeve that compresses against the manhole frame casting and the chimney/cone shall have an integrally formed expansion band recess and a series of sealing fins to facilitate a watertight seal. These sealing fins shall have teardrop holes or air pockets to allow the sealing area to conform to minor surface irregularities that may be encountered. Any splice used to fabricate the sleeve shall be hot vulcanized and have a strength such that the sleeve shall withstand a 180 degree bend with no visible separation.

* Expansion Bands - The expansion bands used to compress the sleeve against the manhole shall be integrally formed from 16 gauge stainless steel conforming to the applicable material requirements of ASTM A-240 Type 304, with no welded attachments and shall have a minimum width of 1-3/4 inches.

The bands shall have a minimum adjustment range of 2-1/2 diameter inches and the mechanism used to expand the band shall have the capacity to develop the pressures necessary to make a watertight seal. The band shall be permanently held in place with a positive locking mechanism which secures the band in its expanded position after tightening.

**C Construction**

The internal frame seals shall be installed according to the manufacturer’s instructions in order to seal the joint between the frame and the Expanded Polypropylene (EPP) rings.

**D Measurement**

The department will measure Internal Manhole Sealing System as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.72 | Internal Manhole Sealing System | EACH |

Payment is full compensation for furnishing all labor, equipment, material and sealant system accessories and supervision, and performing all work necessary to seal the manhole.

1. Pre-Paving Televising Sanitary Lateral, Item SPV.0060.73; Pre-Paving Televising Sanitary Main Line, Item SPV.0090.71.

**A Description**

This special provision amendment describes televising sanitary main line sewers and a lateral after all underground work is complete but before the final asphalt surface is placed. The underground work includes any activity that could potentially damage a sewer facility, which includes but is not limited to utility installation including third party utility work.

**B Materials**

The televising work shall be done by an independent television inspection service according to 7.1.2 in the Standard Specifications for Sewer and Water Construction in Wisconsin, 6th Edition and the National Association of Sewer Service Companies (NASSCO) Pipeline Assessment and Certification (PACP) and Lateral Assessment and Certification Program (LACP) standards. All inspection shall be collected using PipeTech Software by Peninsular Technologies. Inspections conducted with other software packages or converted to other formats will not be accepted.

The televising camera used for the inspection shall be one specifically designed and constructed for sanitary sewer inspection. The camera shall be a pan-and-tilt type capable of radial inspection of the top, bottom, and sides of the pipe including lateral connections. Lighting for the camera shall be suitable to allow a clear picture of the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions. The camera, television monitor, and other components of the video system shall be capable of producing picture quality to the satisfaction of the City of Waukesha. If the equipment proves to be unsatisfactory, it shall be replaced with adequate equipment.

Lateral cameras shall be color, shall be self-leveling, and equipped with a footage counter to provide on screen display of footage measurement.

**C Construction**

The main line sewer sections, defined as the length of pipe from center of manhole or structure to center of manhole or structure, shall be televised one section at a time.

For the televising of laterals, the main line sewer television camera shall be used to position the lateral camera launcher. At a minimum, the lateral sewer camera shall inspect laterals to the right-of-way limits, or in the case of a lateral replacement, to the upstream limit of the replacement plus an additional 5 feet upstream. Video recording shall continue during the entire camera withdrawal sequence. The television inspection of the lateral must be from inside the main line sewer up into the lateral and shall include a spot location with depth at the curb line and back of sidewalk. Inspections from cleanouts, excavations, or other access points will not be accepted.

The contractor shall fully televise both ends of the main line pipe so the connections at the manholes can be evaluated.

Wherever possible the inspections shall be performed in the upstream to downstream direction.

When sewer conditions prevent forward movement of the camera, the camera shall be withdrawn, and contractor shall televise the line from the opposite direction.

The camera shall be directed through the sewer at a uniform, slow rate. In no case will the video camera record while moving at a speed greater than 30 feet per minute. If the inspection is rejected due to camera speeds exceeding 30 feet per minute, the inspection recordings shall be redone at no additional cost to the City of Waukesha.

Flow levels within existing sewers to be inspected shall not exceed 5% of the pipe diameter. If water levels prevent adequate televising of the sewer, then conducting the work during low flow periods or other methods like plugging and bypass pumping shall be implemented.

The survey unit shall be slowed, stopped, or backed-up to perform detailed inspections of significant features. The camera shall be stopped at all defects, changes in material, water level, size, side connections, manholes, junctions, or other unusual areas. When stopped at the defect or feature, the operator shall pan the camera to the area and along the circumference of the pipe.

The operator shall also record audio of the type of defect or feature, clock position, footage, extent or other pertinent data.

Audio shall be recorded during each inspection by the operating technician, electronic voice text recognition or approved equal on the inspection video as the sewer is inspected and shall include the sewer location, identification of beginning and terminating manholes including location (address or cross streets), inspection direction, length of inspection, side sewer identification, flow information, complete descriptions of the sewer line conditions as they are encountered, description of the rehabilitation work, reason for termination, and other relevant commentary to the inspections. Voice descriptions should be made: 1) at points of pipe failure or weakness, 2) at points of infiltration, 3) at the location of service connections, 4) at points where unusual conditions are noted, and 5) at points where digital still photos are taken.

In addition, the audio reports shall include the distance traveled on the specific run, a description of abnormal conditions in the sewer and side sewer connections as they are encountered, explanations for pausing, backing up, or stopping the survey, and the final measured center to center distances between consecutive manholes. The audio portion of the composite video shall be sufficiently free from electrical interference and background noise to provide complete intelligibility of the oral report. Audio dubbing after the inspection is prohibited.

If the video and/or audio recording is of poor quality, the City of Waukesha has the right to require a re-submittal of the affected sewer sections and the inspection will not be deemed complete until an acceptable video and audio recording is made, submitted to, and accepted by the City of Waukesha.

Measurement for location of defects and actual length of pipe shall be by means of a calibrated meter on the camera with a digital readout on the video monitor. This readout shall be included in the video recording. Marking on cable, or the like, which would require interpolation for depth of manhole, will not be allowed. Measurement will be accurate to 1 foot per 100 feet of inspected pipe. Accuracy of the distance meter shall be checked by use of a walking meter, roll-a-tape, or other suitable device, and the accuracy shall be satisfactory to the City of Waukesha.

All inspections shall be performed by NASSCO PACP certified personnel. Use of PACP certified technicians to review/document defects in the office (post process) is not acceptable.

Any structural defects found along the main line sewer and laterals shall be immediately brought to the City of Waukesha’s attention for a determination of the necessary repair.

The inspection data shall be compatible with the city’s GIS and Asset Management Systems and shall be collected with PipeTech.

Television Inspection Logs: Electronic media location records shall be kept by the contractor and shall clearly show the location, by distance in 1/10 of a foot, from the center of the starting manhole or structure to each observation during inspection. Observations shall include, but not limited to, infiltration, service connections, unusual conditions, roots, cracks, fractures, broken pipe, presence of scale and corrosion, and other discernible features, as defined in the PACP defect codes, shall be recorded on electronic media and a copy of such records shall be supplied to the City of Waukesha.

Digital photographs of the pipe condition and all defects shall be taken by the contractor. Photographs shall be located by distance in 1/10 of a foot, from the center of the starting manhole or structure.

Electronic media recordings collected with including the digital video, images, and data files shall be created for each sewer section inspected. Files shall be submitted on DVD, flash drive, or portable hard drive. The purpose of electronic media recording shall be to supply a visual and audio record of the condition of the sewer lines that may be replayed by the City of Waukesha. Once recorded, the video shall become the property of the City of Waukesha.

The City of Waukesha will provide maps showing the structure and section numbers to be used.

The contractor will be notified in writing of any deficiencies revealed by the television inspection that will require repair, following which the contractor shall excavate and make the necessary repairs and schedule a television re-inspection of the repaired or corrected areas. Television re-inspection shall be at the contractor’s expense.

**D Measurement**

The department will measure Pre-Paving Televising Sanitary Lateral by each, acceptably completed. The department will measure Pre-Paving Televising Sanitary Main Line by the linear foot, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.73 | Pre-Paving Televising Sanitary Lateral | EACH |
| SPV.0090.71 | Pre-Paving Televising Sanitary Main Line | LF |

Payment is full compensation for the above described work.

1. Hydrant Relocation, Item SPV.0060.74.

**A Description**

This special provision describes the relocation of existing water hydrants.

**B Materials**

Furnished materials shall be according to Chapter 4 of the Waukesha Water Utility standard specifications. Hydrants leads shall be 6-inch ductile iron pipe (Class 52) including polyethylene wrap, bedding, cover, and compacted granular or slurry backfill. If a new tap is required, Waukesha Water Utility shall furnish the tapping sleeve, tapping valve and valve box and tap the water main; the contractor shall dig the trench, provide shoring, and provide the means for lowering the tapping machine.

**C Construction**

The contractor must relocate hydrants as shown on the plans, outside of the new proposed roadway limits. The front nozzle shall be a minimum of 2 feet behind the back of curb. The contractor is responsible for the necessary materials, backfill, compaction, and maintenance of trenches for this work.

Final location of hydrants and direction they face shall be coordinated directly with the Waukesha Water Utility.

All hydrants shall be installed to the proper bury depth; the contractor is responsible for providing all hydrant extensions, if required. Any damage to a hydrant or hydrant valve during construction shall be the responsibility of the contractor.

Existing valves and hydrants shall be operated only by Waukesha Water Utility personnel or in the presence of the inspector, as authorized by Waukesha Water Utility.

A Waukesha Water Utility representative will provide inspection for all water main installation and abandonment. Contractor shall provide a minimum of 72 hours (3 working days) of the anticipated need for inspection services. No work shall be undertaken without an inspector being on-site or without the permission of the Waukesha Water Utility. Payments may be denied or removal of work may be ordered for work accomplished without an inspector present or without the approval of the Waukesha Water Utility.

All testing requirements shall be met, according to the Waukesha Water Utility Standard Specifications and stated above in Water Main Relocation item C.2.

**D Measurement**

The department will measure Hydrant Relocation by each hydrant relocation, 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.0060.74 | Hydrant Relocation | EACH |

Payment is full compensation for excavation, shoring, furnishing all materials, backfilling and any other adjustment required during construction.

1. Water Main Valve Adjustments 6-Inch, Item SPV.0060.75; Water Main Valve Adjustments 8-Inch, Item SPV.0060.76; Water Main Valve Adjustments 12-Inch, Item SPV.0060.77; Water Main Valve Adjustments 16-Inch, Item SPV.0060.78; Water Main Valve Adjustments 20-Inch, Item SPV.0060.79.

**A Description**

This special provision describes the adjustment of water valve boxes.

**B Materials**

Waukesha Water utility will supply a screw in type riser for existing valve boxes which cannot be adjusted to grade. Insert-type risers that slide into the valve box will not be allowed.

**C Construction**

The contractor must adjust all water valves to final pavement grade. The contractor will be required to use slurry backfill around all water valves being adjusted when the excavation for the adjustment work is deeper than 1-foot. Slurry backfill will not be paid for separately but will be considered a part of the cost for the water main valve adjustment.

Any damage to a water valve box during construction shall be the responsibility of the contractor.

Water shutoff valves that will be located in proposed concrete must have the cover replaced with a cover type meant to be set in concrete.

The Waukesha Water Utility is requiring the use of a special screw-in type riser for the water valve boxes. If the existing valve box cannot be adjusted to grade, the Waukesha Water Utility will supply the screw-in riser. Insert-type risers that slide into the valve box will not be allowed.

**D Measurement**

The department will measure Water Main Valve Adjustment (size) by each, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.75 | Water Main Valve Adjustment 6-inch | EACH |
| SPV.0060.76 | Water Main Valve Adjustment 8-Inch | EACH |
| SPV.0060.77 | Water Main Valve Adjustment 12-inch | EACH |
| SPV.0060.78 | Water Main Valve Adjustment 16-Inch | EACH |
| SPV.0060.79 | Water Main Valve Adjustment 20-Inch | EACH |

Payment is full compensation for roughly setting the valve box, and final adjustment of the valve box to finished grade and any other adjustment required during construction.

There will be no payment for repairing a damaged water valve box. If a repair is requested or required by the Waukesha Water utility, the contractor will be billed separately for the repair expenses.

1. Lighting Control Cabinets, Item SPV.0060.80.

**A Description**

This special provision describes furnishing and installing lighting control cabinet, associated electrical equipment and concrete base as shown on the plans and hereinafter provided.

**B Materials**

**B.1 Contactor**

Provide an electrically held multi-pole contactor with coil capable of operating at the nominal voltage specified integral. Provide Square D, Type S series (open type) or equal by General Electric or Cutler-Hammer.

**B.2 Photocell**

Provide a button type photocell that is rated for 240V, 1800W with a 30 to 60 second delay between “on-off” operation.

**B.3 Circuit Breakers and Fuses**

The circuit breakers shall be capable of surface mounting with line and load lugs by Square D, F-Frame type or equal by Cutler-Hammer or General Electric. Provide appropriate AIC ratings.

Provide a 1 pole, 15 amp, control breaker for the control circuit.

All breakers shall be from the same manufacturer.

**B.4 Bus Bars**

Provide aluminum or copper ground and insulated neutral bus bars with wire range capabilities as indicated on the plans.

**B.5 Hand-Off-Auto Switch**

Provide a 3-position manual return selector switch in a NEMA 1 enclosure with legend plate as manufactured by Square D Type K, or equal by Cutler-Hammer or General Electric.

**B.6 Enclosure**

Provide a NEMA 4X enclosure made from .125" Type 5052-H32 aluminum. Provide a double flanged doorframe. Provide stainless steel for all exterior hardware. Provide a 3/4‑inch diameter stainless steel door handle with three point latching system and hasp. Provide a natural aluminum mounting panel at back (interior) of enclosure. Do not provide louvers. Cabinet secured by a contractor furnished weatherproof padlock. The enclosure shall have an aluminum mill finish. Provide an enclosure manufactured by APX Enclosures, Cleveland Manufacturing or Southern Manufacturing.

**B.7 Power Distribution Blocks**

Provide aluminum power distribution blocks with lug wire ranges on the main and branches as indicated on the plans with clear plastic covers as manufactured by Square D Type LB or equal by Cutler-Hammer or General Electric.

**B.8 Concrete Base**

Conform to standard spec 654.2.

**C Construction**

Use a UL Listed Panel Builder to assemble the lighting control cabinet. The control cabinet requires service entrance rating. Assemble the lighting control cabinet with all of its electrical components, wiring and parts in a neat and orderly fashion and as shown on the plans. Pretest the cabinet prior to shipment to the site.

Mount all equipment to panel in enclosure. Train the cables in straight horizontal and vertical directions and be parallel next to and adjacent to other cables whenever possible. Secure all wiring using screw attachment type straps; adhesive type will not be allowed.

Install photocell in the overhang of the control cabinet facing down and apply silicon caulk to maintain integrity of the enclosure.

Construct concrete base in conformance with standard spec 654.3.

Cabinet and components shall be designed as Service Equipment. No service disconnect exterior of the Lighting Control Cabinet shall be allowed.

Lighting Control Cabinet will be 480/240 volt single phase, 100 amps.

**D** **Measurement**

The department will measure Lighting Control Cabinets as each individual unit, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0060.80 | Lighting Control Cabinets | EACH |

Payment is full compensation for photocontrol, contactor, circuit breakers, fusing, distribution blocks, enclosure, bus bars, selector switch, grounding and electrical components, and for concrete base.

1. Luminaires Utility 21 Count LED 75 Watt Type III, Item SPV.0060.81.

**A Description**

This special provision describes furnishing and installing luminaires according to standard spec 651 through 660, as shown on the plans or as approved by the engineer, and as hereinafter provided.

**B Materials**

Cooper Lumark LDRC-T3-E03-E. Heavy-duty cast aluminum housing and removable door 3G vibration tested to ensure strength of construction and longevity in application. Die-cast aluminum door frame features integral hinges for tool-less maintenance access.

**C Construction**

Furnish and install LED luminaires together with hardware and fittings as the plans show. Install luminaires on luminaire arms with an initial rake of plus 3-degrees, this measurement includes the rake of the arm. Install luminaires on luminaire arms level in the longitudinal direction of the roadway except on segments where the profile is sloped greater than 3-degrees. In this case the engineer will determine the longitudinal level of the luminaires.

**D Measurement**

The department will measure Luminaires Utility 21 Count LED 75 Watt Type III 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.0060.81 | Luminaires Utility 21 Count LED 75 Watt Type III | EACH |

Payment is full compensation for the providing all materials including luminaires, ballasts, lamps, fittings, brackets, hardware and attachments; and for luminaire fusing if required.

1. Post Mounted Lighting Control Cabinet 120/240 VAC, Item SPV.0060.82.

**A Description**

This special provision describes furnishing and installing Post Mounted Lighting Control Cabinet for lighting as shown on the plans and hereinafter provided. The concrete foundation shall be paid separately.

**B Materials**

**B.1 Contactors**

The contactors shall be electrically held, specification grade, two-pole, with 30A contacts and 120V coil voltage. Provide 1-inch high engraved plaque above each contactor indicating the circuit number in 0.5-Inch text as appropriate.

**B.2 Photocell**

Provide photocell receptacle to accommodate NEMA twist-lock photocell. Provide opening on side of cabinet housing to allow proper photocell operation.

**B.3 HOA Switch**

Provide a hand-off-auto switch that is accessible without opening dead-front door. Provide 4 position selector switch Square D 9001KS88BH13, Patlite CWB4L-M2-CD, or approved equal with legend plate to read “HAND-OFF-PHOTOCELL-TIMER”.

**B.3 Panelboards**

Provide 100A load center with plug in breakers. Provide quantity (1) 2P-100A back-fed main breaker, quantity (4) 1P-15A control, light, GFCI and spare, and quantity (3) 2P-30A C1, C2 and surge arrester.

Breakers shall be accessible without opening dead-front door.

**B.4 Enclosures**

The cabinet shall be of NEMA Type 3R rainproof construction and shall be UL listed as “Enclosed Industrial Control Equipment” (UL 508A). External construction shall comply with UL50 requirements. Cabinet dimensions shall be as indicated on the attached drawings.

Cabinet exterior shall be fabricated from 1/8” clear anodized 5052-H32 aluminum.

All fasteners, latches, and hardware shall be of stainless steel and all hinges shall be continuous piano type, except that exterior door hinge may be powder-coated zinc lift-off type if approved by the department. No fasteners except sealing screws shall be removable by external access.

All edges and corners on both exterior and interior must be rounded and smooth to prevent injuries.

The distribution equipment compartment shall be behind an external lockable door with a three point latch and standard #2 key locking mechanism. A door keeper shall be provided to keep the door in the open position. This door keeper shall be able to hold the door 180 degrees open. Electrical equipment shall be located behind an internal dead-front door with a quarter turn securing latch and hinged to open a minimum of 120 degrees. The dead-front door shall be hinged on the same side as the external door.

A metal print pocket shall be located on the inside of the customer door large enough to hold all circuit directories and instructions in a clear plastic 8”x10” weatherproof sleeve.

The cabinet mounting bolts shall not be externally accessible. Cabinet shall be mounted to a cement pad with stainless steel anchors.

Cabinet shall be rated for operation at 22k minimum AIC amps interrupting. Series rating is acceptable.

All distribution and control equipment shall be factory wired using 600 volt wire sized to NEC and UL requirements.

The cabinet shall be according to the state standard detail drawing 9D-3-2. The cabinet size shall be 25-inch wide x 41” high and 16” total depth, style post mounted controller, EXL-PED240 as manufactured by EXCEL LTD, INC., CP3BO131EQW130 as manufactured by Milbank Company, or approved equal. Manufacturer shall ensure that cabinet will accommodate conduit placement as described on the concrete base plan.

**B.5 Field Wiring Termination Blocks**

All connections from the field wiring to equipment in the lighting control cabinet shall be made through termination blocks. Provide quantity of channel mount NEMA rated, box lug, single terminal blocks as indicated on plans that are capable of holding #12 to #2 wire for power, neutral, and grounding connections. The terminal blocks shall be mounted on a mounting channel with end anchors and an end barrier. Each terminal block shall have a label indicating the appropriate circuit number, neutral (‘N’), or ground (‘G’) wire connected to block; handwritten numbers and letters are not acceptable means of identification.

**B.6 Surge Protection Devices (SPD)**

**SPD for 120V or 120/240V Power:** Install a Type 1 SPD on distribution panelboard on the load side of a dedicated 2-pole, 30A circuit breaker. Leads shall be as short and straight as possible.

SPDs shall be UL listed and labeled to UL 1449 Third Edition. SPDs shall be posted on VZCA at UL.com.

The following ratings shall not be exceeded on any mode of protection:

1. Short Circuit Current Rating (SCCR): 200kA or the available short circuit current, whichever is greater.

* Nominal Discharge Current Rating (In): 20kA
* Voltage Protection Rating (VPR): 700V
* Maximum Continuous Operating Voltage (MCOV): 150V
* Peak surge current rating: 50kA per phase (sum of L-N plus L-G)

SPD’s SPDs shall include directly connected MOVs exceeding 32mm in diameter from L‑N and either L-G, N-G, or both. SPD shall at a minimum be rated as NEMA 1.

**B.7 Duplex Convenience Receptacle**

Provide a specification grade, 15A, GFCI receptacle flush-mounted on the dead front door accessible from the front.

Provide dedicated 15A, single-pole breaker to feed receptacle.

**B.8 Door-Activated light**

Provide LED light on cabinet ceiling to illuminate inside of cabinet. Install so that front of dead front door receives some light when it is closed. Provide Pentair model LEDA1S35, Siemens 30MM Selector, or approved equal.

Provide button-type light at top of exterior door opening switch that operates the light when outer door is opened/closed.

Provide dedicated 15A, single-pole breaker to feed light.

**B.9 Grounding**

Grounding Electrode Conductors: Grounding electrode conductors shall be solid, soft drawn 1/C No. 6 copper and shall be installed according to NEC requirements.

**Grounding Electrodes:** Grounding electrodes shall be copper-clad steel with a minimum copper thickness of 10 mils and UL listed 467. Grounding electrodes shall be one piece, sectional (threaded) steel rods not less than 5/8-Inch in diameter and 10ft long.

**Access Wells:** Grounding electrode access wells shall be constructed of PVC or composite polyester resin/fiberglass material with a diameter of 8 to 12-Inch, a length of 36-Inch and a cast iron or composite polyester resin/fiberglass lid, secured via stainless steel hardware.

**B.10 Control Equipment**

SPST, 20 amp switch for the door shall be single pole single throw type heavy duty, temper resistant, rated for 125V, UL listed.

Control breaker shall be 15 amp, single pole 120V, bolt on, UL listed. The circuit breaker shall have 10K AIR rating at 120V, terminal for minimum wire size 14 AWG and maximum wire size 8 AWG.

Timer switch shall be astronomical microprocessor-based with 2-channels. Timer switch shall be UL listed, 120V or 240V as shown on the plans. The timer switch shall be from manufacturer TORK model DZS200, ITERMATIC model ET2825CR, or approved equal.

**C Construction**

Use a UL 508 Listed Panel Builder to assemble the lighting control cabinet. Assemble the lighting control cabinet with all of its electrical components, wiring and parts in a neat and orderly fashion and as shown on the plans. Pretest the cabinet prior to shipment to the site. Panel Builder shall apply UL label inside cabinet.

Mount all equipment to panel in enclosure. Train the cables in straight horizontal and vertical directions and parallel next to and adjacent to other cables whenever possible. Install wiring in slotted wireway between terminal strip, contactor, and panelboard. Secure all remaining wiring using screw attachment type straps; adhesive type will not be allowed.

Surge arrester shall be installed to allow LED indicator(s) to be readily visible when viewing inside of cabinet. Connect the surge arresters as indicated on the plans.

Make all connections from the field wiring to equipment in the lighting control cabinet through termination blocks.

Make all connections from the underground field wiring to equipment in the lighting control cabinet through distribution blocks.

Install and connect the distribution center as shown in the plans. Make all connections for a complete and operable system.

Restore surfaces at locations where WE Energies has excavated for service extensions (to either side of its transformer) and rough backfilled.

The lighting cabinet shall be grounded such that the ground rod to earth resistance is not more than 10 ohms. If the measured resistance to ground exceeds 10 ohms, additional rods shall be added to the grounding electrode. A maximum number of three rods shall be coupled together. If coupling three rods together does not lower the resistance to 10 ohms, then additional grounding electrodes shall be installed, a minimum of 6 feet from each other and the initial installation and connected by a grounding electrode conductor to form a ground field. Ground rod access well shall be provided per NEC code.

Ground the chain link fence and electrically bond the gates to the fence with flexible jumpers whenever fences are crossed by an underground utility service lateral. For grounding use No. 4 AWG bare copper wire. A single ground rod shall be located directly under cable crossing. The ground wire shall be connected to the fabric and the ground rod by a mechanical clamp of a cast bronze body and bronze or stainless steel bolts and washers. The bottom connection of the ground wire shall be made to the tension cable.

Coordinate with the utility all necessary arrangements for installing and closing the utility service extension on behalf of the department. The department will pay all required utility service extension fees and will transfer ownership, maintenance, and services after construction and acceptance to the Department of Natural Resource (DNR), which will be the billing customer.

**D Measurement**

The department will measure Post Mounted Lighting Control Cabinet 120/240 VAC 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.0060.82 | Post Mounted Lighting Control Cabinet 120/240 VAC | EACH |

Payment is full compensation for hauling and installing the lighting control cabinet post mounted; for making connections; for providing and installing all parts, fittings, fasteners, connectors, and splice kits; for fence grounding; for restoration of WE Energies rough backfill; and for coordination with the utility.

1. Pond Edge Seed, Item SPV.0085.01.

**A Description**

This special provision describes furnishing and installing a Pond Edge Seed at the locations shown on the plans and as hereinafter provided.

**B.1 Materials**

Provide Pond Edge Seed of the following composition with species composed of Pure Live Seed (PLS) with no named or improved varieties unless specifically listed below:

Minimum three of the following species (70% by weight of seed blend):

Fescue, Cayenne, endophyte enhanced

Fescue, Crossfire II, endophyte enhanced

Fescue, Titan LTD, endophyte enhanced

Fescue, Blackwatch, endophyte enhanced

Fescue, Grade II, endophyte enhanced

Equal amounts of each of the five following species (10% total by weight of seed blend):

Purple Prairie Clover (*Dalea purpurea*)

Pale Purple Coneflower (*Echinacea pallida*)

Purple Coneflower (*Echinacea purpurea*)

Ox Eye Sunflower (*Heliopsis helianthoides*)

Black Eyed Susan (*Rudbeckia hirta*)

WisDOT Seed No. 40 according to standard spec 630 (20% by weight of seed blend). Do not include temporary seed mixtures or nurse crops to the No. 40 blend.

All PLS seed shall be from nurseries specializing in growing native species. All seed shall be cold, dry stratified. Minimum percent purity shall be 96 percent.

Contractor shall provide seed blend to engineer for final review and approval and shall include, from seed vendor, certification of seed showing mix composition and a guarantee of germination and the following information: Scientific name of genus and species (subspecies and variety as necessary) and guarantee that seeds are true to species, bulk weight of seed, PLS, supplier lot identification, calendar year in which seed was collected, seed origin (geographical location), seed supplier contact information including company name, address, phone number, contact person’s name and e-mail address.

**C Construction**

Seeding shall occur between April 15 to June 1 or between September 1 to October 15.

Remove any and all undesirable vegetation that has germinated in area to be seeded in a method that will not adversely affect the installation of new seed.

Scarify soils that have become compacted during construction operations. Ensure aerated subgrades to a minimum depth of 8 inches are present before proceeding with seeding operations.

Moisten prepared area before seeding if soil is dry. Water thoroughly and allow surface to dry before seeding. Do not create muddy soil.

No seeding shall occur on frozen ground or at temperatures lower than 32 degrees F.

Install Pond Edge Seed using Method A or Method B as outlined in spec 630 at a rate of 7 lbs/1000 sq. ft., or as recommended by seed supplier and approved by engineer.

**D Measurement**

The department will measure Pond Edge Seed by the pound, 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.0085.01 | Pond Edge Seed | LB |

Payment is full compensation for providing, handling, and storing all seed; for providing the required culture and inoculating seed as specified and as needed; and for preparing the seed bed, sowing, covering and firming the seed.

1. Seed Mixture, Short Grass Prairie, SPV.0085.02.

**A General**

This item describes preparing seed beds, furnishing and sowing specialty seed mixtures according to the applicable provisions of standard spec 630, as shown on the plans and as hereinafter provided.

**B Materials**

**B.1 General**

Provide all seed according to standard spec 630.2. Provide documentation of seed sources (supplier) and final proposed seed mixtures to the engineer a minimum of 30 calendar days prior to use for review. Obtain engineer’s approval of each of the suppliers and mixes, in writing, prior to installation on this project.

Ensure that the seed mix does not contain Birdsfoot Trefoil or Crown Vetch.

**B.2 Short Grass Prairie Mix**

Provide a seed mixture at areas shown as Short Grass Prairie in the plans, conforming to the following species and mixture proportions:

|  |  |  |  |
| --- | --- | --- | --- |
| Scientific  Name | Common  Name | % Mix  by Weight | PLS Grams/  1 Pound Mix |
| Grasses | | | |
|  | Side Oats Grama | 27.31 | 124 |
|  | Little Bluestem | 25.55 | 116 |
|  | Prairie Dropseed | 7.05 | 32 |
| Wildflowers | | | |
|  | Lavender Hyssop | 0.88 | 4 |
|  | Nodding Pink Onion | 2.64 | 12 |
|  | Sky Blue Aster | 0.88 | 4 |
|  | Smooth Aster | 0.88 | 4 |
|  | Lanceleaf Coreopsis | 1.76 | 8 |
|  | Shooting Star | 0.88 | 4 |
|  | Pale Purple Coneflower | 5.29 | 24 |
|  | Purple Coneflower | 3.52 | 16 |
|  | Rattlesnake Master | 2.64 | 12 |
|  | Prairie Blazingstar | 2.64 | 12 |
|  | Wild Quinine | 0.88 | 4 |
|  | Smooth Penstemon | 0.88 | 4 |
|  | Black-Eyed Susan | 1.76 | 8 |
|  | Brown-Eyed Susan | 0.88 | 4 |
|  | Stiff Goldenrod | 0.88 | 4 |
|  | Spiderwort | 1.76 | 8 |
|  | Golden Alexanders | 1.32 | 6 |
| Legumes | | | |
|  | Canada Milk Vetch | 0.88 | 4 |
|  | White Prairie Clover | 3.52 | 16 |
|  | Purple Prairie Clover | 4.41 | 204 |
|  | Roundhead Bushclover | 0.88 |  |

Do not include any additional cover crop or nurse crop as a part of the Short Grass Prairie mixes.

**C Construction**

Sow seeding mixtures according to standard spec 630.3.1(3) with a preference given to performing the Short Grass Prairie after October 15.

Doormant seeding after November 15 may be an option but would require additional coordination and instruction form the engineer. Dormant seeding must be approved, in writing, by the engineer.

Do not apply fertilizer to area to be seeded with Seeding Mixture, Short Grass Prairie.

Utilize Method C for Seeding Mixture, Shortgrass Prairie and perform seeding according to standard spec 630.3.3.3(3).

Seeding rate for Short Grass Prairie of 10 pounds per acre and apply at a rate not less than 150 seeds per square foot.

Guarantee the germination and vigorous growth of all Seeding Mixture, Short Grass Prairie. If germination and vigorous growth does not occur, contractor will be held responsible for making repairs, overseeding and/or re-seeding all areas that have not adequately germinated and demonstrated vigorous growth as directed by the engineer.

**D Measurement**

The department will measure Seed Mixture, Short Grass Prairie by the pound, 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.0085.02 | Seed Mixture, Short Grass Prairie | LB |

Payment is full compensation for providing, handling, and storing all seed; for providing the required culture and inoculating seed as specified and as needed; and for preparing the seed bed, sowing, covering and firming the seed.

1. Seeding Mixture Wetland, item SPV.0085.03.

**A General**

This special provision describes a wetland seeding mix to be used in restoring wetland areas which have temporary impacts from construction operations. Conform to standard spec 630 for native seed mixes 70 or 70A except as follows:

**B Materials**

Use a seed mix composed of the following with a sowing rate for seeds in pounds per 1000 square feet at 0.7 pounds:

|  |  |  |
| --- | --- | --- |
| Common Name | Botanical Name | Mixture % |
| **Forbs** |  |  |
| Marsh Milkweed | *Asclepias Incamata* | 5.0 |
| Common Milkweed | *Asclepias Syriaca* | 3.8 |
| New England Aster | *Aster Novae-angliae* | 1.3 |
| White Wild Indigo | *Baptisia Alba* | 3.8 |
| Spotted Joe Pye Weed | *Eupatorium Maculatum* | 1.3 |
| Boneset | *Eupatorium Perfoliatum* | 0.6 |
| Sneezeweed | *Helenium Autumnale* | 0.6 |
| Ox Eye Sunflower | *Heliopsis Helianthoides* | 1.9 |
| Prairie Blazingstar | *Liatris pycnostachya* | 3.8 |
| Marsh Blazingstar | *Liatris spicata* | 3.8 |
| Great Blue Lobelia | *Lobelia siphilitica* | 0.6 |
| Bergamot | *Monarda Fistulosa* | 0.6 |
| Yellow Coneflower | *Ratibida Pinnata* | 3.0 |
| Black Eyed Susan | *Rudbeckia Hirta* | 2.5 |
| Green Headed Coneflower | *Rudbeckia Laciniate* | 1.9 |
| Sweet Black Eyed Susan | *Rudbeckia Subtomentosa* | 1.3 |
| Prairie Dock | *Silphium Terebinthinaceum* | 5.0 |
| Stiff Goldenrod | *Solodago Rigida* | 0.6 |
| Blue Vervain | *Verbena Hastate* | 0.6 |
| Golden Alexanders | *Zizia Aurea* | 3.0 |
|  | *Forbes subtotal* | 45% |
| **Grasses** |  |  |
| Big Bluestem | *Andropogon Gerardi* | 2.5 |
| Fringed Brome | *Bromus Ciliatus* | 10.0 |
| Bebb’s Sedge | *Carex Bebbii* | 2.5 |
| Awl Fruited Sedge | *Carex Stipata* | 2.5 |
| Brown Fox Sedge | *Carex Wipinoidea* | 2.5 |
| Virginia Wild Rye | *Elymus Viginicus* | 27.5 |
| Fowl Manna Grass | *Glyceria Striata* | 1.9 |
| Dark Green Bulrush | *Scirpus Atroviens* | 2.5 |
| Woolgrass | *Scipus Cyperinus* | 1.9 |
| Prairie Cordgrass | *Spartina Pectinate* | 1.2 |
|  | *Grasses subtotal* | 55% |
| Total |  | 100% |

Alternate Species

|  |  |  |
| --- | --- | --- |
| Common Name | Botanical Name |  |
| **Forbs** | *Aster Puniceus* | [2] |
| Swamp Aster | *Gentiana Andrewsii* | [2] |
| Bottle Gentian | *Iris Shrevei* | [2] |
| Wild Iris | *Iris Shrevei* | [2] |
| Monkey Flower | *Mimulus Ringens* | [2] |
| Mountain Mint | *Pycnanthemum Virginianum* | [2] |
| Wild Senna | *Senna Hebecarpa* | [2] |
| Ohio Goldenrod | *Solidago Ohioensis* | [2] |
| Riddell’s Goldenrod | *Solidago Riddedlii* | [2] |
| Purple Meadow Rue Vernonia | *Thallictrum Dasycarpum* | [2] |
| Ironweed Veronicastrum | *Fasciculate* | [2] |
| Culver’s Root | *Vitginicum* | [2] |
|  | *Forbes* |  |
| **Grasses** |  |  |
| Canada Blue Joint Grass | *Calamagrostis Canadensis* | [3] |
| Fringed Sedge | *Crex Crinite* | [3] |
| Lance Fruited Sedge | *Carex Scoparia* | [3] |
|  | *Grasses* |  |

[2] The contractor may, if the engineer approves, substitute an alternate forb for a required forb that is not available using the same percentage as specified for the required forb. Use a different forb for each unavailable required forb. Provide documentation showing that a required forb is not available before using an alternate.

[3] The contractor may, if the engineer approves, substitute an alternate grass for a required grass that is not available using the same percentage as specified for the required grass. Use a different grass for each unavailable required grass. Provide documentation showing that a required grass is not available before using an alternate.

**C Construction**

*Add the following to standard spec 630.2.1.5.1.3:*

The seeding nurse crop bid item shall be placed at an application rate of 0.8 pounds per 1000 square feet for Seeding Mixture Wetland.

In addition to the weeds eradicated during the first growing season under standard spec 630.3.3.6.2, eradicate all Wisconsin NR40 prohibited and restricted invasive plant species and the following highly undesirable species that may pose a threat to the successful establishment of the planting: Reed Canary Grass (Phalaris arundinacea). Keep seeded areas free of unwanted species until the germinated seed reaches a minimum height of 4 inches.

*Replace standard spec 630.3.1(4) with the following:*

(4) Perform seeding at a rate of 0.7 pounds per 1000 square feet.

Once the seeding mixture is placed the contractor shall monitor the temporary restored areas with WisDOT and WDNR for final approval or corrective action. Monitoring of the restored areas shall be for six months or up to completion of the project whatever comes first. Final approval is when the native species have 50% vegetation.

**D Measurement**

The department will measure Seeding Mixture Wetland by the pound, 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.0085.03 | Seeding Mixture Wetland | LB |

Payment is full compensation for providing, handling, and storing all seed; for providing the required culture and inoculating seed as specified and as needed; and for preparing the seed bed, sowing, covering and firming the seed; and for furnishing and installing all materials, including but not limited to seed.

1. Heavy Duty Silt Fence, Item SPV.0090.01.

**A Description**

Furnish, install, and remove heavy duty silt fence as shown on the plans or as directed by the engineer before construction activities begin. Remove the silt fence only after construction activities have been completed. Remove trapped silt prior to removing the fence as directed by the engineer. Use in wetland areas with 6-12 inches of standing water.

**B Materials**

Furnish heavy duty silt fence consisting of a composite of woven wire fabric, posts, geotextile fabric, and fasteners to be assembled by the contractor. Woven wire fabric shall be a standard field fence type a minimum of 5 feet high with maximum mesh spacing of 6 inches and minimum 14 1/2-gage wire.

Posts shall be metal with a minimum length of 8 feet, 3 inches. Metal posts shall be “studded tee” or “U” type with a minimum weight of 1.3 pounds per foot.

The geotextile fabric shall be non-woven with properties as specified in standard spec 628.2.6.1.

**C Construction**

Install heavy duty silt fence as shown on the plans. Spacing of ties and anchors shall be adequate to resist current flow.

**D Measurement**

The department will measure Heavy Duty Silt Fence by the linear foot, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.01 | Heavy Duty Silt Fence | LF |

Payment is full compensation for furnishing, installing, and removing fence.

Heavy Duty Silt Fence maintenance will be paid for under the bid item Silt Fence Maintenance.

1. Fence Chain Link Polymer Coated 4-FT, Item SPV.0090.02; Fence Chain Link Polymer Coated 6-FT, Item SPV.0090.03.

**A Description**

This special provision describes furnishing and installing a new polymer-coated fence system on structures according to the pertinent plan details, as directed by the engineer and as hereinafter provided. The color of all components in this fence system shall be the same and shall be as specified on the plans.

**B Materials**

All materials for this fence system shall be new stock, free from defects impairing strength, durability, and appearance. Fabric shall be produced by methods recognized as good commercial practice. Wire used in the manufacture of the fabric shall be capable of being woven into fabric without the polymer-coating cracking or peeling. Pipes used in framework shall be straight, true to section and free of defects. All burrs at the ends of pipes shall be removed before galvanizing. The polymer-coating shall be a dense impervious covering, applied without voids, tears or cuts that reveal the substrate. Excessive roughness, bubbles, blisters and flaking in the polymer-coating will be a basis for rejection.

**B.1 Fabric**

Provide steel chain link fence fabric that conforms to the requirements of ASTM F668, Class 2b, a polymer-coating fused and adhered to wire that is zinc-coated. Provide fabric woven from 9-gage wire using plan specified mesh size, diamond pattern, with both the top and bottom selvages knuckled. The minimum breaking strength of the wire shall be 1290 lbs. The color of polymer-coating shall conform to the requirements of ASTM F934.

**B.2 Framework**

Provide steel rails, posts and post sleeves conforming to the requirements of ASTM F1083, Standard Weight Pipe (Schedule 40) of the size (O.D.) and weight as shown on the plans. The minimum yield strength shall be 30,000 psi and the minimum tensile strength shall be 48,000 psi. These components shall be zinc-coated inside and outside by the hot‑dip process as stated in ASTM F1083. Provide polymer-coating over zinc-coating that conforms to ASTM F1043. The color of polymer-coating shall conform to the requirements of ASTM F934, and match the color of the other fence components. Weld base plate to posts or post sleeves and complete any additional welding of components before galvanizing.

**B.3 Fittings**

Provide end post caps, line post caps, top rail sleeves, rail ends, line rail clamps, brace bands, tension bands, tension bars, and tie wires that are steel and conform to the requirements of ASTM F626. Tie wires shall be round and 9-gage wire. These components (excluding tie wires) shall be zinc-coated by the hot-dip process as stated in ASTM F626. Provide polymer-coating over zinc-coating on components (excluding tie wires) that conforms to the requirements of ASTM F626. For tie wires, provide polymer-coating on wire that is zinc-coated using the same procedure as used for the wires in the fence fabric. End post caps and line post caps shall fit tightly over posts to prevent moisture intrusion. Supply dome style caps for end posts and loop type caps for line posts. The color of polymer-coating shall conform to the requirements of ASTM F934, and match the color of the other fence components.

**B.4 Bolts**

All bolts are to be supplied with lock washers and nuts. Use galvanized steel bolts, nuts and washers per plan details.

**B.5 Tests**

**B5.1 Fabric and Tie Wire**

Breaking Strength: ASTM A370

Zinc-Coating Requirements

Weight of Zinc-Coating: ASTM A90

Polymer-Coating Requirements

Thickness of Polymer-Coating: ASTM F668

Adhesion: ASTM F668

Accelerated Aging Test: ASTM F668, D1499

Mandrel Bend Test: ASTM F668

**B.5.2 Framework**

Tensile and Yield Strength: ASTM E8

Zinc-Coating Requirements

Weight of Zinc-Coating: ASTM A90

Polymer-Coating Requirements

Thickness of Polymer-Coating: ASTM E376

Adhesion: ASTM F1043

Accelerated Aging Test: ASTM F1043, D1499

**B.5.3 Fittings**

Zinc-Coating Requirements

Weight of Zinc-Coating: ASTM A90

Polymer-Coating Requirements

Thickness of Polymer-Coating: ASTM F626

Adhesion: ASTM F1043 (same test as for framework)

Accelerated Aging Test: ASTM F1043, D1499 (same test as for framework)

**B.6 Submittals**

In addition to the engineer, send submittals listed in this section to the name below for informational purposes:

David Nelson

WisDOT (Bureau of Structures)

4822 Madison Yards Way (Room S416.25)

PO Box 7916

Madison, WI 53707

**B.6.1 Shop Drawings**

Submit shop drawings showing the details of fence construction. Show the fence height, post spacing, rail location, and all dimensions necessary for the construction of the chain link fence. Label the end posts, line posts, rails, post sleeves, top rail sleeves, bolts and fittings. State the polymer-coating type used on the fabric, framework and fittings and the Class of coating used on the fabric. State the color of polymer-coating to be used on the fence components. For the fabric, state the wire gage, mesh size, and type of selvages used. For the framework, state the size (O.D.) and unit weight for the posts and rails. For the fittings, state the size for top rail sleeves, brace bands, tension bands, tension bars, line rail clamps, size and type of bolts, and the tie wire gage. State the material type used for fabric, framework, and fittings. Also give the breaking strength for the fabric wire and the tensile and yield strength properties for the framework.

**B.6.2 Specification Compliance**

Submit certification of compliance with material specifications. Provide material certification and test documentation for fabric, framework, fittings and hardware that shows that all materials meet or exceed the specifications of this contract and the tests in B.5. This document shall provide the name, address and phone number of the manufacturer, and the name of a contact person.

**C Construction**

**C.1 Delivery, Storage and Handling**

Deliver material to the site in an undamaged condition. Upon receipt at the job site, all materials shall be thoroughly inspected to ensure that no damage occurred during shipping or handling and condition of materials is in conformance with these specifications. If polymer-coating is damaged, contractor shall repair or replace components as necessary to the approval of the engineer at no additional cost to the owner. Carefully store material off the ground to ensure proper ventilation and drainage and to provide protection against damage caused by ground moisture. Handle all polymer-coated material with care.

**C.2 Touch-up and Repair**

For minor damage caused by shipping, handling or installation to polymer-coated surfaces, touch-up the finish in conformance with the manufacturer’s recommendations. Provide touch-up coating such that repairs are not visible from a distance of 6-feet. If damage is beyond repair, the fencing component shall be replaced at no additional cost to the Owner. The contractor shall provide the engineer with a copy of the manufacturer’s recommended repair procedure and materials before repairing damaged coatings.

**C.3 General**

Install the chain link fence according to ASTM F567 and the manufacturer’s instructions. The contractor shall provide staff that is thoroughly familiar with the type of construction involved and materials and techniques specified. Chain link fabric shall be installed on the side of the posts indicated on the plans. Fabric shall be attached to the end posts with tension bars and tension bands. It shall be attached to rails, and posts without tension bands, with tie wires. The fabric shall be installed and pulled taut to provide a smooth and uniform appearance free from sag, without permanently distorting the fabric diamond or reducing the fabric height. Install top rail to pass through line post caps and form a continuous brace between end posts. Minimum length of top rail between splices shall be 20-feet. Splice top rail at joints with sleeves for a rigid connection. Locate splices near 1/4 point of post spacing. Heads of bolts shall be on the side of the fence adjacent to pedestrian traffic.

**D Measurement**

The department will measure Fence Chain Link Polymer Coated 4-FT and 6-FT by the linear foot, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.02 | Chain Link Fence Polymer Coated 4-FT | LF |
| SPV.0090.03 | Chain Link Fence Polymer Coated 6-FT | LF |

Payment is full compensation for fabricating, galvanizing and polymer-coating all fence components, and transporting to jobsite; for erecting components to create a polymer-coated fence system, including any touch-up and repairs.

1. Construction Staking Sidewalk, Item SPV.0090.04.

**A Description**

Work under this item consists of contractor-performed construction staking required to establish the horizontal and vertical position for the sidewalk and to establish the required positions of the pedestrian ramps. Perform all work under this item according to standard spec 105.6 and 650. Construction Staking Sidewalk includes staking of the pedestrian ramps.

**B (Vacant)**

**C Construction**

Use methods that conform and are according to the pertinent requirements of standard spec 650.3. Place construction stakes for sidewalk at intervals of 25 feet. A minimum of two stakes per cross section is required. Set and maintain as necessary additional stakes per cross section to achieve the required accuracy and to satisfy the method of operations. Set additional construction stakes as necessary to establish location and grade of sidewalk, including points of change in alignment grade, along intersecting walks, at pertinent points of the pedestrian ramps, and at the radius points of intersecting walks. Locate all sidewalk construction stakes to within 0.02 foot of the true horizontal position and establish the grade elevation to within 0.01 foot of the true vertical position.

**D Measurement**

The department will measure Construction Staking Sidewalk by the linear foot, acceptably completed, measured along each sidewalk centerline. The staking of the pedestrian ramps is incidental to the item Construction Staking Sidewalk and will not be measured. The department will not measure construction staking for base underlying sidewalk. The department will not measure construction staking for sidewalk that is parallel to the adjacent roadway.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.04 | Construction Staking Sidewalk | LF |

Payment is full compensation for locating and setting all construction stakes and for relocating and resetting damaged or missing construction stakes. Standard spec 650.5(2) shall apply for final payment. The staking of the pedestrian ramps is incidental to the item Construction Staking Sidewalk.

1. Construction Staking Fence Safety, Item SPV.0090.05.

**A Description**

Work under this item consists of contractor-performed construction staking of safety fence to protect fen and interior forest areas, contractor required to establish the horizontal and vertical position for the safety fence to be installed around the fen and forest areas. Perform all work under this item according to standard spec 105.6 and 650.

**B (Vacant)**

**C Construction**

Use methods that conform and are according to the pertinent requirements of standard spec 650.3. Place construction stakes for sidewalk at intervals of 25 feet. A minimum of two stakes per cross section is required. Set and maintain as necessary additional stakes per cross section to achieve the required accuracy and to satisfy the method of operations. Set additional construction stakes as necessary to establish location and grade of sidewalk, including points of change in alignment grade, along intersecting walks, at pertinent points of the pedestrian ramps, and at the radius points of intersecting walks. Locate all sidewalk construction stakes to within 0.02 foot of the true horizontal position and establish the grade elevation to within 0.01 foot of the true vertical position.

**D Measurement**

The department will measure Construction Staking Fence Safety by the linear foot, acceptably completed, measured along the fence centerline.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.05 | Construction Staking Fence Safety | LF |

Payment is full compensation for locating and setting all construction stakes and for relocating and resetting damaged or missing construction stakes. Standard spec 650.5.(2) shall apply for final payment.

1. Type UF Cable, 2 Conductor, No. 14, Item SPV.0090.41.

**A Description**

This special provision describes furnishing and installing cable for confirmation lights and making all connections conforming to standard spec 655, as shown on the plans and as hereinafter provided.

**B Materials**

When EVP confirmation lighting is installed in conjunction with traffic signals, conductors from the traffic signal control cabinet to the confirmation light(s) shall be Type UF, two conductor without ground, solid copper conductor cable, size No. 14.

**C (Vacant)**

**D Measurement**

The department will measure Type UF Cable, 2 Conductor, No. 14, by the linear foot of cable, 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.0090.41 | Type UF Cable, 2 Conductor, No. 14 | LF |

Payment is full compensation for furnishing and installing cable; for making all connections; for furnishing and installing all connectors, including wire nuts, splice kits, tape, insulating varnish or sealant and ground lug fasteners, for testing; and incidentals necessary to complete the contract work.

1. Water Main Relocation 8-Inch, Item SPV.0090.72; Water Main Relocation 12‑Inch, Item SPV.0090.73; Water Main Relocation16-Inch, Item SPV.0090.74; Water Main Relocation 20‑Inch, Item SPV.0090.75.

**A Description**

This special provision describes relocating existing Waukesha Water Utility water main which is in conflict with proposed storm sewer, end walls, rip rap, or other proposed project work. The work shall be according to the Water Main Details and at the locations shown on the Storm Sewer Layout Plans.

**A.1 Specifications**

All construction and installation shall be according to the *Specifications for Water main & Service Lateral Materials and the Installation of Water Main & Appurtenances for Waukesha Water Utility of the City of Waukesha dated August 29, 2014*, the regulations of the Department of Natural Resources (WDNR), the *Standard Specifications for Sewer and Water Construction in Wisconsin – Sixth Edition*, AWWA Specifications, manufacturers’ recommendations and these provisions.

**A.2 Site Conditions**

Contractor shall view the site prior to bidding to become familiar with the existing conditions. It will be the responsibility of the contractor to work with the utilities located within the right-of-way to resolve conflicts during construction. The location of structures and obstacles shall not be taken as conclusive. Verification to the satisfaction of the contractor shall be assumed as a condition of bidding and therefore the contractor shall be solely responsible for all damages resulting from the contractor’s activities.

**A.3 Insurance**

Contractor shall submit a Certificate of Insurance, as required by the Waukesha Water Utility, indicating that the insurance meets the Waukesha Water Utility’s requirements and limits and is in effect for the duration of the project.

**A.4 Pre-Construction Meeting**

Prior to commencing any water main work, a pre-construction meeting will be conducted. The contractor will not receive approval to undertake any work without a pre-construction meeting or approval of the Waukesha Water Utility.

**A.5 Service Provided By Waukesha Water Utility**

**A.5.1 Staking**

Staking will be provided by the Waukesha Water Utility on a one-time basis at no cost to the contractor. After stakes are set, it shall be the contractor’s responsibility to protect all survey marks, stakes, nails, etc. Re-staking any portion of the work shall be done at the contractor’s expense. The contractor shall provide 72 hours (3 working days) notice of and staking needs.

**A.6.2 Inspection**

A Waukesha Water Utility representative will provide inspection for all water main installation and abandonment. Contractor shall provide a minimum of 72 hours (3 working days) of the anticipated need for inspection services. No work shall be undertaken without an inspector being on-site or without the permission of the Waukesha Water Utility. Payments may be denied or removal of work may be ordered for work accomplished without an inspector present or without the approval of the Waukesha Water Utility.

Contractor shall be responsible for damage to adjoining buildings and grounds caused during construction. The location of structures and obstacles shall not be taken as conclusive. Verification to the satisfaction of the contractor shall be assumed as a condition of bidding and therefore the contractor shall be solely responsible for all damages resulting from the contractor’s activities. Claims for extra cost or time must be submitted in writing to the Waukesha Water Utility prior to proceeding with any work.

**A.7 Notification**

Contractor shall notify all utilities having facilities in the project area, the police and the fire departments when construction will commence. Notice shall be given 72 hours prior to the start of construction.

**B Materials**

Furnish materials according to Chapter 4 of the Waukesha Water Utility standard specifications.

Ductile Iron Pipe, Special Thickness Class 52, according to AWWA C151 with cement mortar lining complying with ANSI A-21.4 or AWWA C104 and with asphaltic outside coating 1 mil thick. Factory-manufactured ductile iron / cast iron long pattern sleeves shall be used at the connections to the existing cast iron water main. Joints shall be compact style according to AWWA C153 with cement mortar lining complying with AWWA C104 and with asphaltic outside coating 1 mil thick. All joints shall be restrained.

Contractor shall submit to the Inspector and Owner, for approval, a list of all materials intended to be used prior to ordering and delivery to the job site, including the names of all material suppliers.

Continuous tracer wire shall be installed with all water pipe, including PVC and Ductile Iron water mains. Tracer wire shall be installed in such a manner as to be able to trace all water mains without loss or deterioration of signal. Tracer wire system must pass a conductivity test before final acceptance of the water main installation is accepted by the Waukesha Water Utility. All tracer wire ends must be grounded. At the point of connection between either cast or ductile iron water mains, with any new water main, the tracer wire shall be properly connected to the iron pipe with either a cad weld or a conductivity clamp. Tracer wire shall be placed along the entire length of pipe and fitting sand taped at a minimum of every 10 feet to the top of the pipe. Tracer wire shall be kept taut during backfill so the wire does not slide down along the side of the water main. Tracer wire shall be protected from damage during water main installation. No breaks or cuts in the tracer wire or wire insulation will be permitted. All tracer wire splices shall have the wire end looped a minimum of four times, the joint must be soldered and the connection shall be covered with a waterproof wrap that is approved for underground wire splices.

Tracer wire shall be a minimum of 12 gauge solid core copper electric wire with blue PVC coating and rated for wet conditions, or #12 AW HS-CCS high-strength copper clad steel conductor (HS-CCS), insulated with a 30 mil, high density, high molecular weight polyethylene (HDPE) insulation, and rated for direct burial use at 30 volts. HS-CCS conductor must be 21% conductivity for locating purposes, with minimum break load of 380 pounds. Standard tracer wire is unacceptable.

Whenever Ductile Iron pipe is installed, the contractor shall encase pipe in 8 mil polyethylene. The polyethylene shall be furnished in either tube or sheet form. Installation shall be by a method described according to ANSI/AWWA C105/A21.5 - Latest Revision. All joints shall be lapped and taped sufficiently to prevent the soil from coming in contact with the pipe. Contractor shall take care in placing the polyethylene and in backfilling to prevent tearing and puncturing the wrapping and shall conform to the requirements of Chapter 4.4.4 of the Standard Specifications for Sewer and Water Construction in Wisconsin.

Where the existing or new offset water main is within 24 inches of the storm sewer, or where rip rap is placed over existing water main, a minimum of 2-inches of closed cell rigid polystyrene insulation board intended for underground installation shall be placed between the two pipes. The cost for insulation shall be shall be included in the linear foot of pipe being constructed unless called out separately on the plans. Contractor shall provide insulation as noted and offset water main at the size and location noted on the Water Main Details and Storm Sewer Layout plans.

All cast-iron fittings and valves shall be completely wrapped with 8 mil polyethylene wrap to protect them from corrosion. If the fitting or valve cannot be wrapped practically in a tube, a double wrap of flat sheet or split tube shall be used. The wrap shall extend approximately 18 inches beyond all joints. All seams shall be taped securely.

Storage of materials for construction will be permitted on the job site with prior approval. Care shall be taken to avoid blocking driveways or interfering with traffic. Materials stored within the street right-of-way shall be barricaded and lighted with emergency flashers.

Bedding material is required 4-Inches under and 12-Inches over the pipe as a minimum. Sand is required around all copper water laterals and brass fittings. The cost for bedding, cover and mechanically compacted granular backfill shall be included in the linear foot of pipe being constructed.

The contractor is responsible for hauling and removal of all surplus excavated material.

**C Construction**

Install gate valves and valve boxes according to Chapter 6 of the Waukesha Water Utility standard specifications.

Contractor shall be solely responsible for providing trench support according to all applicable State and Federal regulations. The Waukesha Water Utility and Inspector shall be held harmless in all matters regarding shoring and bracing. Side sloping of trenches will not be allowed where damage to sidewalk, curb, structures and underground utilities would be caused by such side sloping.

**C.1 Mechanical Compaction**

Excavated material or granular backfill shall be mechanically compacted with an initial lift of 2 feet and subsequent lifts of 1 foot, according to Section 2.6.14 (b) of the Standard Specifications for Sewer & Water Construction in Wisconsin – Sixth Edition. Any deficiency in quantity of backfill material (caused by shrinkage or settlement) shall be supplied at no additional cost to the Owner. The cost of mechanically compacted backfill shall be included in the cost of linear foot of pipe being installed.

The Waukesha Water Utility has contracted with a soil testing firm to perform compaction testing on the trenches for all projects. The contractor for this project will be required to meet a minimum compaction of 90% Standard Proctor Density in the bottom 3 feet and a minimum compaction of 95% Standard Proctor Density in the top three feet of the excavated material or granular backfill. Testing will be done at no cost to the contractor.

**C.2 Testing**

All water mains shall be tested in full accordance with the requirements of Chapter 4.15.0 and Section 5.5.18 of the Standard Specifications for Sewer and Water Construction in Wisconsin.

All water mains (connections, pipe, and fittings) shall be disinfected by swabbing with a strong chlorinated solution. At the completion of construction, the relocated water main segment shall be flushed by opening a nearby hydrant. Contractor shall provide a clean fire hose or other approved device to directly convey the flushed water into the storm sewer. The fire hydrant and storm sewer structure shall be selected to comply with approved traffic control plans. These flushing methods must use the appropriate number of hoses or other DIRECT conveyance devices to reach the minimum water flow rate of 2 1/2 feet per second of water flow in the main as required for proper flushing. These hoses or devices must be supplied, installed and removed by the contractor.

The water must be discharged in such a manner as to not promote erosion of the area or movement of site materials off site or into the storm sewer system. This may require discharge directly into an established storm sewer inlet, or conveyance to a clean and paved surface to utilize the existing curbs and storm sewer system. Flow of water from flushing or testing directly across disturbed surfaces will not be allowed. Flow of water within an existing curb and gutter line will only be allowed if the area is completely free of gravel and debris and if the flow fully remains on the undisturbed surface. It may be necessary to remove the inlet protection used during construction for the periods when flushing is occurring; these protections must be properly replaced when flushing has ended. Depending on the situation, it may also be necessary to stub up a temporary storm sewer inlet at flushing points if the distance to an established storm sewer system is too great.

**C.3 Coordination**

Contractor shall coordinate the following with Waukesha Water Utility:

Existing valves and hydrants shall be operated only by Waukesha Water Utility personnel or in the presence of the inspector, as authorized by Waukesha Water Utility.

Contractor shall coordinate with Waukesha Water Utility all work associated with connecting the offset water main to the old water main. The Waukesha Water Utility will assist in turning the existing valves to isolate these areas for the installation of the water main offsets. The water mains will not be allowed to be shut down before 8:00 AM. Contractor shall be responsible for notifying all customers when their water will be shut off. Notification should be done at least 24 hours prior to shut down whenever possible. No extra costs or change orders will be allowed for down time associated with the Waukesha Water Utility crews turning the water off or on.

A schedule showing tentative dates for water main construction shall be provided to the Water Utility at least 2 weeks prior to construction. Contractor shall provide 72 hours (3 work days) notice of the anticipated need for inspection services. No work shall be undertaken without an inspector being on site without the permission of the Waukesha Water Utility. Payments may be denied, or removal of work may be ordered, for work accomplished without an inspector present or without the approval of the Owner.

Waukesha Water Utility will provide inspection services for this work and shall be notified a minimum of three days prior to the work being performed.

**Adjustment of valve boxes or curb stops**. Contractor shall identify proposed grade changes that affect valve boxes or curb stops and notify Waukesha Water Utility providing at least 24 hours’ notice.

**D Measurement**

The department will measure Water Main Relocation (x-Inch) by the linear foot, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.72 | Water Main Relocation 8-Inch | LF |
| SPV.0090.73 | Water Main Relocation 12-Inch | LF |
| SPV.0090.74 | Water Main Relocation 16-Inch | LF |
| SPV.0090.75 | Water Main Relocation 20-Inch | LF |

Payment is full compensation for all furnishing, assembling, erecting, maintaining, and removing the water main; for necessary materials, excavation, backfill, compaction and maintenance of trenches; and for hauling and disposal.

1. Conduit Flexible Metallic 2-Inch, Item SPV.0090.76.

**A Description**

This special provision describes furnishing and installing flexible metallic conduit between the concrete base / barrier wall and temporary junction box.

**B Materials**

Furnish flexible metallic conduit and adapters of the appropriate size to transition from PVC conduit installed in the adjacent structures.

The flexible metallic conduit shall be liquid tight with moisture, oil, and sunlight resistant polyvinyl chloride (PVC) jacket applied directly over the flexible metal conduit with wall thickness according to UL 360.

The flexible metallic conduit shall be UL listed for between -67º F and +221 º F.

According to UL 360, the flexible metallic conduit shall meet all of the following performance tests:

* Resistance and High Current
* Fault Current
* Impact
* Tension
* Crushing
* Pipe Stiffness
* Flexibility
* Low Temperature Flexibility
* Zinc Coating
* Vertical Flame
* Physical Properties
* Deformation
* Mechanical Water Absorption
* Moisture Penetration
* Sunlight Resistance
* Test for Secureness of Fittings

The fittings and adapters shall be of the same manufacturer as the conduit.

**C Construction**

Install the fittings, adapters, and conduit between PVC conduits installed in adjacent concrete bases / barrier wall per the manufacturer’s instructions and as shown on the plans.

**D Measurement**

The department will measure Conduit Flexible Metallic 2-Inch by the linear foot of conduit installed, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.76 | Conduit Flexible Metallic 2-Inch | LF |

Payment is full compensation for furnishing and installing the conduit, including the connectors.

1. 3/4 – Inch Liquid Tight Conduit, Item SPV.0090.77.

**A Description**

This special provision describes furnishing and installing liquid tight flexible metallic conduit between wire ways utilized for tunnel lighting and the tunnel luminaires.

**B Materials**

The flexible metallic conduit shall be liquid tight with a moisture, oil, and sunlight resistant polyvinyl chloride (PVC) jacket applied directly over the flexible metal conduit with wall thickness according to UL 360.

The flexible metallic conduit shall be UL listed for between -67º F and +221 ºF According to UL 360, the flexible metallic conduit shall meet all of the following performance tests:

* Resistance and High Current
* Fault Current
* Impact
* Tension
* Crushing
* Pipe Stiffness
* Flexibility
* Low Temperature Flexibility
* Zinc Coating
* Vertical Flame
* Physical Properties
* Deformation
* Mechanical Water Absorption
* Moisture Penetration
* Sunlight Resistance
* Test for Secureness of Fittings

The fittings and adapters shall be of the same manufacturer as the conduit.

**C Construction**

Install the fittings, adapters, and conduit between the wire ways used in conjunction with tunnel lighting and the tunnel lighting. Install per the manufacturer’s instructions and as shown on the plans.

**D Measurement**

The department will measure 3/4-Inch Liquid Tight Conduit by the linear foot of conduit installed, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.77 | 3/4 – Inch Liquid Tight Conduit | LF |

Payment is full compensation for furnishing and installing the conduit, including the connectors.

1. Conduit Reinforced Thermosetting Resin 1-Inch, Item SPV.0090.78.

**A Description**

This special provision describes providing and installing conduit reinforced thermosetting resin 1-inch according to standard spec 652 and as shown on the plans.

**B Materials**

All conduit supports shall be of the double roller type as shown in the plans. Roller material shall be suitable for use with reinforced thermosetting resin conduit (RTRC).

Conduit supports shall be galvanized or stainless steel.

**C Construction**

The contractor is advised that all of this type of conduit is installed onto the underdeck of the freeway.

All nuts on supports shall be double nutted.

**D Measurement**

The department will measure Conduit Reinforced Thermosetting Resin 1-Inch by the linear foot, acceptably completed, and measured along the conduit centerline from the centerline of fittings or, where there are no fittings, from the free ends of the conduit.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0090.78 | Conduit Reinforced Thermosetting Resin 1-Inch | LF |

Payment is full compensation for providing the conduit, conduit bodies, and fittings; for providing all conduit hangers, clips, attachments, and fittings used to support conduit on structures; for pull wires or ropes; for expansion fittings and caps; for disposing of surplus materials; and for making inspection.

1. Removing Overhead Sign Support S-67-220, Item SPV.0105.02.

**A Description**

Work under this item shall consist of removing the overhead sign structure and footing. The sign on the structure is paid for under a separate pay item, i.e., Removing signs type II. See signing plans for location.

**B (Vacant)**

**C Construction**

Remove overhead sign supports and concrete footings, backfill the resulting holes, and dispose of all materials outside of the right-of-way according to standard spec 204.3 and 638.3. Concrete footing shall be removed to 2 feet below the existing ground. The reinforcement shall be cut off flush with the top of the concrete. The footing shall be then covered with topsoil and seeded. This is all incidental to Remove Overhead Sign Structure.

**D Measurement**

The department will measure Removing Overhead Sign Support S-67-220 as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.02 | Removing Overhead Sign Support S-67-220 | LS |

Payment in full compensation for disassembling, removing, including concrete footings, and disposal of all materials.

638-SER1 (20040405)

1. Temporary Bypass Channel Structure C-67-91, Item SPV.0105.03.

**A Description**

This special provision describes constructing temporary bypass channel for the drainage way through Structure C-67-91 according to the standard specifications, the plans, and hereinafter provided. The contractor may propose other alternatives for a temporary bypass channel as long as the proposed alternative meets DNR approval in the ECIP. Any materials used for alternative proposals will be considered incidental to this item.

**B Materials**

Construct temporary bypass channel according to the details provided in the plan. Provide polyethylene sheeting according to standard spec 628.2 and provide select crushed material according to standard spec 312.

**C Construction**

Construct temporary bypass channel according to standard spec 205.3 and 628.3. Maintain channel flow at all times and minimize erosion into the existing stream using appropriate erosion control measures.

**D Measurement**

The department will measure Temporary Bypass Channel C-67-91 as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.03 | Temporary Bypass Channel Structure C-67-91 | LS |

Payment is full compensation for furnishing materials, any excavation required, hauling, placing all materials, including sand bags, polyethylene sheeting, anchors, and select crushed material, and for channel change removal.

(NER11-0128)

1. Bioretention Pond Items, Item SPV.0105.04.

**A Description**

This special provision describes the majority of work necessary to furnish and install bioretention facility, including the engineered soil media, pea gravel, gravel, sand, and clean-out ports. Additional work covered elsewhere includes but not limited to standard spec 612, 628, 630, and 645.

**B Materials**

All bioretention items shall meet the requirements of the following specifications. The engineer and department reserves the right to take samples of materials whenever deemed necessary. The landscape contractor who is responsible for furnishing and installing engineering soil shall also be solely responsible for obtaining mix components, blending the mix to the specified proportions, and for furnishing and installing the planting mix.

**B.1 Engineering Soil**

The engineering soil consists of the following specifications:

* The engineered soil media mixture shall consist of a mixture of 70% sand and 30% compost. The percentages are based on volume. Special attention should be given to plant selection when the percentage of sand exceeds 75%.
* The sand component of the engineered soil media shall meet one of the following gradation requirements:

1. USDA Coarse Sand (.02 - .04 inches).

2. ASTM C33 (Fine Aggregate Concrete Sand).

3. Spec 501.2.5.3.4. (Fine Aggregate Concrete Sand) latest edition, or an equivalent as approved by the engineert. The sand shall meet the following gradation requirements:

|  |  |
| --- | --- |
| Sieve Size | Percent Passing by Weight |
| 3/8-inch | 100 |
| No. 4 | 90 to 100 |
| No. 16 | 45 to 85 |
| No. 50 | 5 to 30 |
| No. 100 | 0 to 10 |

The preferred sand component consists of mostly Si02, but sand consisting of dolomite or calcium carbonate may also be used. Manufactured sand or stone dust is not allowed. The sand shall be washed and drained to remove clay and silt particles prior to mixing.

The compost component of the engineered soil media shall meet the requirements of Wisconsin Department of Natural Resources Specification S100, Compost, as follows:

* Particle Size – 98% of the compost shall pass through a 0.75-inch screen.
* Physical Contaminants – Less than 1% combined glass, metal and plastic.
* Organic Matter/Ash Content – At least 40% organic matter; less than 60% ash content.
* Carbon to Nitrogen Ratio – 10-20:1 C:N ratio.
* pH – Between 6 and 8.
* Soluble Salt – Electrical conductivity below 10 dS m-1 (mmhos cm-1)
* Moisture Content – Between 35% and 50% by weight.
* Maturity – The compost shall be resistant to further decomposition and free of compounds, such as ammonia and organic acids, in concentrations toxic to plant growth.
* Residual Seeds and Pathogens – Pathogens and noxious seeds shall be minimized.
* Pathogens – The compost shall meet the Class A requirements for pathogens as specified in s. NR 204.07(6)(a), Wis. Adm. Code.
* Other Chemical Contaminants – The compost shall meet the high quality pollutant concentrations as specified in s. NR 204.07(5)(c), Wis. Adm. Code.

The engineered soil media mixture shall be free of rocks, stumps, roots, brush or other material over 1 inch in diameter. No other materials shall be mixed with the planting soil that may be harmful to plant growth or prove a hindrance to planting or maintenance.

* Engineered soil media mixture shall have a pH between 5.5 and 8.0.
* Engineered soil media mixture shall have adequate nutrient content to meet plant growth requirements.
* Saturated hydraulic conductivity of the engineered soil media mixture shall be 6 to 10 inches per hour tested according to ASTM F1815. The total porosity shall be 35% to 55% and the moisture holding capacity shall be 15% to 25%. Conduct infiltration test to ensure soil mix meets the saturated hydraulic conductivity criteria.

Contractor shall submit engineered soil analysis by a qualified soil-testing laboratory showing conformance with engineered soil media mixture specifications. Submit soil analysis to the engineer or department for review and approval prior to installation.

Contractor shall conduct and submit results of an on-site infiltration test of the engineered soil media to ensure conformance with saturated hydraulic conductivity criteria. Using 5 cubic yards of the prepared engineered soil media, contractor shall place the material on site at the proper location and depth, allow for proper settlement of the engineered soil media, and conduct an infiltration test using a double-ring infiltrometer according to ASTM D3385. Submit infiltration test results to department for review and approval prior to installation of the remaining engineered soil media.

**B.2 Gravel**

The gravel storage layer below the engineered soil media is intended for temporary storage of stormwater runoff. The storage layer shall consist of gravel that shall conform to the following specifications:

* The gravel shall be a well-graded coarse aggregate that meets the coarse aggregate standard spec 501.2.5, latest edition, or an equivalent as approved by the engineer. Gravel shall be double-washed. The aggregate shall be sized according to AASHTO No. 4 aggregate (size number according to AASHTO M43) to meet the following gradation requirements:

|  |  |
| --- | --- |
| Sieve Size | Percent Passing by Weight |
| 2-inch | 100 |
| 1 1/2-inch | 90 to 100 |
| 1-inch | 20 to 55 |
| 3/4-inch | 0 to 15 |
| 3/8-inch | 0 to 5 |

Contractor shall submit sieve analysis by a qualified testing laboratory showing conformance with specifications. Submit sieve analysis to department for review and approval prior to installation.

**B.3 Sand**

A sand soil interface layer is required. The sand interface layer shall conform to the following specifications:

* 3 inches of sand shall be placed below the storage layer, and vertically mixed with the native soil interface to a depth of 2 to 4 inches.
* The sand shall meet the same requirements specified above in the Engineered Soil materials section for sand.

Contractor shall submit sieve analysis by a qualified testing laboratory showing conformance with specifications. Submit sieve analysis to department for review and approval prior to installation.

**B.4 Pea Gravel**

A pea gravel interface between the engineering soil and gravel storage layer is required. The pea gravel shall conform to the following specifications:

* The pea gravel layer shall be at least 4 inches thick. Pea gravel shall be washed. Pea gravel shall be large enough to prevent its falling through the perforations of the underdrain pipe. The pea gravel shall be sized according to AASHTO No. 8 aggregate (size number according to AASHTO M43) to meet the following gradation requirements:

|  |  |
| --- | --- |
| Sieve Size | Percent Passing by Weight |
| 1/2-inch | 100 |
| 3/8-inch | 85 to 100 |
| No. 4 | 10 to 30 |
| No. 8 | 0 to 10 |
| No. 16 | 0 to 5 |

Contractor shall submit sieve analysis by a qualified testing laboratory showing conformance with specifications. Submit sieve analysis to department for review and approval prior to installation.

**B.5 Clean-Out Port**

The underdrain pipe shall have two vertical, connecting standpipes to serve as a clean-out port for the underdrain pipe. The pipe, fittings, and cap shall be rigid, non- perforated SDR-35 PVC pipe, a minimum of 8 inches in diameter and covered with a watertight cap that is 3 inches above the finished surface elevation of the bioretention facility.

The contractor shall submit shop drawings of clean-out port showing conformance with specifications. Submit shop drawings to the department for review and approval prior to installation.

**C Construction**

Contractor shall notify the department following the excavation of bioretention facility, prior to installation of underdrains, backfill materials, and engineered soil media. Contractor shall only proceed with the installation of underdrains, backfill materials, and engineered soil media with approval of the engineer or department.

The contractor shall have five years’ experience (minimum) and shall have completed work similar in material, design, and extent to that indicated for this project. Contractor must provide five or more successful installations of green infrastructure projects.

**C.1 Site Stabilization**

Contractor shall not construct bioretention facility until all of the contributing drainage areas are stabilized to the satisfaction of the engineer or department. Do not use the bioretention facility as temporary sediment control facilities during construction. It is the responsibility of the contractor to sequence the construction of the bioretention facility in a manner such to prevent sediment from entering the bioretention facility as a result of construction activities.

Construction site runoff from disturbed areas shall not be allowed to enter the bioretention facility. Sediment that enters the bioretention facility during construction as a result of construction activities shall be removed by the contractor at no cost to the department. In circumstances where, in the opinion of the engineer or department, sediment significantly impacts the functionality of the underdrains, backfill materials, engineered soil media, or plantings, these items shall be completely replaced by the contractor at no cost to the department.

Contractor shall not store any equipment or materials within the perimeter of the bioretention engineered soil media area. Engineering soil shall be delivered to project site and installed no more than seven days before the start of planting operations for areas receiving engineering soil. It is the sole responsibility of the landscape contractor to fully coordinate and schedule the delivery and installation of the Planting Mix with the delivery and installation of all landscape plant materials.

**C.2 Suitable Weather**

Construction of the bioretention facility shall be suspended during periods of rainfall or snowmelt. Construction shall remain suspended if ponded water is present or if residual soil moisture contributes significantly to the potential for clumping or other forms of compaction within the bioretention facility. Contractor shall provide, in writing to the engineer, a list of all materials used in Planting Mix including manufacturers and quantities and shall ensure that all materials meet the standards set forth in standard spec 625 and 632 and produce a planting mix that provides a stable, healthy soil for plant growth.

**C.3 Compaction Avoidance**

Compaction and smearing of the soils beneath the floor and side slopes of the bioretention area, and compaction of the soils used for backfill in the soil planting bed, shall be minimized. During site development, the area dedicated to the bioretention area shall be cordoned off to prevent access by heavy equipment. Acceptable equipment for constructing the bioretention strategy includes excavation hoes, light equipment with turf type tires, marsh equipment or wide-track loaders.

If compaction occurs at the base of the bioretention facility, the soil shall be refractured to a depth of at least 12 inches. If smearing occurs, the smeared areas of the interface shall be corrected by raking or roto-tilling. Refracturing shall not be used by contractor in lieu of proper compaction avoidance techniques.

**C.4 Placement and settling of engineered soil**

The following apply:

* Prior to placement in the bioretention facility, the engineered soil mixture shall be premixed and the moisture content shall be low enough to prevent clumping and compaction during placement. The engineer or department will review the bioretention soil mixture upon completion of premixing and before delivery to the site. No onsite mixing of soils shall be allowed. Only approved tested material shall be delivered to the site.
* The engineered soil mixture shall be placed in multiple lifts, each approximately 12 inches in depth.
* As approved by the engineer or department, steps may be taken to induce mild settling of the engineered soil bed as needed to prepare a stable planting medium and to stabilize the ponding depth. Vibrating plate-style compactors shall not be used to induce settling.
* The entire soil planting bed shall be mulched prior to planting vegetation to help prevent compaction of the planting soil during the planting process. Mulch shall be pushed aside for the placement of each plant.

**D Measurement**

The department will measure Bioretention Pond Items as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.04 | Bioretention Pond Items | LS |

Payment is full compensation for furnishing and installing all materials.

1. Pebble Creek Debris Removal, Item SPV.0105.05.

**A Description**

This special provision describes removing rock and concrete debris from Pebble Creek under Structure B‑67‑314 according to the applicable portions of standard spec 204 and standard spec 205, as shown on the plans, and as follows.

**B (Vacant)**

**C Construction**

All rock and concrete debris larger than 6 inches shall be removed as directed by engineer and according to the plan details by use of manual labor. No in stream disturbance of Pebble Creek from the use of equipment will be allowed to perform this work. Equipment located outside of Pebble Creek may be used to assist with removal of debris by lifting items placed in roped netting or other approved device.

This work shall be performed during low water conditions in August 2019 in conjunction with the construction of Structure B-67-314.

Hydro excavation equipment may be utilized to facilitate removal of gravel provided that only the hose is in stream. The work operations for use of hydro excavation equipment shall be approved by the department and will be limited to one day of operation.

**D Measurement**

The department will measure Pebble Creek Debris Removal a single lump sum unit of work for all services, 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.0105.05 | Pebble Creek Debris Removal | LS |

Payment is full compensation for removing existing rocks and concrete debris under the structure, and for disposal of surplus debris.

1. Remove Loop Detector Wire and Lead-in Cable, STH 59 and CTH X/Saylesville Rd, Item SPV.0105.42.

**A Description**

This special provision describes removing loop detector wire and lead-in cable at the intersection of STH 59 and CTH X. Removal will be according to standard spec 204, as shown in the plans, and as hereinafter provided.

**B (Vacant)**

**C Construction**

Notify the department’s Electrical Field Unit at (414) 266-1170 at least five working days prior to the removal of the loop detector wire and lead-in cable.

Remove and dispose of detector lead-in cable including loop wire for abandoned loops off the right-of-way.

**D Measurement**

The department will measure Remove Loop Detector Wire and Lead-in Cable (location) as a single lump sum unit of work for each intersection, 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.0105.42 | Remove Loop Detector Wire and Lead in Cable, STH 59 and CTH X/Saylesville Rd | LS |

Payment is full compensation for removing, scrapping, and disposing of material and incidentals necessary to complete the contract work.

1. Install State Furnished Traffic Signal Cabinet, STH 59 and CTH X/Saylesville Rd, Item SPV.0105.43; USH 18 and STH 59, Item SPV.0105.44; USH 18 and CTH D, Item SPV.0105.45; USH 18 and Madison Street, Item SPV.0105.46.

**A Description**

This special provision describes the transporting and installing of the state-furnished traffic signal cabinet, signal controller, and other cabinet equipment for traffic signals, and for making the cabinet fully operational as shown in the plans.

**B Materials**

Pick up the state-furnished materials at the department's Electrical Shop located at 935 South 60th Street, West Allis. Notify the department's Electrical Field Unit at (414) 266‑1170 and make arrangements for picking up the materials five working days prior to picking the materials up.

Provide all other needed materials in conformance with standard spec 651.2, 652.2, 653.2, 654.2, 655.2, 656.2, 657.2, 658.2 and 659.2.

Coordinate directly with the department’s traffic signal cabinet vender (TAPCO at (262) 814‑7327 or [rickk@tapconet.com](mailto:rickk@tapconet.com) / TCC at (651) 439‑1737 or mallwood@trafficcontrolcorp) to schedule the cabinet acceptance testing.

Coordinate with the department’s Electrical Field unit at (414) 266‑1170 to participate in the acceptance testing. The department has final determination of the cabinet acceptance testing date and time.

**C Construction**

Perform work according to standard spec 651.3, 652.3, 653.3, 654.3, 655.3, 656.3, 657.3, 658.3 and 659.3 except as specified below.

Request a signal inspection of the completed signal installation to the engineer at least five working days prior to the time of the requested inspection. The department’s Region Electrical personnel will perform the inspection.

Install the state-furnished traffic signal cabinet on the concrete control cabinet base the same day it is delivered to the site location.

**D Measurement**

The department will measure Install State-Furnished Traffic Signal Cabinet (location) as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.43 | Install State-Furnished Traffic Signal Cabinet, STH 59 and CTH X/Saylesville Rd | LS |
| SPV.0105.44 | Install State-Furnished Traffic Signal Cabinet, USH 18 and STH 59 | LS |
| SPV.0105.45 | Install State-Furnished Traffic Signal Cabinet, USH 18 and CTH D | LS |
| SPV.0105.46 | Install State-Furnished Traffic Signal Cabinet, USH 18 and Madison Street | LS |

Payment is full compensation for installing and testing the traffic signal cabinet and cabinet equipment; for furnishing and installing all other items necessary (such as, wire nuts, splice kits and/or connectors, tape, insulating varnish, ground lug fasteners, etc.) to make the proposed system complete from the source of supply to the most remote unit; and for clean-up and waste disposal.

1. EVP Detector Head Installations, STH 59 and CTH X/Saylesville Rd, Item SPV.0105.47; USH 18 and STH 59, Item SPV.0105.48; USH 18 and CTH D, Item SPV.0105.49; USH 18 and Madison Street, Item SPV.0105.50.

**A Description**

This special provision describes the transporting and installing of department furnished Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector Head Mounting Brackets at the intersections of STH 59 and CTH X, USH 18 and STH 59, USH 18 and CTH D and USH 18 and Madison Street.

**B Materials**

Use materials furnished by the department including: Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector Head Mounting Brackets.

Pick up the department furnished materials at the department’s Electrical Shop located at 935 South 60th Street, West Allis. Notify the department’s Electrical Field Unit at (414) 266-1170 and make arrangements for picking up the department furnished materials five working days prior to picking the materials up.

**C Construction**

Install the EVP detector heads, EVP Confirmation Lights and EVP detector head mounting brackets as shown on the plans. The department will determine the exact location to ensure that the installation does not create a sight obstruction. The contractor shall terminate the EVP cable ends and install the discriminators and card rack in the cabinet.

Notify the department’s Electrical shop at (414) 266-1170 upon completion of the installation of the Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector Head Mounting Brackets.

**D Measurement**

The department will measure EVP Detector Head Installations (location) as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |  |
| --- | --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT | |
| SPV.0105.47 | | EVP Detector Head Installations,  STH 59 and CTH X/Saylesville Rd | | LS | |
| SPV.0105.48 | | EVP Detector Head Installations,  USH 18 and STH 59 | | LS | |
| SPV.0105.49 | | EVP Detector Head Installations,  USH 18 and CTH D | | LS | |
| SPV.0105.50 | | EVP Detector Head Installations,  USH 18 and Madison Street | | LS | |

Payment is full compensation for transporting and installing of department furnished Emergency Vehicle Preemption (EVP) Detector Heads, EVP Confirmation Lights and EVP Detector head Mounting Brackets.

1. Transporting Signal and Lighting Materials at STH 59 and CTH X/Saylesville Rd, Item SPV.0105.55; USH 18 and STH 59, SPV.0105.56; USH 18 and CTH D, Item SPV.0105.57; USH 18 and Madison Street, Item SPV.0105.58.

**A Description**

This special provision describes the transporting of department furnished materials for traffic signals and intersection lighting.

**B Materials**

Transport materials furnished by the department including: monotube arms and luminaire arms (to be installed on monotube assemblies).

Pick up the department furnished materials at the department’s Electrical Shop located at 935 South 60th Street, West Allis. Notify the department’s Electrical Field Unit at (414) 266-1170 and make arrangements for picking up the department furnished materials five working days prior to picking the materials up.

**C (Vacant)**

**D Measurement**

The department will measure Transporting Signal and Lighting Materials at (Intersection) as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.55 | Transporting Signal and Lighting Materials at STH 59 and CTH X/Saylesville Rd | LS |
| SPV.0105.56 | Transporting Signal and Lighting Materials at USH 18 and STH 59 | LS |
| SPV.0105.57 | Transporting Signal and Lighting Materials at USH 18 and CTH D | LS |
| SPV.0105.58 | Transporting Signal and Lighting Materials at USH 18 and Madison Street | LS |

Payment is full compensation for transporting the monotube poles, monotube arms and luminaire arms (to be installed on monotubes). Installation of these materials is included under a separate pay item.

1. Temporary Vehicle Detection System for the Intersection of STH 59 and CTH X, Item SPV.0105.59; Waukesha Bypass and STH 59/Genesee Road, Item SPV.0105.60.

**A Description**

This work shall consist of furnishing, installing, maintaining and placing into operation a temporary non-intrusive vehicle detection system (NIVDS) at the intersection (Locations) as shown on the plans, and as directed by the engineer in the field.

**B Materials**

This specification sets forth the minimum requirements for a system that detects vehicles on a roadway and provides detection outputs to a traffic signal controller. The materials shall also include all brackets, mounting hardware, cable, terminations, interface panels, and all other incidentals for the installation of the non-intrusive vehicle detection equipment. This equipment shall meet the NEMA environmental, power and surge ratings as set forth in NEMA TS2 specifications.

All detection equipment, components, and terminations supplied under this item shall be fully compatible with the temporary traffic signal controller supplied for the project. The system architecture shall fully support Ethernet networking of system components. All required interface equipment needed for transmitting and receiving data shall be provided with the NIVDS.

The NIVDS shall provide flexible detection zone placement anywhere and at any orientation. Preferred detector configurations shall be detection zones placed across lanes of traffic for optimal count accuracy, detection zones placed parallel to lanes of traffic for optimal presence detection accuracy of moving or stopped vehicles. Detection zones shall be able to be overlapped for optimal road coverage.

**C Construction**

The temporary NIVDS shall be installed by supplier factory-certified installers and as recommended by the supplier and documented in installation materials provided by the supplier.

In the event, at installation or turn on date, a noticeable obstruction is present in line with the detection zone(s), the contractor shall be obligated to advise the engineer before setting the zone.

The non-intrusive vehicle detection system, as shown in the traffic signal construction plans, shall be complete, in place, tested, and in full operation during each stage of construction.

Maintain all temporary vehicle detection zones as the plans show or as the engineer directs. The temporary vehicle detection zones shall be set near the vicinity and with approximate distance from the stop bar as shown on the plans. Check temporary vehicle detection zones every other week and at the opening of each stage of temporary traffic signal operation to ensure that they are working properly and aimed properly. Periodic adjustment of the detection zones and/or moving of the temporary vehicle detection sensors may be required due to changes in traffic control, staging, or other construction operations.

Ensure the non-intrusive vehicle detection system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

**D Measurement**

The department will measure Temporary Vehicle Detection System for Intersection of (location) as a single lump sum unit of work, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.59 | Temporary Vehicle Detection System for the Intersection of STH 59 and CTH X | LS |
| SPV.0105.60 | Temporary Vehicle Detection System for the Intersection of Waukesha Bypass and STH 59 /Genesee Road | LS |

Payment is full compensation for furnishing and installing the temporary non-intrusive vehicle detection system, including cabling, mounting brackets, mounting hardware, terminations, interface panels, testing and set up; for periodic checking and resetting of detection zones; for periodic cleaning for dirt and dust build-up; and for removing all equipment at the completion of the project.

1. Temporary Infrared EVP System for the Intersection of STH 59 and CTH X, Item SPV.0105.61; Waukesha Bypass and STH 59/Genesee Road, Item SPV.0105.62.

**A Description**

This special provision describes furnishing, installing, and maintaining temporary infrared EVP systems at the temporary signalized intersection at (Locations), as shown in the plans.

**B Materials**

Furnish an infrared emergency vehicle preemption system compatible with the city of Waukesha system and users. Contact the city of Waukesha Engineering Department, Alex Damien, (262) 524-3907, [adamien@ci.waukesha.wi.us](mailto:adamien@ci.waukesha.wi.us) for information regarding the equipment needs and operational requirements of the emergency vehicle preemption system.

**C Construction**

The temporary infrared EVP system, as shown in the temporary traffic signal plans or as directed by the engineer, shall be complete in place, tested, and in full operation during each stage of construction.

Install the temporary infrared EVP system as shown in the plans and according to the manufacturer’s recommendations. Detectors may be mounted on the temporary traffic signal span wire or wood poles. It shall be the contractor’s responsibility to relocate the temporary infrared EVP detectors to a suitable location if there is impedance on the sensor operation. Arrange for testing of equipment prior to acceptance of the installation for each construction stage.

All cables associated with the temporary infrared EVP system shall be routed to the cabinet. Each lead shall be appropriately marked as to which EVP channel it is associated.

Periodic adjustment and/or moving of the temporary infrared EVP detectors may be required due to changes in traffic control, staging, or other construction operations.

Ensure that the temporary infrared EVP system stays in clean working order. Periodic cleaning of the equipment may be required due to dirt and dust build-up.

The temporary EVP system may not be used for the permanent installation.

**D Measurement**

The department will measure Temporary Infrared EVP System for the Intersection of (location), as a single lump sum unit of work per intersection, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0105.61 | Temporary Infrared EVP System for the Intersection of STH 59 and CTH X | LS |
| SPV.0105.62 | Temporary Infrared EVP System for the Intersection of Waukesha Bypass and STH 59/Genesee Road | LS |

Payment is full compensation for furnishing and installing all required equipment, materials, and supplies; for maintaining and changing the EVP detectors to match the plans, traffic control, and construction staging; for relocating the temporary EVP detectors due to construction activities, if required; for testing the EVP system for each stage and sub-stage of construction; for periodically cleaning all temporary EVP detectors; and for cleaning up and properly disposing of waste.

1. Watering Rootstock, Item SPV.0120.01.

**A Description**

This special provision describes furnishing, hauling and applying water areas planted with Rootstock 2 1/2-Inch, as directed by the engineer, and as hereinafter provided.

**B Materials**

When watering areas planted with plugs, use clean water, free of impurities or substances that might injure the seed.

**C Construction**

If rainfall is not sufficient, keep all pond plant plugs thoroughly moist by watering or sprinkling. Maintain soil moisture in the top 4 inches of pond plant plug areas, for 90 days after pond plant plug placement or as the engineer directs. Apply water in a manner to preclude washing or erosion. The topsoil shall not be left un-watered for more than 3 days during this 90-day period unless the engineer determines the soil moisture is adequate.

**D Measurement**

The department will measure Watering Rootstock volume by the thousand gallon units (MGAL), acceptably completed. The department will determine volume by engineer-approved meters or from tanks of known capacity.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0120.01 | Watering Rootstock | MGAL |

Payment is full compensation for furnishing, hauling, and applying the water.

1. Water for Seeded Areas, Item SPV.0120.02.

**A Description**

This special provision describes furnishing, hauling and applying water to seeded areas as the engineer directs and as follows.

**B Materials**

Furnish water that is clean, free of impurities or substances that might injure the seed.

**C Construction**

If rainfall is not sufficient, keep all seeded areas thoroughly moist by watering or sprinkling. The equivalent of one inch of rainfall and/or applied water per week shall be considered the minimum amount of water. Water for 30 days after seed placement or as the engineer directs. Apply water in a gentle and even manner to preclude washing or erosion. The topsoil shall not be left un-watered for more than 3 days during this 30-day period unless the engineer determines that it is excessively wet and does not require watering. Continue to water after seed germination to allow grass to become established.

**D Measurement**

The department will measure Water for Seeded Areas by volume by the thousand gallon units (MGAL), acceptably completed. The department will determine volume by engineer-approved meters or from tanks of known capacity.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0120.02 | Water For Seeded Areas | MGAL |

Payment is full compensation for furnishing, hauling, and applying the water.

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1. Wall Modular Block Mechanically Stabilized Earth C-67-88, Item SPV.0165.01; R‑67‑145, Item SPV.0165.03.

**A Description**

This special provision describes designing, furnishing materials and erecting a permanent earth retention system according 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 specialprovisiondescribes 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 Gravity 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 according 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 in the Hill Farms State Transportation Building in Madison or by calling (608) 266‑8494.

**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 electronically to the engineer and Bureau of Structures for review and acceptance. 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 according to Table 11.5.7-1 in AASHTO LRFD.

Design and construct the walls according 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 according to 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 according to 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 according to 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 depth (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 inches 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 according to 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 inches and longer than 25% of the nominal height of the unit, chips larger than 1 inch, have excessive efflorescence, or are otherwise deemed unacceptable by the engineer, shall not be used within the wall. A single block type and 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 to correspond with each 24 inch change in vertical wall height and at maximum spacing of 10 feet. 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 ±1/8 inch from the standard values published by the manufacturer. Blocks must have a minimum depth (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 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 (%)  40 cycles, 5 of 5 samples  50 cycles, 4 of 5 samples | ASTM C1262[1] | 1.0 max.[2][3]  1.5 max.[2][3] | N/A |

[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 Size No. 1 as given in standard spec 501.2.5.4. 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. f 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 (Tal) and nominal long-term connection strength, Talc as discussed below.

Nominal Long-Term Design Strength (Tal)

The wall supplier shall supply the nominal long-term design strength (Tal) used in the design for each reinforcement layer and shall be determined by dividing the Ultimate Tensile Strength (Tult) by the factors RFID, RFCR, RFD.

Hence,



where:

Tult = 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.

RFID = Strength reduction factor to account for installation damage to the reinforcement. In no case shall RFID be less than 1.1.

RFCR = Strength reduction factor to prevent long-term creep rupture of the reinforcement. In no case shall RFCR be less than 1.2.

RFD = Strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation. In no case shall RFD be less than 1.1.

Values for RFID, RFCR, and RFD shall be determined from product specific test results. Guidelines for determining RFID, RFCR, and RFD 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 Tac

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



where:

Tac = Nominal long-term reinforcement facing connection strength per unit reinforcement width at a specified confining pressure.

Tult = Ultimate tensile strength of the reinforcement for geogrids defined as the minimum average roll value (MARV) for the product.

CRcr = Long term connection strength reduction factor to account for reduced ultimate strength resulting from connection.

RFD = Strength reduction factor to prevent rupture of the reinforcement due to chemical and biological degradation.

Tac 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 CRcr shall be determined according to 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 according to 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 according to 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 according 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 according 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 sheepsfoot 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 according to 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 taunt 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://www.atwoodsystems.com/>. Ensure that the 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**

(1) 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 (structure) by the square foot, acceptably completed, measured at the front face of wall as defined by the pay limits the contract plans show. Unless the engineer directs in writing, a change to the limits indicated on the contract plan, wall area constructed above or below these limits will not be measured for payment.

**E Payment**

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

|  |  |  |  |
| --- | --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT | |
| SPV.0165.01 | Wall Modular Block Mechanically Stabilized Earth C-67-88 | SF |
| SPV.0165.03 | Wall Modular Block Mechanically Stabilized Earth R-67-145 | 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 and leveling pad; constructing the retaining system including drainage system; providing backfill, backfilling, compacting, developing/completing/documenting the quality management program, and performing compaction testing.

Payment limit for furnishing all walls is the line of minimum embedment per section B.2. No payment will be made for additional embedment detailed for construction purposes. Parapets, railings, and other items above the wall cap or coping will be paid for separately. Vehicle barrier and its support will be paid separately.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price for those items.

SPV.0165.03 (20170629)

1. Precast Panels For Post and Panel Walls, Item SPV.0165.02.

**A Description**

This special provision describes manufacturing, transporting and erecting the precast concrete panels according to the plans, the standard specifications, and as hereinafter provided.

**B Materials**

**B.1 General**

Provide precast panels that conform to the details shown on the plans.

Furnish steel reinforcement conforming to standard spec 505.

Furnish Grade A, A-FA, A-S, A-T, A-IS, or A-IP air-entrained concrete conforming to standard spec 501.

**C Construction**

**C.1 General**

Prior to fabricating panels, verify that no field modifications were made to the top of footing elevations. Field modifications will require adjustments to the panel heights listed on the plans.

**C.2 Placing Concrete**

Handle and place the concrete as specified in standard spec 502.3.5.

**C.3 Curing**

Cure the concrete panels by any of the methods specified in standard spec 502.3.8.

**C.4 Transportation, Storage, and Erection**

Handle, store, and erect precast panels in a way that prevents cracking or other damage to the panels. Discard and replace units damaged by improper handling or storing.

**D Measurement**

The department will measure Precast Panels for Post and Panel Walls by the square foot, acceptably completed.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0165.02 | Precast Panels for Post and Panel Walls | SF |

Payment is full compensation for furnishing all materials, including leveling blocks; manufacturing; transporting; placing precast panels.

1. Wall Modular Block Gravity R‑67‑145, Item SPV.0165.04.

**A Description**

This special provision describes designing, furnishing materials and erecting a permanent modular block retaining wall according 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.

**B Materials**

**B.1 Proprietary Wall Systems**

The supplied wall system must be from the department’s approved list of Modular Block Gravity 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 according 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 in the Hill Farms State Transportation Building in Madison or by calling (608) 266‑8494.

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 electronically to the engineer and Bureau of Structures for review and acceptance. 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 according to Table 11.5.7-1 in AASHTO LRFD.

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

Walls shall be designed for a minimum live load surcharge of 100 psf according to Chapter 14 of the WisDOT LRFD Bridge Manual or as shown 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 according to AASHTO LRFD 11.10.6. Internal stability shall also be considered at each block level. Calculations for factored stresses and resistances shall be based upon assumed conditions at the end of the design life. The width of the modular block from front face to back face of the wall shall be included in the design computations and shown on the wall shop drawings. 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 program 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 according to AASHTO LRFD 11.10.2.3.

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 concrete leveling pads. 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 6 inches, with 6 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 according to 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 type and 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 ±1/8 inch from the standard values published by the manufacturer. Blocks must have a minimum depth (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 1¾ 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 (%)  40 cycles, 5 of 5 samples  50 cycles, 4 of 5 samples | ASTM C1262[1] | 1.0 max.[2][3]  1.5 max.[2][3] | N/A |

[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 Size No. 1 as given in standard spec 501.2.5.4. 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.

A layer of Geotextile Type “DF” (Schedule B) shall be placed vertically between the backfill and the Type A backfill. The geotextile shall extend from the top of the leveling pad to 6 inches below the surface of the retained soil. The geotextile shall then wrap across the top of the Type A backfill to the back of block wall facing.

Backfill placed between retained soil and Type A backfill shall comply with the requirements for Granular Backfill Grade 1 as contained in standard spec 209.2.2. The contractor may substitute Type A Backfill for Granular Backfill Grade 1.

**C Construction**

**C.1 Excavation and Backfill**

Excavation and preparation of the foundation for the wall and the leveling pad shall be according to standard spec 206. 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 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.

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.

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.

**C.3 Wall Components**

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 according to the manufacturer’s directions.

**C.4 Geotechnical Information**

Geotechnical data to be used in the design of the wall is given on the wall plan. After completing wall excavation, 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 Gravity R‑67‑145 by the square foot acceptably completed, measured at the front face of wall as defined by the pay limits the contract plans show. Unless the engineer directs in writing, a change to the limits indicated on the contract plan, wall area constructed above or below these limits will not be measured for payment.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0165.04 | Wall Modular Block Gravity R‑67‑145 | 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 and leveling pad; constructing the retaining system including drainage system; providing backfill, backfilling, compacting, and performing compaction testing.

Payment limit for furnishing all walls is the line of minimum embedment per section B.2. No payment will be made for additional embedment detailed for construction purposes.

Parapets, railings, and other items above the wall cap or coping will be paid for separately. Vehicle barrier and its support will be paid separately.

Any required topsoil, fertilizer, seeding or sodding and mulch will be paid for at the contract unit price for those items.

SPV.0165.04 (20170629)

1. Geotextile Fabric Type FF, Item SPV.0180.01.

**A Description**

This special provision describes the furnishing, installing and removing of geotextile fabric and fabric hold down systems for filtering storm water as shown in the plans.

**B Materials**

Use type FF geotextile fabrics conforming to standard spec 645.2.1 except use a woven polypropylene fabric. Furnish type FF geotextile fabrics selected from the department's erosion control product acceptability list (PAL). Obtain copies of the erosion control PAL and prequalification procedure from the bureau of highway construction.

**C Construction**

Meet the pertinent requirements as set forth in standard spec 645.3 and as follows:

Install according to the plan details for the intended use in such a manner to preclude ripping and tearing of the fabric, or otherwise rendering the fabric or assembly ineffective for its intended use.

**D Measurement**

The department will measure Geotextile Fabric, Type FF by the square yard of surface area of the fabric placed, 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.0180.01 | Geotextile Fabric, Type FF | SY |

Payment is full compensation for furnishing, transporting, installing and removing the fabric and fabric hold down systems.

1. Salvaged Sundrop Topsoil, Item SPV.0180.02.

**A Description**

This special provision describes removing topsoil in which native Sundrop seeds have fallen, temporary stockpiling the topsoil/seed mixture and replacing topsoil/seed mixture around specified locations adjacent to the Glacial Drumlin Trail to re-establish the native Sundrop plants after construction according to the plan details and as hereinafter provided.

**B Materials**

Conform to the requirements of spec 625.2.

**C Construction**

Conform to the requirements of spec 625.3.

**D Measurement**

The department will measureSalvaged Sundrop Topsoil by the square yard of surface area, 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.0180.02 | Salvaged Sundrop Topsoil | SY |

Payment is full compensation for stripping the topsoil/seed mixture, temporarily stockpiling and replacing.

1. Rootstock Protection, Item SPV.0180.03.

**A Description**

This special provision describes installing rootstock protection for wetland plantings as shown on the plans and as hereinafter provided.

**B Materials**

Furnish posts that consist of 1-inch by 2-inch by 5-foot wooden stakes. Furnish cross members that consist of biodegradable, natural organic fiber bailing twine.

**C Construction**

Install rootstock protection prior to the rootstock planting. Install posts a minimum of 2 feet into the ground or to a depth that secures the post and resists being pushed over. Install rootstock protection in such a manner as to provide a grid-like pattern 10 feet by 20 feet through the area of the rootstock plantings. Extend the perimeter of the Rootstock Protection to a minimum of 5 feet in all directions beyond the limits of the rootstock plantings.

Attach bailing twine, used as cross members, to all posts as shown in the plan. Attach bailing twine to the posts using knots or any other means approved by the engineer so that no more than 3 cross members may be affected if any one cross member breaks or becomes unattached. Use means approved by the engineer when bailing twine is attached to all intermediate posts. Maintain rootstock protection through the life of the contract, as needed, or within 24 hours of notification by the engineer.

**D Measurement**

The department will measure Rootstock Protection by the square yard of protection, 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.0180.03 | Rootstock Protection | SY |

Payment is full compensation for furnishing all materials, installing all posts, cross members, disposal of surplus materials; and for maintaining the rootstock protection through the life of the contract.

SER-632.1 (20161220)

1. Enhanced Turbidity Barriers, Item SPV.0180.04.

**A Description**

This special provision describes furnishing and installing enhanced turbidity barriers according to standard spec 628, the plans and as hereinafter provided.

**B Materials**

Provide materials conforming to standard spec 628.2.

**C Construction**

*Delete standard spec 628.3.10(2) and replace with the following:*

Place all barriers before beginning adjacent construction in a way that causes minimum disturbance of the streambed and banks. Extend the barrier into the stream banks far enough to preclude washing out or erosion around the ends. Drive posts securely into the streambed at 4 to 6 foot intervals along the line of the barrier installation. Fasten the barrier to the posts and securely anchor the barrier load lines at the barrier ends and at 4 to 6 foot intervals between the barrier ends, unless the engineer directs otherwise. Provide additional anchoring if necessary to maintain the barrier location during construction operations. Install a continuous line of rock bags to anchor the barrier to the streambed to isolate the work area. The engineer may require additional rock bags to ensure adequate performance. The contractor, as required by permit under standard spec 107.19, shall provide and anchor both danger buoys and navigational markers. One day prior to removing the enhanced turbidity barrier, remove the rog bags from the base of the barrier.

*Delete standard spec 628.10(5).*

**D Measurement**

The department will measure Enhanced Turbidity Barriers by the square yard of barrier, acceptably completed. The department will make no allowance for portions of the turbidity barrier considered as part of the anchorages, required overlaps or having a bottom flap greater than 48 inches.

**E Payment**

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

|  |  |  |
| --- | --- | --- |
| ITEM NUMBER | DESCRIPTION | UNIT |
| SPV.0180.04 | Enhanced Turbidity Barriers | SY |

Payment is full compensation for furnishing all materials including rock bags, buoys, navigational markers, anchors and anchor ropes, assembling, installing, maintaining, and for removing the turbidity barrier.

1. Salvaged Wetland Topsoil, Item SPV.0180.05.

**A Description**

This special provision describes removing wetland topsoil/peat mixture from the designated temporary impacted wetland areas, temporary stockpiling the wetland topsoil/peat mixture and replacing the wetland topsoil/peat mixture within the same wetland locations after the completion of the temporary construction activities according to the plan details and as hereinafter provided.

**B Materials**

Conform to the requirements of spec 625.2.

**C Construction**

Conform to the requirements of spec 625.3.

**D Measurement**

The department will measureSalvaged Wetland Topsoil by the square yard of surface area, 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.0180.05 | Salvaged Wetland Topsoil | SY |

Payment is full compensation for stripping the wetland topsoil/peat mixture, temporarily stockpiling and replacing the wetland topsoil/peat mixture once the temporary construction activities are completed.

1. Pipe Insulation Polystyrene, 2-Inch, Item SPV.0180.81.

**A Description**

This special provision describes furnishing and installing water main and pipe insulation according to the plans and as hereinafter provided.

**B Materials**

Provide water main insulation as shown on the plans.

All insulation shall be closed cell rigid polystyrene insulation board 2-Inch.

**C Construction**

Prior to placement of the insulation board, bring the indicated placement surface to the required lines, grades, and dimensions as shown on the plans. Smooth and shape the surface to eliminate any rocks, clods, or other items that may cause damage to the insulation board during placement or covering.

Where the existing water mains are within 24-inches of the storm sewer, or where rip rap is placed over existing water main, a minimum of 2-inches of closed cell rigid polystyrene insulation board intended for underground installation shall be placed between the two pipes.

Contractor shall provide insulation at the size and location as noted on the Water Main Details and Storm Sewer Layout plans.

Place the water main insulation board on the prepared surface at the locations and to the limits as shown on the plans. No vehicles or construction equipment shall be permitted to operate directly on the board.

After placement, cover the insulation board to the indicated depth with the type of material required on the plans or in the special provisions. Placing, spreading, and compacting of this material shall comply with the applicable sections of the standard specifications or special provisions. Place, spread, and compact the required backfill material so that the insulation board is not displaced or damaged. The engineer may require changes in equipment and/or operations to prevent such damage or displacement.

**D Measurement**

The department will measurePipe Insulation Polystyrene 2-Inch by the square yard of surface area, upon which the insulation board has been placed, 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.0180.81 | Pipe Insulation Polystyrene 2-Inch | SY |

Payment is full compensation for furnishing, transporting, and installing the pipe insulation.

1. Select Crushed Material For Wildlife Travel Corridor, Item SPV.0195.01.

**A Description**

Place select crushed material to fill voids and create a wildlife travel corridor, as shown in the plans and as hereinafter provided.

**B Materials**

Furnish select crushed material according to the pertinent requirements of standard spec 312. Material shall be clean and substantially free from material passing the No. 4 (4.75mm) sieve.

**C Construction**

Place the material after the heavy riprap has been completed. Place material such that voids in the finished surface are three inches or less in any dimension.

**D Measurement**

The department will measure Select Crushed Material for Wildlife Travel Corridor by the ton, 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.0195.01 | Select Crushed Material for Wildlife Travel Corridor | TON |

Payment is full compensation for providing, placing, and shaping the material.

1. Coarse Aggregate For Spring, Item SPV.0195.02.

**A Description**

This special provision describes aggregate for the spring conveyance material located on the construction details, as directed by the engineer, and as hereinafter provided.

**B Materials**

Washed natural gravel, crushed gravel, or crushed rock, free from dirt, clay balls, roots, and organic material, and meeting the following gradation requirements (ASTM C-33, Size No. 3).

Percent Passing

Sieve Size Passing By Weight

2-1/2-Inch 100

2-Inch 90 - 100

1-1/2-Inch 35 - 70

1-Inch 0 – 15

1/2-Inch 0 – 5

**C Construction**

Conform to the requirements of standard spec 209.

**D Measurement**

The department will measure Coarse Aggregate for Spring by the ton, 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.0195.02 | Coarse Aggregate for Spring | TON |

Payment is full compensation for providing, placing, and shaping the material.

1. Reconstructing Sanitary Manholes, Item SPV.0200.71.

*Conform to standard spec 611, except revise standard spec 611.3.5 and standard spec 611.3.7 with the following:*

**A Description**

This special provision amendment describes replacement or addition of the barrel, cone, chimney, frame, and cover. The barrel and cone sections shall be replaced in those locations indicated on the plans, and shall consist of a precast barrel and cone or slab section as site conditions dictate. The entire chimney shall be replaced with adjustment rings manufactured from Cretex Specialty Products, ARPRO Expanded Polypropylene (EPP) rings. Remove all existing rings and do not mix concrete and EPP rings.

**B Materials**

The rings shall be manufactured using a high compression molding process to produce a finished density of 120 g/l (7.5 pcf). Material shall be Pro-Ring as supplied by Cretex Specialty Products.

Any non-shrink mortar grout shall be Ipatop-Penngrout manufactured by IPA Systems, Inc. (www.ipasystems.com) or engineer approved equal. The material shall contain a balanced blend of washed and graded silica sand, finely ground Portland cement, and applicable special additive(s). Contractor must supply the engineer with verification of the product used.

Any adhesive or sealant used for watertight installation of the Pro-Ring manhole grade adjustment rings shall be M-1 Structural Adhesive/Sealant or equal meeting the following specifications:

* ASTM C-920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A and O.
* Federal Specification TT-S-00230-C Type II, Class A.
* Corps of Engineers CRD-C-541, Type II, Class A.
* Canadian Standards Board CAN 19, 13-M82.
* AAMA 802.3-08 Type II, AAMA 803.3-08 Type I and AAMA 805.2-08 Group C.

No other material shall be used in the construction of the chimney section beyond those materials indicated above. This includes wood shims, bricks, stones, etc.

**C Construction**

Reuse existing sanitary frames and covers for the following forcemain manholes owned by the City of Waukesha to be reconstructed:

* Station 268+12, 66’ LT along Waukesha Bypass southbound
* Station 269+34, 66’ LT along Waukesha Bypass southbound
* Station 269+65, 36’ RT along Waukesha Bypass northbound
* Station 270+25, 36’ RT along Waukesha Bypass northbound

Abandon the existing sanitary frames and covers for the following forcemain manholes owned by the City of Waukesha to be abandoned:

* Station 254+45, 26’ RT along Waukesha Bypass northbound
* Station 254+81, 4’ LT along Waukesha Bypass southbound

The adjustment rings shall be installed as follows:

* Installation and surface preparation shall be according to the manufacturer’s instructions.
* Repair any surface defects or irregularities of the top of the manhole using a uniform bed of non-shrink grout meeting the requirements noted below.
* The joint between the first grade ring and manhole cone shall be sealed using an adhesive/sealant meeting the requirements noted below.
* The joints between all manhole adjustment rings shall be sealed using an adhesive/sealant noted below.
* The joint between the top manhole adjustment ring and the frame shall not be sealed with adhesive/sealant. This joint shall be sealed with an internal frame‑chimney seal.
* All castings shall be centered over the opening of the corbel and adjusting rings. The top adjusting ring upon which the casting is set shall be level from side to side unless a pitch is required to match the existing surface in paved areas.

The contractor must adjust all manholes to final pavement grade. No other material shall be used in the construction of the chimney section beyond those materials specified. This includes shims of any material, bricks, stones, etc. If after pavement placement, foreign material is discovered (i.e. shims) in a chimney, the pavement surrounding the structure shall be removed and replaced at the contractor’s expense to the limits described below:

Required correction at manholes in concrete pavement:

* The contractor shall sawcut the concrete pavement along longitudinal and transverse joints in order to re-set the manhole chimney according to the specifications. The concrete areas to be removed must be full panels.
* Place new concrete around the manhole according to the concrete pavement section of these specifications.

Required correction at manholes in HMA pavement:

* The contractor shall sawcut the HMA pavement that is to be removed in order to re-set the manhole chimney according to the specifications.
* The HMA surface shall be milled from the flange to the nearest HMA pavement joint (if the structure is in the centerline, the area to be milled is flange to flange). The length of the milled area shall be equal to the width.
* The lower courses around the manhole shall be replaced and compacted.
* Place a tack coat and pave a new surface lift of HMA pavement that matches the existing HMA pavement and the re-set manhole.
* The seam created at the existing HMA pavement shall be infrared heated to blend and fuse the new HMA pavement to the existing.

**D Measurement**

The department will measure Reconstructing Sanitary Manholes by the vertical foot, acceptably completed.

**E Payment**

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

ITEM NUMBER DESCRIPTION UNIT

SPV.0200.71 Reconstructing Sanitary Manholes VF

Payment for Reconstructing Sanitary Manholes is full compensation for providing and installing all required materials and incidentals necessary to complete the contract work.