Wisconsin Department of Transportation

____ Region

Request for Proposals: Project Requirements

Book 2 Template

May 21, 2021

____ Design-Build Project

S.P. ____

Contract No. ____

Federal Project No. ____

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1 General

This section describes the relationships between Books 2 and 3 and provides a general description of the Project and those items included in the Basic Configuration. This section also includes a list of other projects in the vicinity of this Project.

1.1 Administrative Requirements

1.1.1 Introduction to Books 2 and 3

This introduction is intended to provide instructions to the Contractor on the relationship between Books 2 and 3. It does not replace the order of precedence set forth in Book 1. Book 1, Section 1.3 (Order of Precedence), defines the order of precedence for the Contract Documents. If there are any conflicts between this introduction and Book 1, Section 1.3 (Order of Precedence), Book 1 will control.

Book 3 sets forth the standards applicable to the Project. Some standards have been modified for application to the Contract. Those modified standards are identified in Book 3. Book 3 includes Technical Memoranda that modify the Wisconsin Department of Transportation (WisDOT, or Department) manuals; Special Provisions that modify the Standard Specifications; and Design-Build modifications to WisDOT manuals, Standard Specifications, and Special Provisions. Do not use any WisDOT Special Provisions or Technical Memoranda not included in Book 3 without prior approval from the Department.

Book 2 sets forth requirements that are intended to apply to this Project. Book 2 incorporates the standards in Book 3 by reference. In many cases, Book 2 will modify, supplement, replace, or incorporate portions of the standards in Book 3.

The text of Book 2 will take higher precedence than the exhibits of Book 2 unless otherwise specified.

1.1.2 General Project Description

Do not rely solely on the physical description contained in this section to identify all Project components. Determine the full scope of the Project through thorough examination of the request for proposals (RFP) and the Project Site, or as may be reasonably inferred from such examination.

Project Work generally includes:

- Clearing, grubbing, and removals
- Grading and earthwork
- Roadways
- Bridges

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- Noise and retaining walls
- Assisting WisDOT with the Public Information program
- Environmental compliance, permitting, and mitigation
- Reconstruction, relocation, and coordination of utilities
- Drainage facilities, including storm sewers, detention ponds, and filtration/infiltration ponds
- Incorporation of visual quality elements
- Traffic signals, lighting, signing, and pavement markings
- Intelligent transportation systems (ITS)
- Maintenance of traffic
- Bicycle and pedestrian facilities

1.1.3 Project Location

The Project is located on [insert name of road/street] and surrounding streets in [insert name of county] County in the cities of [insert name of city] and [insert name of city], Wisconsin.

1.2 Design Requirements

1.2.1 Basic Configuration

The Basic Configuration is defined as those portions of the Preliminary Design Drawings for which the design elements cannot be changed. Profiles and typical sections are not part of the Basic Configuration unless specifically noted. The Basic Configuration elements are as follows:

- Widths of all lanes and shoulders. Indicated widths are minimums.
  - Rural shoulders are measured to the edge of their paved width.
  - Urban shoulders are measured to the face of the curb.
- Widths of pedestrian shared-use paths, trails, and sidewalks. Indicated widths are minimums.
- Lengths of turning, acceleration, deceleration, escape, and auxiliary lanes (indicated lengths are minimums).
- Number of bridges, through lanes, turn lanes, shoulders, shared-use paths, and sidewalks.
- Intersection and interchange types and their associated traffic movements. Intersection and interchange types can be changed if the process specified in Book 2 Section 11.3.3 is completed.
- General location and number of access points to/from I-[insert #].

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- The northern and southern limits of new pavement on I-[insert #] mainline.

1.3 Construction Requirements

1.3.1 Other Projects in the Vicinity of the Project

Coordinate Work and cooperate with the holders of separate contracts in the vicinity of the Project, including both present and future contracts.

The following projects are known or anticipated at this time:

- [insert project name]

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2 Project Management

2.1 General

Project management includes Work associated with administrative and technical management of the Project. Specific management functions and Work detailed in this section include:

- Cost management
- Safety management
- Schedule management
- Human resource management
- Civil rights management

2.2 Administrative Requirements

Following Notice to Proceed 1 (NTP1), develop a file structure and a document control system that incorporate the activities identified in the activity breakdown provided in the Critical Path Method (CPM) Schedule.

2.3 Cost Management

2.3.1 General

the Department will compute any incentives or disincentives based on a unit bid price from Bid Express.

2.3.2 Administrative Requirements

2.3.2.1 Payment Breakdowns

Following NTP1, develop a payment breakdown based on the Price Proposal and the activity breakdown in the CPM Schedule. Document this breakdown in an Original Payment Breakdown. Clearly link all activities in the Original Payment Breakdown to specific items in the Price Proposal. If a specific item in the Price Proposal is associated with a form that further breaks down the cost of the item, clearly link the activities in the Original Payment Breakdown to the specific items in the form.

Submit an Original Payment Breakdown to the Department as a condition of NTP2. the Department will respond within 20 Working Days of receipt of the Original Payment Breakdown.

During the course of the Project, incorporate any approved changes to the payment breakdown, and document the new payment breakdown in a Revised Payment Breakdown. In all payment

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breakdowns, show the total cost per item and the cost per billing period for each item. Ensure that all cost breakdowns are consistent and total up to the Contract Price.

Submit the Revised Payment Breakdown to the Department after any change to the approved Payment Breakdown. the Department will respond within 20 Working Days of receipt of the Revised Payment Breakdown.

Within 30 Days of NTP1, provide a breakdown of the design hours and design costs for the Project in accordance with the following:

- Provide in an electronic Excel spreadsheet.
- List all major design milestones for each package, including 30 percent, 60 percent, and Released for Construction (RFC) submittals. Standards for the submittal will follow the requirements as laid out in the Facilities Development Manual (FDM).
- List budgeted expenses per activity.

2.3.2.2 Invoices

the Department reserves the right to withhold processing an invoice if Contract requirements for preparing and submitting invoices are not met. Structure the billing periods to occur monthly. Include the following as applicable on the invoice cover sheet:

- Project numbers (federal, state, and state aid) and title
- Invoice number (numbered consecutively starting with “01”)
- Period covered by the invoice (specific days)
- Total earned to date for the Project as a whole and for each Work segment, if any
- Authorized signature of the Design-Build Project Manager (PM)
- Date that invoice was signed

On a monthly basis at a minimum, meet with the Department to review the following prior to submitting invoices:

- Activity percent complete, which reflects physical percent complete estimated by field personnel, relating to a cost-loaded schedule activity
- Incorporation of approved Change Orders as individual activities with proper title, coding by Change Order number, associated logic, duration, and cost loading
- Verification of any unit price items
- Status of outstanding Non-conforming Work and Warranties
- Backup documentation for cost-reimbursable procurement and Change Order schedule activities

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Submit with the invoice an electronic copy of the billing spreadsheet and an updated schedule in an electronic medium compatible with the Department's software.

2.3.2.2.1 Invoice Calculations

the Department will base payments on the Department's estimate of physical percent complete of the Work, not on measured quantities, except where specifically stated in the Contract. The payment to the Design-Builder will be the amount shown on the Design-Builder's approved invoice less deductions made by the Department.

The following Project Management items will primarily be paid by prorating the remaining balances for those items over the time remaining until Substantial Completion. These prorated payments will not begin until after NTP2 or [enter date], whichever is later. However, payments for certain large deliverables or activities included within these items, such as the completion of significant process manuals or the performance of quality assurance for preparation Work, may be broken out from the prorating and paid with individually calculated amounts similar to other Project payments prior to NTP2, or the date above.

- Contract Management (includes Cost Management and Schedule Management)
- Quality Management
- Public Information Management
- Environmental Management

Payment for mobilization below 5 percent of the total Contract Price will occur in accordance with the following provisions. Mobilization exceeding 5 percent of the total Contract Price will be paid in a prorated manner similar to Project Management items.

- 25 percent will be paid at NTP1.
- 50 percent will be paid when 10 percent of the original Contract amount has been earned. Earned value does not include the costs of bonds, insurance, and prior mobilization payments.
- 25 percent will be paid when 25 percent of the original Contract amount has been earned. Earned value does not include the costs of bonds, insurance, and prior mobilization payments.

No direct payments will be made for insurance premiums; compensation for such costs is included in the Mobilization and Management line items.

The Department will base payments for design on estimated percentage complete for each RFC package, with the following limitations:

- A maximum of 90 percent will be paid when RFC documents have been issued.
- A maximum of 95 percent will be paid when construction is complete.
- A maximum of 100 percent will be paid when all As-Built Documents have been accepted.

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2.3.2.3 Progress Reports

Provide a monthly progress report that summarizes the information identified below and the monthly reports required in other Book 2 sections. Provide an electronic copy of the progress report in an executive summary format.

Include the following in a monthly progress report:

- Summary of Work performed during the previous month, including digital color photographs of the Project progress
- Safety
  - Summary of Project accidents (frequency and severity) and corrective actions taken
  - Updates to emergency services access points to the Project Site
  - Updates on safety training provided
- Labor compliance
  - Total monthly labor hours for construction/maintenance and non-construction personnel by classification of management, engineering, and other technical personnel used on the Project
  - Disadvantaged Business Enterprise (DBE) progress and Project updates
  - Equal Employment Opportunity (EEO) progress and Project updates
  - Update on labor compliance unresolved issues
- Quality updates
  - Summary of quality audits and quality control processes performed
  - List of non-conformances and resolutions
  - Summary of Quality Manual updates
- Public information updates
  - Summary of public input received and responses
  - Summary of media contacts
  - Summary of complaints and resolutions
  - Summary of Project partner contacts
- Environmental compliance
  - Summary and copies of environmental monitoring reports
  - Summary of non-compliance issues and resolutions
  - Summary of agency inspections

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- Change Orders
  - Summary of outstanding Change Orders
  - Summary of executed Change Orders

2.3.3 Cost Management Deliverables

Table 2-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 2-1: Non-exhaustive List of Cost Management Deliverables

Name	Acceptance or Approval	Section Reference
Original Payment Breakdown	Approval	2.3.2.1
Revised Payment Breakdown	Approval	2.3.2.1
Design Breakdown Report	Review and Comment	2.3.2.1
Invoices	Approval	2.3.2.2
Monthly Progress Reports	Approval	2.3.2.3

2.4 Schedule Management

2.4.1 General

This section contains the requirements for preparing and submitting a CPM Schedule using Primavera P6 software to plan and schedule all Work. Complete and maintain a computerized CPM Schedule as described herein.

2.4.2 Administrative Requirements

2.4.2.1 Schedule Settings

Use the following settings when beginning a P6 schedule.

- **Global and Enterprise Data.** The schedule may not contain any global or enterprise data (i.e., calendars or activity coding).
- **Total Float Calculations.** Set Total Float to "finish Float = late finish-early finish."
- **Retained Logic.** Calculate the schedule using Retained Logic. This method maintains all predecessor relationships and will not allow the remaining portions of an in-progress task to resume until its predecessor is complete. It is the responsibility of the Design-Builder to work in sequence. WisDOT may analyze the schedule with "Progress Override" and require any illogical results of Retained Logic to be corrected prior to the schedule's acceptance.
- **Percent Complete Type.** Use "physical" as "% complete type."

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2.4.2.2 General Requirements

Closely coordinate changes to the schedule with WisDOT and obtain WisDOT's acceptance. If WisDOT deems that the Work is performed substantially out of sequence, demonstrate the impacts in accordance with the Time Impact Analysis (TIA) section contained herein.

Manage and work with each Subcontractor and Supplier to obtain information on activities for implementation and sequencing of the Work. Reflect Contract requirements and known limitations in the schedules.

Identify any condition or Work that impacts the Design-Builder's commencement of an activity as outside impacts to the Project schedule, such as work under another contract that affects the Project. In a case where Work affects or is affected by work under another contract and the affected contracts are being performed by the same contractor, coordinate the Work to minimize impacts to both contracts' Project completion dates.

2.4.2.3 Naming Convention

Use a file-naming convention as modeled in Table 2-2. If the schedule is not accepted, resubmit under the file name as modeled for the subsequent version. The ####-##-## indicates a placeholder for the State Project number.

Table 2-2: Progress Schedule Filename Convention

Schedules	Original Submission	1st Resubmission	2nd Resubmission
Initial Work Plan	####-##-##-IWP	####-##-##-IWPv2	####-##-##-IWPv3
Baseline CPM Schedule	####-##-##-BL01	####-##-##-BL01v2	####-##-##-BL01v3
Re-Baseline CPM Schedule	####-##-##-BL02	####-##-##-BL02v2	####-##-##-BL02v3
1st Update Schedule	####-##-##-UP01	####-##-##-UP01v2	####-##-##-UP01v3
2nd Update Schedule, etc.	####-##-##-UP02	####-##-##-UP02v2	####-##-##-UP02v3
Time Impact Analysis	####-##-##-TIA01	####-##-##-TIA01v2	####-##-##-TIA01v3
As-Built Schedule	####-##-##-AB	####-##-##-ABv2	####-##-##-ABv3

2.4.2.3.1 Schedule Narrative Report

Submit and include as an attachment in PDF format the Schedule Narrative Report. Include a narrative for each required schedule submittal as follows:

- Baseline CPM schedules will include:
  - Explanation of the overall plan to complete the Project, including where the Work will begin and how Work and crews will flow through the Project
  - The Working Days per week, number of shifts per day, number of hours per shift, the holidays to be observed, and how the schedule accommodates adverse weather days for each month or activity
  - A statement describing the status of required permits

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  - The quantity and estimated production rates for critical activities
  - Activities requiring coordination with The Department and/or third parties (e.g., utilities)
  - A statement identifying constraints and an explanation of the reason for and purpose of each constraint
  - A statement describing the reason for the use of each lag or lead
- Update Schedules will include:
  - A brief description of monthly progress
  - A description of the reasons for any changes made to the schedule
  - A statement describing the status of permits
  - Status of activities requiring coordination with the Department and/or third parties (e.g., utilities)
  - A description of the status of the scheduled Milestone dates. Elaborate on any differences from the previous submission
  - A statement explaining why the scheduled Milestone dates are forecast to occur before or after the Contract Milestone date
  - A description of unusual labor, shift, equipment, or material conditions or restrictions encountered or anticipated since the previous Update Schedule
  - A statement identifying any new constraints, and an explanation of the reason for and purpose of each constraint
  - A statement describing the reason for the use any new lag or lead
- Rebaseline Schedule Narratives will include:
  - A description of the reasons for any changes made to the schedule
  - A statement describing the status of permits
  - Status of Activities requiring coordination with the Department and/or third parties (e.g., utilities)
  - A description of the status of the scheduled Milestone dates; elaborate on any differences from the previous submission
  - A statement explaining why the scheduled Milestone dates are forecast to occur before or after the Contract Milestone date
  - A description of unusual labor, shift, equipment, or material conditions or restrictions encountered or anticipated since the previous Update Schedule
  - A statement identifying any new constraints and an explanation of the reason for and purpose of each constraint

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- A statement describing the reason for the use any new lag or lead

2.4.2.3.2 Gantt Chart Submission Reports

Submit and include as attachments in PDF format the Schedule Gantt Chart Reports produced out of the P6 Software. Submit an electronic file in Primavera P6.xer format for each schedule submittal in the current WisDOT version.

Include a narrative for each schedule submittal to include and discuss:

- A bar chart of all activities, sorted by Early Start and indicating Longest Path in red
- A bar chart sorted by Early Start for the Critical Path
- A bar chart containing only activities with Total Float less than 10 Days, sorted by Early Start, Upcoming, and Pending coordination required with WisDOT, or third parties
- Bar chart detailing impacts from outside schedule delays (e.g., utilities), if any

Include bar charts for each schedule submittal containing the following information:

- Activity ID and description
- Original Duration
- Remaining Duration
- Physical Percent Complete
- Early Start, Late Start, and Late Finish
- Total Float
- Include a title block and a timeline on each page. At a minimum, include the file name, revision, start date, finish date, data date, and run date in the title block.

2.4.2.4 Notice(s) to Proceed

2.4.2.4.1 Initial Work Plan Schedule(s)

As a condition of NTP1, submit an Initial Work Plan schedule to WisDOT as follows:

1. 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 WisDOT accepts the requested exceptions.
2. 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 The Department's review or approval. Activities other than construction activities may have durations greater than 28 Calendar Days (20 Business Days).

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3. Provide summary activities for the balance of the Project. Summary activities may have durations greater than 28 Calendar Days (20 Business Days).
4. The engineer will accept the contractor's Initial Work Plan or provide comments within 10 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.
5. 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.
6. Ensure the Initial Work Plan shows completing the Work within the interim completion dates and specified completion date.
7. 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.

2.4.2.4.2 Baseline CPM Schedule

Within 21 Calendar Days following NTP1, submit a Baseline CPM Schedule. Acceptance of the Baseline Schedule by WisDOT is a condition of NTP2. WisDOT will use the schedule to monitor the progress of Work.

1. 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 WisDOT accepts the 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).
    1.3. 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.
    1.4. Show completing the Work within interim completion dates and the specified completion date.

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1.5. Provide summary activities for the balance of the Project. Summary activities may have durations greater than 28 Calendar Days (20 Business Days).

1.6. Provide activities as necessary to depict third-party Work related to the contract.

1.7. 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.

1.8. With the exception of the Project Start Milestone and Project Completion Milestone, all activities must have predecessors and successors. The start of an activity will have a Start-to-Start or Finish-to-Start relationship with preceding activities. The completion of an activity will 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.

1.9. 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 WisDOT accepts a requested exception, the schedule should encompass all the time in the contract period between the starting date and the specified completion date.

1.10. Develop an anticipated cash-flow curve for the Project, based on the Baseline CPM.

Within 10 Working Days, WisDOT will accept the contractor's Baseline CPM schedule or provide comments to the contractor. The contractor will address WisDOT's comments and submit a revised Baseline CPM schedule within 10 Working Days after WisDOT's request.

If WisDOT requests justification for activity durations, provide information that may include estimated labor, equipment, unit quantities, and production rates used to determine activity duration.

WisDOT will accept the Baseline CPM based solely on whether the schedule is complete as specified in this section. WisDOT's acceptance of the schedule does not modify the contract or validate the schedule.

WisDOT will not consider requests for contract time extensions as specified in 00000 or additional compensation as specified in 00000 for delay until The Department accepts the Baseline CPM schedule.

2.4.2.5 Schedule Updates

Submit CPM updates monthly 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.

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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.

Within 10 Business Days of receiving each CPM Update, WisDOT will provide comments and either accept or reject the submitted schedule update. If necessary, WisDOT will schedule a meeting to address comments raised in the review. If the schedule is rejected, the contractor will address WisDOT’s comments and submit a revised CPM Update within 10 Business Days. Minimize the number of changes, and state within the narrative update the reasons for any changes to the schedule. WisDOT may elect to allow the Design-Builder to include modifications such as adding or deleting activities or modifying activity descriptions, durations, or logic without submitting a TIA as long as, in the sole opinion of WisDOT, the modifications do not:

- Alter the critical path(s) or near critical path(s)
- Extend the scheduled Completion Deadlines or milestone(s) compared to those shown on the current Accepted Working Schedule
- Disrupt the integrity or comparative relationship between the last Accepted Working Schedule
- Consume an “unreasonable” amount of Total Float
- Modify budget estimates on in-progress activities
- Delete in-progress activities with budget estimates

If, in the sole opinion of WisDOT, any proposed changes in planned Work will result in any of the above-stated conditions, submit a TIA as described herein.

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2.4.2.6 Acceptance of Schedule

WisDOT's review and acceptance of schedules will not waive any Contract requirements and does not relieve the Design-Builder of any obligation or responsibility for submitting complete and accurate information. By review and acceptance of the schedule, WisDOT does not endorse or otherwise certify the validity or accuracy of any part of the schedules. The responsibility for validity and accuracy of all schedules is the sole responsibility of the Design-Builder.

Errors or omissions within schedules do not relieve the Design-Builder from finishing all Work within the time limit specified for completion of the Contract. If, after a schedule has been accepted by WisDOT, and either the Design-Builder or WisDOT discovers that any aspect of the schedule has an error or omission, correct the schedule and indicate the effects within 10 Business Days.

2.4.2.6.1 Initial Work Plan and Baseline CPM Schedules

WisDOT will accept or return comments on submitted schedules within 10 Business Days after receipt. Address comments within 10 Business Days after WisDOT returns comments, unless directed otherwise by WisDOT. It is the Design-Builder's responsibility to meet with WisDOT as often as necessary to satisfy WisDOT's comments within said 10 Business Days.

2.4.2.6.2 Schedule Updates

Estimate physical percent complete and remaining duration of each activity for each schedule update.

If the Design-Builder intends to invoice for items such as materials on hand, record those costs in the "actual costs" field in the expense tab, with the "expense item" called "invoice."

Incorporate all Change Orders and costs into the schedule updates and include Change Order activity in the schedule. All Change Orders must be coded in accordance with the change management section contained herein.

Submit an updated schedule monthly, with invoices that accurately record the dates Work is started and completed.

2.4.2.6.3 Time Impact Schedules

The Department will accept or return comments on submitted schedules within 10 Days after receipt. Address comments within 10 Days after the Department has returned comment. It is the Design-Builder's responsibility to meet with the Department as often as necessary to satisfy the Department's comments within said 10 Days.

2.4.2.7 Weekly Look-Ahead Schedule

Submit weekly a detailed, forward-looking schedule (Look-Ahead Schedule) encompassing a period of at least 21 Calendar Days. This schedule may be a hand- or computer-generated bar chart and must specifically reference the applicable CPM activity ID. This Look-Ahead Schedule

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must have greater detail than the Working Schedule and define specific daily operations at each specific location to be performed during the upcoming 21-day period, including:

- Activities under way
- Planned Work for the upcoming 21 Calendar Days
- Critical requests for information (RFIs) and submittals, based on the CPM schedule
- Details on other activities not individually represented in the CPM schedule

2.4.2.8 Schedule Recovery

Whenever the current Working Schedule indicates negative Float, submit a TIA as described in the Time Impact Analysis section herein within 7 Calendar Days. Recover the negative Float regardless of fault of either party for past delays in the Time Impact Schedule. The requirement to recover negative Float regardless of fault is not a directive by the Department to accelerate the Work, but rather a directive to provide a proposal to complete Work within the available contract timeline. Any cure involving acceleration, at a cost to the Department, will be directed in writing from the Department prior to any execution of acceleration thereof.

2.4.2.9 Change Management

Provide the Department with the schedule activity(ies) affected, and document it in the Change Order. Incorporate all Change Orders into the schedule. Provide each Change Order with its own activity ID and assign to a cost account “SP#-CO.” Additionally, assign each Change Order to the activity code “DETL” with the value of the DETL code equal to the CO#.

2.4.2.10 Time Impact Analysis

Determine the effect of an impact as soon as possible, and do not wait to analyze the effects of an impact; this may require estimates of the duration of the impact. Submit a TIA any time the Design-Builder is unsure whether any one event, or accumulation of events, impacts a Completion Deadline. Failure to submit a TIA addressing the impact will be considered prima facie evidence that the Department was not afforded the opportunity to mitigate the impact. At any time, the Department may require the Design-Builder to demonstrate the impacts of any change, or proposed change, to the schedule via a TIA, and require the Design-Builder to submit the TIA within 7 Calendar Days of receiving the request, even if the Design-Builder believes that there is no impact to the schedule.

Include a statement in the TIA that there is “no effect to the schedule,” or include the following in the TIA:

- Time Impact Schedule
- Any associated cost burden or savings
- A narrative report developed specifically to demonstrate effects of deviations from the current Working Schedule, to include the following:

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- A detailed factual statement of the impact, and its cause, providing all necessary dates, locations, and items of Work affected and included in each impact
- The date or dates on which actions resulting in the impact occurred or conditions resulting in the impact became evident
- Identification and copies of all pertinent documents relating to such impact
- Basis for entitlement and identification of the provisions of the Contract that support the impact
- All, if any, concurrent Design-Builder-caused delays during the timeframe of the impact
- Affected activity ID(s) of the schedule for which the impact is to be presented and how they were affected
- Any additional information requested by the Department

The Department may accept the Time Impact Schedule as the new Working Schedule while parties determine associated cost burden or savings. All accepted Time Impact Schedules become the next Working Schedule, and the basis for the next Update Schedule submittal.

2.4.2.11 Float Suppression/Sequestered Float/Use of Float

Do not engage in Float suppression manipulations that have the net effect of sequestering Float time. The Design-Builder is not entitled to any compensation or damages on account of delays that could have been avoided by revising activity time or logic used to sequester Float and will exclude the Design-Builder's right to recover any delay damages or compensation. Lags/leads are subject to the consent of the Department. Remove any lags/leads and replace with an activity identifying the lag/lead upon request of the Department, regardless of prior acceptance on previous schedules.

The Design-Builder acknowledges that all Float is a shared commodity available to the Project and is not for the exclusive benefit of any party, but is instead an expiring resource available to accommodate changes in the Work, however originated. Contract time extensions for Contract performance will be granted only to the extent that delays or disruptions to affected Work paths exceed Total Float along those paths of the current Working Schedule in effect at the time of delay or disruption. It is understood that identified contingencies, as described in the "Calendar and Identified Contingency" section, become available Total Float as time elapses and the contingency was not used.

2.4.2.12 Early Completion

Should the Design-Builder intend to complete, or actually complete, the Work, or any portion thereof, earlier than any Completion Deadline, it is understood that the Project will benefit from the increase in shared Total Float. The Design-Builder agrees that delays are only based on impacts to the Completion Deadlines, not the Planned Early Finish date of the Schedule. Completion Deadlines can only be changed by an executed Change Order.

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2.4.2.13 Calendars and Identified Contingency

The duration of each activity includes the necessary workdays to actually complete the Work defined by the activity; contingency is not to be built into the durations. Each activity is assigned the appropriate calendar as it relates to each major item of Work. Each calendar, except the calendar utilized for tracking Working Days, includes contingent non-workdays, with Saturday or Sunday not allowed to be shown as a contingent non-workday. Estimate sufficient weather contingency for each activity affected by weather.

Submit a statement indicating duration (in hours) of the Design-Builder's normal workday as it relates to the Work week (e.g., M-F [10 hours] and Sat [6 hours] for each calendar). Contingency will be the number of indicated non-workdays compared to this statement.

If the Design-Builder does not submit a statement of normal Working Days, it will be considered prima facie evidence that the Design-Builder did not account for sufficient weather impacts.

2.4.2.14 Non-Compliance

The Design-Builder's refusal, failure, or neglect to diligently pursue timely acceptance of any schedule or TIA constitutes reasonable evidence that the Design-Builder is not executing the Work, or separable part, with the diligence that will ensure its completion within the applicable Completion Deadline and constitutes sufficient basis for the Department to exercise the following:

- Withhold an amount up to 100 percent of the estimated value of Work performed until the schedule is accepted.

2.4.2.15 Level of Detail

Cost-load the schedule as the basis to administer the payments to the Design-Builder and track production. Utilize cost accounts reflective of Price Proposal bid items and assign applicable cost-loaded activities to respective cost accounts. The costs assigned to schedule activities should add up to equal the price for each item identified in the Price Proposal and Instructions to Proposers (ITP) Price Proposal Form. The total cost of all schedule activities equals the Contract Price. If the Price Proposal Form is part of the ITP, use the activity code of "DETL" to represent the costs indicated on those forms; the code value indicates which form number the costs represent, and the "description" represents the name of the individual costs within the respective form.

The cost assigned to individual schedule activities may not artificially inflate, imbalance, or front-load the items. Substantiate an activity if the Department questions the definition, costs, or production rate of it.

Provide two user-defined fields to track Start Station and End Station for each activity.

At a minimum, make certain that each activity meets the following criteria:

- Has a unique activity description and contains a verb.

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- Has a duration of not more than 28 Calendar Days, unless otherwise authorized by the Department.
- Has at least one predecessor and one successor activity, except for Project start and finish, respectively.
- Expresses activity durations in Calendar Days.

Create the Baseline Schedule with sufficient detail to accurately reflect the complexity and numerous construction operations of this Project to the satisfaction of the Department. The minimum level of detail required is described below:

- Administration
  - Schedule milestones
  - Mobilization
  - All submittals (design packages, shop drawings, etc.)
  - The Department review periods
  - Utility notification and relocation, by utility
  - Material on hand (procured items) requests and payments:
    - Fabrication and delivery of piling
    - Structural steel fabrication and delivery, per structure
    - Drainage pipe, guardrail, sign structures, and signs
    - Permanent lighting facilities and permanent traffic signals
  - Planned roadway, lane, or shoulder closures that have the potential of liquidated damages if delayed
  - Substantial Completion
  - Punchlist
- Bridges
  - Test piling
  - Test holes
  - Embankment for each abutment location
  - Pile Installation, per bent, per structure
  - Drilled shaft installation, per pier, per structure
  - Pile caps, per bent, per structure
  - Footings, per pier, per structure
  - Columns, per pier, per structure

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  - Caps, per pier, per structure
  - End bents, per structure
  - Beam or girder erection, per structure
  - Diaphragms
  - Deck placement, per structure
  - Parapets, per structure
  - Erection and removal of falsework and shoring
  - Cure times
- Roadway
  - Traffic switches
  - Submission of job mix formula for asphalt pavement
  - Internal access and haul roads (location and duration in-place)
  - Clearing and grubbing by stationing and roadway
  - Major ITS installations
  - Excavation and embankment placed for each roadway
  - Drainage – by run with structures for each roadway
  - Retaining walls per location
  - Subgrade for each roadway
  - Base for roadway
  - Curb, barrier wall, and sidewalks for each roadway
  - Pavement (asphalt and/or concrete) for each roadway
  - Bridge approach slabs per location
  - Cure times
  - Guardrail for each roadway
  - Slope pavement or riprap
  - Roadway lighting for each roadway
  - Signing for each sign structure location and for each roadway
  - Striping for each roadway
  - Traffic signals per location
  - Topsoil, sodding, seeding, and mulching for each roadway

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- Landscaping
- Finishing roadway and final cleanup

2.4.3 Schedule Deliverables

Table 2-3, which lists Deliverables identified in Section 2.4, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 2-3: Non-exhaustive List of Schedule Deliverables

Name	Acceptance or Approval	Section Reference
Schedule Narrative Report	Acceptance	2.4.2.3.1
Gantt Chart Submission Reports	Acceptance	2.4.2.3.2
Initial Workplan Schedule	Acceptance	2.4.2.4.1
Baseline Schedule	Acceptance	2.4.2.4.2
Monthly Schedule Updates	Acceptance	2.4.2.5
Time Impact Analysis	Acceptance	2.4.2.10
Weekly Look-Ahead Schedule	Acceptance	2.4.2.7

2.5 Human Resource Management

2.5.1 General

This section describes the requirements of human resource management, including identifying Key Personnel, co-location, facilities, and equipment requirements.

2.5.2 Administrative Requirements

2.5.2.1 General

Ensure all personnel performing Work on the Project have the experience, skill, and knowledge to perform the Work assigned to them. Ensure all personnel performing Work on the Project also have appropriate required professional licenses and certifications.

2.5.2.2 Key Personnel

2.5.2.2.1 Minimum Requirements of Key Personnel

Key Personnel for the Project and minimum requirements are as follows.

- Design-Build PM
- Design-Build Construction Manager
- Design Manager
- Construction Quality Manager

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- Lead Roadway Engineer
- Lead Structural Engineer
- Contract Environmental Compliance Officer
- Traffic Engineer(s)
- Quality Manager
- Design Quality Manager
- Critical Path Method Scheduler
- Geotechnical Engineer
- Hydraulics Engineer/Water Resources Engineer
- Utility Coordination Manager
- Public Information Liaison
- Document Manager
- Safety Manager
- Visual Quality Manager
- Signal Design Engineer
- Lighting Design Engineer
- Signing Design Engineer
- Stormwater Pollution Prevention Plan (SWPPP) Designer
- Permitting Specialist

2.5.2.2.2 Approval of Key Personnel

The Department has the right to approve or reject the Design-Builder's Key Personnel prior to their participation on the Project. Such approval is based on the qualification requirements set forth above and elsewhere in the Contract Documents for all Key Personnel. Key Personnel approved prior to Contract award do not require additional approval by the Department to participate on the Project.

2.5.2.2.3 Deductions for Removal

Unless otherwise approved, the Design-Builder will be assessed a monetary deduction for Key Personnel who cannot meet the defined commitments to the Project, except for extenuating circumstances, such as the disability or death of the employee.

Retain the Design-Builder's Design-Build PM on the Project until Final Acceptance; if not, the monetary deduction to be assessed will be $50,000.

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The Design-Builder will be assessed a monetary deduction of $10,000 per person for the following Key Personnel who do not remain on the Project for the completion of their particular function:

- [name of position(s)]
- [name of position(s)]

For any changes in personnel, submit the qualification summaries and resumes of the individual and obtain written approval of the person's participation in the Project before his or her start of Work.

2.5.2.2.4 Replacement of Key Personnel

Notify the Department in writing of any proposed changes to Key Personnel and include a detailed resume summarizing the items set forth above and elsewhere in the Contract Documents. Do not replace any Key Personnel without the prior written approval of the Department. The changes will only be approved if the replacement Key Personnel are equally qualified or more qualified than the original Key Personnel.

2.5.2.2.5 Directory of Key Personnel

Prepare a directory of Key Personnel that includes the following information for each individual: name, Project title, Project office address, Project office location, email address, and telephone numbers (office and mobile). Keep the directory current throughout the course of the Project.

Submit the directory of Key Personnel within 7 Days of NTP1.

2.5.2.3 Additional Personnel

The following provides a brief job description and minimum requirements of additional personnel required for various contractual Work efforts. The below personnel may have other roles on the Project.

2.5.2.3.1 Additional Qualifications

TBD

2.5.2.4 Co-location and Office Facilities

2.5.2.4.1.1 *Field Office*

TBD

2.5.2.4.1.2 *Field Laboratory*

TBD

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2.5.3 Human Resources Deliverables

Table 2-4, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 2-4: Non-exhaustive List of Human Resources Deliverables

Name	Acceptance or Approval	Section Reference
Directory of Key Personnel	Acceptance	2.5.2.2.5
Changes in Key Personnel	Approval	2.5.2.2.4

If the Design-Builder proposes changes to Key Personnel, submit a request in writing setting forth the qualifications of the replacement(s) as required by Section 2.5.2.2 to WisDOT for approval.

Provide Project Office, Field Office, Field Laboratory, and all computers and networking equipment within 60 Days of NTP1.

2.6 Safety Management

2.6.1 General

Conduct all Work necessary to meet the requirements of safety management.

2.6.2 Administrative Requirements

Submit the Safety Management Plan within 30 Calendar Days of NTP1.

Provide and maintain a safe and sanitary work environment in accordance with Standard Specifications.

Respond to and resolve any safety concerns raised by WisDOT or the Occupational Safety and Health Administration (OSHA).

2.6.3 Design Requirements

2.6.4 Construction Requirements

Ensure all Work under this Contract complies with the requirements and standards specified by the Williams-Steiger Occupational Safety and Health Act of 1970, 29 USC 651, et seq., Public Law 91-596, as well as other applicable federal, state, and local laws. Do not require any laborer or mechanic to Work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his/her health and safety as determined under construction safety and health standards promulgated by the U.S. Secretary of Labor.

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2.6.5 Safety Deliverables

Table 2-5, which lists safety Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 2-5: Non-exhaustive List of Safety Deliverables

Name	Acceptance or Approval	Section Reference
Safety Management Plan	Approval	2.6.2

2.7 Civil Rights Management

2.7.1 General

This section contains management requirements associated with DBE businesses, contractor workforce, and other Civil Rights issues in addition to the goals and other requirements elsewhere in the Contract.

2.7.2 Administrative Requirements

Submit annual Federal Highway Administration (FHWA) 1391 forms, as included in Book 1, Exhibit D, for the Design-Builder (including all Subcontractors) to the WisDOT Office of Business Opportunity and Equity Compliance (OBOEC) no later than August 28 of each full construction season throughout the Project. Provide WisDOT OBOEC with the necessary assistance in obtaining FHWA 1391 forms from noncompliant Subcontractors. This requirement is separate from the FHWA 1391 form submission required at the time of award, although the award submittal satisfies the requirement for the calendar year in which it is submitted.

Prepare a DBE Plan and submit within 30 Days of NTP1.

Include in the DBE Plan how the Design-Builder will commit to:

- Broadcast opportunities that arise during the construction of the Project to DBE businesses.
- Mentor DBE businesses.
- Assist DBE businesses in overcoming challenges such as obtaining bonding, lines of credit, insurance, equipment, supplies, materials, etc.
- Assign one direct contact for the DBE businesses for questions on the Project.
- Incorporate DBE business development organizations and business associations into the effort to solicit DBE businesses.
- Ensure prompt payment to DBE business subcontractors following the receipt of payments from WisDOT, including methods to make these payments visible to WisDOT.

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- Provide dispute resolution with DBE business Subcontractors in the event of Contract performance issues.

WisDOT will review the plan for acceptance and comment on the effectiveness and transparency of the Design-Builder's approach to small business inclusion and the elimination of traditional barriers to their successful participation.

2.7.3 Meeting Requirements

The Design-Builder, as well as any Subcontractor performing 10 percent or more of the total Contract value, must attend monthly workforce monitoring meetings during the construction season. It will be the sole responsibility of the Design-Builder's Design-Build PM or specific designee to organize and chair each of the workforce monitoring meetings and to invite a representative from WisDOT OBOEC. The agenda for the meetings must include:

- Performance regarding established workforce participation goals
- Review of the employees hired
- Opportunities for future employment on the Project
- Identification of potential recruitment sources

2.7.4 Construction Requirements

TBD

2.7.5 Civil Rights Management Deliverables

Table 2-6, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 2-6: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
DBE Goal	Acceptance	2.7.2

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3 Public Involvement

3.1 General

Section 3 describes the requirements for meeting the Project public involvement objectives.

Project public involvement should occur early and often throughout the life of a Project, including the construction phase. The Project Public Involvement Plan (PIP) development occurs during the Project scoping process before the Design-Build contract is awarded. The PIP process is standard for WisDOT work per Chapter 6 of the Facilities Development Manual. The WisDOT Project Manager and Region Communications Manager (RCM) work jointly on the PIP to serve as a guide for outreach and public communication throughout the duration of the Project. Design-Build teams must refer to the PIP and consult with the Project Manager and RCM regarding application.

3.2 Administrative Requirements

3.2.1 Standards: Law, Rules, and Guidance

All public involvement efforts shall follow the methods described in the following documents, as applicable:

- All applicable federal and state laws and rules
- WisDOT Facilities Development Manual – Chapter 6, Public Involvement (FDM 6)
- WisDOT Facilities Development Manual – Chapter 23, Noise, Procedure 23-35-20, Likely To Be Incorporated Into The Project
- The Project PIP
- In This Together Business Coordination Guide
- The approved Project [insert #]
- Other written guidance, including interim guidance, as it applies to public involvement efforts

It is mandatory that the Design-Build team familiarize themselves with these documents to ensure required Project public involvement and communications are provided in an effective and continuous manner.

3.2.2 Responsibilities

3.2.2.1 Design-Builder Responsibilities

Schedule a public involvement review kick-off meeting with the WisDOT Project Manager and RCM to discuss the existing PIP and public involvement expectations over the life of the Project.

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Organize and facilitate coordination meetings with the WisDOT Project Manager and RCM as requested.

Provide opportunities (through methods as shown in FDM 6) for stakeholder questions, comments, and input over the life the Project to ensure that all relevant stakeholders are receiving communications and being provided opportunity for input.

Track communications to and from all stakeholder and report methods used, including dates and results of public involvement, to the WisDOT Project Manager and RCM at regular intervals.

Revise outreach methods as necessary to reach all relevant stakeholders.

Serve as the lead contact for all Project public stakeholder inquiries, excluding print/electronic media or local/state/federal government officials or Governor office inquiries.

Keep the WisDOT Project Manager and RCM informed about the Project scope, schedule, and status, including traffic control changes, to facilitate effective public involvement and modifications to the PIP.

Produce and provide the WisDOT Project Manager and RCM with deliverables described in Section 3.3.1 (*Deliverables*), facilities, and staff for in-person public involvement efforts associated with the Project.

Produce and provide the WisDOT Project Manager and RCM with deliverables described in Section 3.3.1 (*Deliverables*) and staff for virtual public involvement efforts associated with the Project.

3.2.2.2 WisDOT Project Manager and RCM Responsibilities

Invite the Region Environmental Coordinator (REC) to the kick-off meeting if needed.

Involve the REC in coordination and other meetings, as needed, over the life of the Project.

Review, recommend changes if required, and provide final approval for all public involvement deliverables provided by the Design-Builder going to the public prior to distribution by the Design-Builder.

Serve as the lead contact for interactions with print, broadcast, or electronic media, including distribution.

Serve as the lead contact for interactions with local/state/federal government officials or Governor office inquiries, including distribution.

Provide facilities, staff, and the online platform (for use by the Design-Builder) for virtual public involvement efforts associated with the Project.

Review results of all Design-Builder public involvement efforts and Design-Builder responses throughout the life of the Project.

Work with the Design-Builder to revise outreach methods as necessary to reach all relevant stakeholders.

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3.3 Design Requirements

3.3.1 Deliverables

The Design-Builder is responsible for producing and providing WisDOT with the following Project Deliverables, in draft form, for Public Involvement Meetings (PIMs) and other types of public engagement included in the PIP. Deliverables include, but are not limited to:

- Invitation letters – Using approved WisDOT communication templates
- Public involvement handout – Using approved WisDOT communication templates
- Exhibits for both the website and in-person formats
- Schedules
- Project layouts and plan sheets for both the website and in-person formats
- Detour and closure information for both the website and in-person formats
- Other materials as required for effective and continuous public communications identified by the Design-Builder, WisDOT Project Manager, RCM, and/or REC

This list of Deliverables is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract, existing or revised PIP, and/or requested by the WisDOT Project Manager or RCM.

Except for designs, plans, layouts, maps, and similar documents, Deliverables provided for public dissemination must meet Americans with Disabilities Act plain language and accessibility requirements, WisDOT style guide requirements, and any other requirements sent forth by WisDOT policy, procedure, or guidelines.

The Design-Builder will furnish requested Deliverables to the WisDOT Project Manager and RCM or third parties within 7 days of contact and notification by the WisDOT Project Manager, unless otherwise directed. The Design-Builder is responsible for obtaining WisDOT review and approval of all Deliverables prior to dissemination to third parties. The Design-Builder will only disseminate external information to third parties following approval of Deliverables by both the WisDOT Project Manager and RCM.

These deliverables are also summarized in Table 3-1 in Section 3.5 for easy reference.

3.3.2 Media and Governmental Relations

Contact the WisDOT Project Manager and RCM (or designated alternate contact at WisDOT, as provided by the WisDOT Project Manager) within 1 hour of any contact by print/electronic media, local/state/ federal government officials, or Governor office representatives. Only WisDOT employees shall respond to media or governmental inquiries. Design-Builder will craft responses, as necessary or as directed, by the WisDOT Project Manager or RCM.

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Provide information related to media queries to WisDOT's Project Manager and RCM in a timely manner to support WisDOT's communication with the media.

3.3.3 Public Involvement Scenarios

Public involvement has occurred throughout the scoping phase of this Project. Public involvement is also required during the Design-Build portion of this Project.

There are several different scenarios for which public involvement must be considered during the Design-Build process, including:

- Planned public involvement included in the existing PIP
- Additional public involvement required due to Project changes during the Design-Build process
- Public involvement required for noise barrier construction determinations
- Public involvement required due to planned or unplanned access changes or restrictions
- Public involvement required due to construction incidents or emergencies during construction

Detailed discussions of each of these scenarios follow.

3.3.3.1 Planned Public Involvement Included in the Existing Public Involvement Plan

The WisDOT Project Manager and RCM developed a PIP during the scoping phase of the Project. Public involvement efforts identified for completion during the Design-Build phase of the Project in the PIP should be reviewed and discussed during the public involvement review kick-off meeting cited in Section 3.2.2.1 (*Design-Builder Responsibilities*).

At a minimum, the existing PIP should be updated during the public involvement review kick-off meeting to include:

- Design-Builder public information staff contacts, roles, responsibilities, and relationship to the Design-Builder and WisDOT Project team
- Names of key stakeholders and contact information for Project communications, including Environmental Justice community representatives identified through the environmental document public involvement process, if applicable
- Identification of key communications issues, opportunities, and messages for achieving continuous stakeholder involvement and input
- Identification of the agreed-upon coordination approach with the WisDOT Project team, including the methodology to keep WisDOT informed with regular updates regarding Project progress, results of involvement activities, and key Project issues identified by stakeholders or those that may affect identified stakeholders

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- Description of outreach and information activities, including objectives for each activity, intended stakeholder groups affected by each activity, and relationship of each activity to the overall Project development phase
- Calendar of outreach activities, including regular reviews of PIP outcomes and revisions to the PIP
- Details of the emergency response communication program, as described in Section 3.3.3.5 (*Public Involvement Required Due to Construction Incidents or Emergencies During Construction*)
- Any other adjustments to the PIP agreed to between the parties participating in the public involvement review kick-off meeting

If a PIP was not developed during Project scoping, a Design-Build PIP shall be developed. The PIP template identified in FDM Procedure 6-5-10 shall be used to develop the Design-Build PIP and shall include the information described in the bullets above.

3.3.3.2 Additional Public Involvement Required Due to Project Changes During the Design-Build Process

An approved environmental document is secured prior to Notice to Proceed 1. Public involvement was an integral part of scoping, the selected alternative determination process, and development of the final environmental document. The scoping process established public expectations of how the selected Project alternative will meet the purpose and need for the Project, and how traffic patterns during construction, as well as construction duration, may impact residents and businesses. Additionally, the environmental document includes environmental commitments that must be met as described Book 2, Section 4 (*Environmental Compliance*). When Project design changes or other factors, as listed below, have the potential to change the established public expectations arrived at through the scoping and identified in the approved environmental document, the Design-Builder must immediately notify the WisDOT Project Manager, RCM and REC.

The following are examples of actions that may trigger the need to conduct additional public involvement:

- Changes in Project scope or design
- Changes to Project impacts and mitigation
- Changes to Project environmental, physical, or social context
- Changes or additions to previously disseminated detour routes, traffic patterns, and other elements of a Project Traffic Management Plan (TMP)
- Changes to the Project construction schedule

Upon notification, the WisDOT Project Manager, RCM, and REC will work with the Design-Builder to determine the appropriate level of public involvement to inform stakeholders

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about the Project changes. This may require updates to the PIP, as determined by the WisDOT Project Manager, RCM, and REC.

3.3.3.3 Public Involvement Required for Noise Barrier Construction Determinations

If a reasonable and feasible noise barrier(s) was identified during the environmental documentation process, the Design-Builder is responsible for delivering the public involvement process described in FDM Procedure 23-35-20, Likely To Be Incorporated Into The Project.

The WisDOT Project Manager, RCM, REC, and Central Office Noise Liaison will be responsible for review and approval of deliverables developed by the Design-Builder, providing WisDOT staff for the public involvement meeting, and oversight of each element of the public involvement process as stated in the FDM.

Following the noise barrier voting, the WisDOT Project Manager will provide the Design-Builder with the final determination regarding whether the noise barrier(s) should be incorporated into the Project.

The Design-Builder will be responsible for determining if the barrier(s) identified for incorporation into the Project remains reasonable and feasible through final design.

If the Design-Build process results in any barrier(s) previously identified as reasonable and feasible through the environmental documentation process being eliminated from consideration, the Design-Builder is responsible for working with the WisDOT Project Manager, RCM, REC, and Central Office Noise Engineer or Specialist to develop and deliver a public involvement process to inform the public of this determination.

3.3.3.4 Public Involvement Required Due to Planned or Unplanned Traffic Activities or Access Changes/Restrictions

The Design-Builder shall communicate all construction activities and maintenance-of-traffic activities that might affect stakeholders to WisDOT's Project Manager and RCM within 24 hours of being identified, and at least 10 days before the start of each activity. Provide email notification of both start and anticipated end times. Immediately notify the WisDOT Project Manager and RCM of changes to construction activities and maintenance-of-traffic activities so WisDOT can post the information on the website and disseminate it through other technologies. The Design-Builder shall not post, submit, mail, or use any technology to notify media or external audiences of unplanned traffic activities or access changes.

Construction elements/events requiring notification of stakeholder groups include:

- Road and lane closures and restrictions
- Detours and detour routes
- Access changes
- Nighttime work and changes to daily work hours

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- Construction sound levels that exceed environmental document commitments
- Changes to haul routes
- Utility shutoffs
- Changes to traffic control configuration

3.3.3.5 Public Involvement Required Due to Construction Incidents or Emergencies During Construction

Include in the updated PIP or Design-Build PIP a crisis communications approach for responding to incidents or emergencies during the Project. Establish and manage an emergency response communication program that includes the following:

- Designated Design-Builder staff and WisDOT contact names listed to respond to emergencies
- A list of potential incident and emergency types to be reported to the WisDOT Project Manager and RCM, including any unusual traffic conditions or incidents such as crashes, disabled vehicles, oversized vehicles, utility disruptions, adverse weather conditions (e.g., wind, ice, rain, and snow), and debris or animals on roadways
- A commitment that incidents and emergencies shall be report to the WisDOT Project Manager and RCM within 15 minutes of detection
- Approaches to addressing potential emergencies
- Causes of specific disruptions (e.g., weather, construction-related)
- Actions to be taken to alleviate problems, including steps to develop an emergency communications protocol for providing information to the WisDOT Project Manager and RCM so alerts can be given to print and electronic media and the traveling public
- Impact to the public and notification procedures
- Anticipated duration of disruptions
- Contact list of emergency service providers

3.3.4 Other Public Involvement Considerations

3.3.4.1 Electronic Information Dissemination

The Design-Builder, WisDOT, and local agencies will have information that may need to be disseminated to stakeholders or stakeholder groups electronically. The Design-Builder must:

- Assist the WisDOT Project Manager and RCM in disseminating electronic information about Project conditions during construction, changes to Project designs, and general Project information. WisDOT's primary electronic communication methods will be the

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Project website, email, variable message signs, the 511 Traveler Information system, and the 511 Construction Information website.

- Provide relevant information to the WisDOT Project Manager and RCM in a timely manner to ensure specific Project information (e.g., lane closures, roadway closures) is relayed to WisDOT's real-time 511 Traveler Information system and Regional Transportation Management Center (RTMC) using the appropriate format as identified by the Project Manager.
- Review the Project's public website weekly, and immediately notify the WisDOT Project Manager and RCM of any errors or outdated information.
- Following the weekly construction progress meetings, send weekly e-mail updates to the WisDOT Project Manager and RCM for distribution to internal and external audiences, describing current Project conditions, schedule updates, planned work activities, planned traffic impacts, contacts with Project stakeholders, and other relevant Project information. These email updates must include easily understood and adequate content to provide meaningful and understandable communications for internal and external audiences. More frequent updates may be required if conditions warrant. The WisDOT Project Manager and/or RCM will send the final information to the external audiences.

3.3.4.2 Other Methods of Information Dissemination

Electronic outreach may not be adequate to inform all stakeholders. The Design-Builder should regularly evaluate audiences receiving and responding to outreach activities. Working together with the WisDOT Project Manager and RCM, a determination should be made if additional activities are necessary to reach other stakeholders and stakeholder groups. Activities may include participation in community events, offers to appear at community organization meetings, or coordinating groundbreaking or ribbon-cutting ceremonies.

3.3.4.3 Outreach to Environmental Justice and Other Traditionally Underserved Populations

The Project PIP should identify Environmental Justice (EJ) and other traditionally underserved populations. Depending on the Project scope, an EJ Plan may be created for the Project. Examples of these populations may include minorities and low-income as defined in Executive Order 12898, persons with disabilities, children, the elderly, and the Amish, among others. These stakeholders may have specific transportation needs, such as transit routes and stops or shoulder access, that could be impacted by Project design and construction.

If not already included, the updated existing or new Design-Build PIP identified in Section 3.3.3.1 (*Planned Public Involvement Included in the Existing Public Involvement Plan)* shall include a section identifying the traditionally underserved populations affected by the Project and a list of public involvement methods to engage those populations.

Traditional electronic outreach and PIMs have been shown to be less effective with these populations. Other involvement methods should therefore be considered for inclusion in the

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PIP. These may include developing relationships with trusted community partners, door-to-door information distribution, posting meeting notices in locations such as libraries and food pantries, scheduling meetings at community facilities (as opposed to government facilities), providing childcare at meetings, using minority media outlets to distribute information, including Hmong radio stations, and other activities designed to bring information to the affected communities to ensure opportunities for participation in the Project development process.

3.4 Construction Requirements

3.4.1 Construction Site Information

In addition to all other legally required information displays, the Design-Builder will provide a sign at the Project construction office, if applicable, identifying the name of the Project and contact information, including a phone number, email address, and office hours.

3.5 Deliverables

Table 3-1, which lists Deliverables identified in Section 3, is not intended to be exhaustive. It is the Contractor's responsibility to develop and submit all Deliverables as required by the Contract. See Section 3.3.1 for detailed information on Deliverables, and Section 3.3.3 for details on potential Public Involvement Scenarios.

Table 3-1: Non-exhaustive List of Deliverables

Name	Potentially Relevant Scenario/Section
Updated PIP	3.3.3.1 3.3.3.2
Invitation Letters	3.3.3.1
Public Involvement Handout	3.3.3.1
Exhibits – Printed	3.3.3.1
Exhibits – Electronic	3.3.3.1
Schedules	3.3.3.1
Project Layouts and Plan Sheets	3.3.3.1 3.3.3.2 3.3.3.3
Detour and Closure Information	3.3.3.1 3.3.3.2 3.3.3.4 3.3.3.5

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4 Environmental Compliance

4.1 General

Section 4 describes the environmental compliance requirements related to physical, cultural, and natural factors, including floodplains, groundwater, noise, air quality, water quality and quantity, waters and wetlands, wildlife, hazardous materials, cultural and community resources, and permitting and communication around these issues. This section also describes the process for evaluating and managing design revisions that affect these factors, and for initiating and completing environmental document reevaluations if reevaluation thresholds are met. This section governs environmental compliance except as otherwise specifically stated herein. Requirements for erosion and sediment control are found in Section 14.

4.2 Administrative Requirements

4.2.1 Standards

In the event of a conflict between the standards set forth in Book 3, follow the order of precedence set forth below unless otherwise specified:

- Federal and State laws and regulations, including the Americans with Disabilities Act
- WisDOT Special Provisions
- WisDOT *Standard Specifications*
- WisDOT *Construction and Materials Manual* (CMM)
- WisDOT Facilities Development Manual (FDM)
- Remaining standards set forth in Book 3

4.2.2 Environmental Personnel and Training

Designate an Environmental Team led by the Contract Environmental Compliance Officer (CECO) to communicate directly with the WisDOT Project Manager and Region Environmental Coordinator (REC). The CECO is responsible for:

- Ensuring that all environmental laws are followed
- Ensuring that environmental commitments are met
- Monitoring and demonstrating that the terms of all environmental permits are met
- Working with the WisDOT Project Manager and REC to identify any necessary revisions to environmental permits
- Reporting on Project compliance with all environmental law and regulations, and terms of commitments and permits

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4.2.3 Meeting Requirements

4.2.4 Permits/Authorizations

4.2.4.1 Environmental Documents

WisDOT and Contractor commitments are provided in Exhibit 4-A (*Environmental Document*). Review Exhibit 4-A to determine all commitments required for this Project and comply with all commitments accordingly.

Prior to Final Acceptance, submit a comprehensive collection of all field memoranda, data collection sheets, and inspection logs related to environmental monitoring for all environmental commitments.

4.2.4.2 Permits

All permits that WisDOT is acquiring are anticipated to be complete prior to Notice to Proceed 1 (NTP1). Copies of those permits or permit applications are included in Exhibit 4-B. Work with the REC to obtain all other permits required for the Project, including permits not included in the Contract Documents and permits that must be modified as a result of the Work or changes to permit requirements. The CECO must coordinate with the REC to develop all permit applications, drawings, correspondence, Site Management Plans, and applicable Quality Manual processes for review prior to submittal. WisDOT will coordinate with the permitting agencies to obtain permit amendments.

Comply with the requirements of all permits. All permits and modifications to permits must be submitted and approved by the regulatory agencies prior to starting any Work associated with the applicable permit.

4.2.5 Permit Amendments

In the event that amendments to Project permits are required due to Project design changes, changes in the existing environment, changes in laws, rules, or codes or for any other reason, the Contractor will immediately notify the REC and WisDOT Project Manager. The REC and WisDOT Project Manager will work with the Contractor to amend the permits. The Contractor must coordinate these activities through WisDOT and not directly with other State, Tribal, or Federal agencies.

Table 4-1 summarizes the Environmental and Water Resource regulatory obligations on the Project and specifies whether WisDOT or the Contractor will be managing them. Additional obligations and environmental requirements are included in the ECQP found in Section 5 (*Quality Manual*).

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Table 4-1: Environmental and Water Resource Regulatory Obligations

Government Agency	Obligation	Responsible Party and Status
Local		
Drainage Districts		
Municipalities	Local Noise Ordinances	
State		
Wisconsin Department of Natural Resources (WDNR)	Wisconsin Pollutant Discharge Elimination System (WPDES)	WisDOT acquired
	Application for General Stormwater WPDES Permit for Construction Activity	Contractor to prepare; WisDOT to acquire
	Waterway Navigation Buoy Permit	Contractor to prepare; WisDOT to acquire
	Dredge Material Management Permit (if necessary)	Contractor to prepare; WisDOT to acquire
	Discharge of Contaminated Groundwater to Surface Water (as necessary)	Contractor to prepare; WisDOT to acquire
	Section 401 of the Clean Water Act	WisDOT to prepare and acquire. Contractor to prepare; WisDOT to acquire if modifications are made
	Asbestos Abatement for Bridges	Contractor to prepare and submit notification for abatement.
	Demolition of Bridges and Buildings	Contractor to prepare and submit notification for bridge demolition/renovation and building demolition to WDNR or WDHS as applicable.
Wisconsin State Historic Preservation Office	Section 106 Consultation	WisDOT completed
Tribal Historic Preservation Office(s)	Section 106 Consultation	WisDOT completed
Federal		
FAA	Submittal of Forms 7460-1 and 7460-2, Part II	WisDOT acquired Contractor to resubmit and acquire if modifications are made
U.S. Army Corps of Engineers	Section 10/404 Permit	WisDOT to prepare and acquire. Contractor to prepare; WisDOT to acquire if modifications are made
U.S. Coast Guard	Section 9 of Rivers and Harbor Act	WisDOT to prepare and acquire
U.S. Fish and Wildlife Service	Biological Opinion Programmatic Bald Eagle Agreement	WisDOT to prepare and acquire
US Department of Agriculture	Incidental take permit under Migratory Bird Treaty Act	Contractor to prepare; WisDOT to acquire

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4.3 Environmental Document Re-evaluation

4.3.1 Environmental Document Re-evaluation

An approved environmental document is secured prior to NTP1. That document includes environmental commitments that must be met as described elsewhere in this section. In the event that Project design changes or other factors, as listed below, require a re-evaluation of the approved environmental document, the Contractor must immediately notify the REC and WisDOT Project Manager. The REC will work with the Contractor to complete the Environmental Re-evaluation.

4.3.1.1 Environmental Re-evaluation Requirements

The following items may initiate the need to complete an Environmental Re-Evaluation:

- Changes in Project scope, design of the Project, or funding
- Changes in laws, rules, or codes
- Changes to the existing environment
- Changes to Project impacts and mitigation

Before beginning preparation of a Re-evaluation document, consultation must occur between the Contractor, the REC, the Environmental Process and Documentation Section liaison, and the Federal Highway Administration (FHWA) (if federal funding or a federal action is involved) to ensure the Re-evaluation is applicable; and if so, what information should be included and what level of public involvement is required.

4.4 Design Requirements

4.4.1 Hazardous Materials

Comply with Exhibit 4-C (Hazardous Materials Provision).

4.4.1.1 Known Hazardous Materials

Phase 1 Hazardous Materials Assessment (HMA), Phase 2/2.5, and/or Phase 3 documents are prepared by WisDOT to identify potential contaminated sites for the Project. Copies of the reports along with a list of contaminated sites and the affected area for the Project are provided by WisDOT. Follow the process in FDM Chapter 21 for the management of hazardous materials.

4.4.1.2 Known Hazardous Materials Compensation and Schedule

The Contractor is not entitled to an extension of a Contract deadline due to the excavation, hauling, stockpiling, handling, testing, treatment, and disposal of known Hazardous Materials.

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4.4.1.2.1 Soil and Materials Compensation

Include all costs for the excavation, hauling, stockpiling (for re-use or other purposes), handling, testing, treatment, and disposal of all known Hazardous Materials in the Contract Price.

The Contract Price includes on-Site reuse of low-level Contaminated Materials as specifically allowed by the Contract or otherwise approved by the Wisconsin Department of Natural Resources (WDNR) and WisDOT.

The hauling of known Hazardous Materials to or from the stockpile areas will be eligible for an increase in Contract Price only to the extent the haul distance increases over the Contractor's original plan. In such cases, provide proof of haul distance increases.

4.4.1.2.2 Groundwater Compensation

Include all costs (treatment systems, permitting, filters, effluent testing, disposal fee, etc.) for treating, discharging, or disposing of known Contaminated Groundwater in the Contract Price.

4.4.1.2.3 Hazardous Waste, Lamps and Ballasts

The State of Wisconsin has a Mandatory hazardous waste, lamp, and ballast disposal contract. All hazardous waste, lamps, and ballasts must be disposed of using this contract. Contact the REC and the Hazardous Materials Specialist to coordinate this disposal.

4.4.1.3 Unknown Hazardous Materials

In the event on-Site observations during construction indicate the presence of Hazardous Materials (such as solid waste, including demolition debris, containers, or free product) or contaminated soils that have not been identified previously, immediately stop Work and notify the REC, and follow the requirements in STSP 107.24 and CMM 130.2.

4.4.1.4 Uninvestigated Areas of Contaminated Materials

If excavation is proposed by the Contractor outside the Preliminary Design areas/features identified as sites of hazardous materials concerns in the Phase 1 HMA or not included within the Phase 1HMA, notify the REC. REC and the WisDOT environmental consultant will prepare a work plan following FDM Chapter 21. The findings will be made available to the Project team and the list of contaminated sites updated for Project use.

4.4.2 General Design Requirements

4.4.2.1 Section 106 of the National Historic Preservation Act

When there are changes proposed to the roadway footprint, and therefore possible changes to the area of potential effect (APE), the Project Team should review the DT1635, Section IX Project Decision:

- If the project decision is "No historic properties (historical or archaeological) in the APE" and the APE for the Project has remained the same, no additional coordination is required

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- If the Project decision is “No historic properties (historical or archaeological) affected” and the change in design is close to the historic property, reach out to cultural resource consultation for the Project, the REC, and WisDOT Cultural Resources Team (CRT)
- If the Project decision is “Historic properties (historical and/or archaeological) may be affected by the project,” stop and contact the cultural resource consultant for the Project, the REC, and WisDOT CRT

It is the responsibility of the Consultant to hire a historian or archaeologist as needed to investigate areas where changes to the Project APE are proposed.

4.4.2.2 Physical Impacts on Water Resources

Avoid and minimize impacts to the wetlands described in Exhibit 4-A (*Environmental Document*) and other waters of the State. “Impacts” include the permanent or temporary placement of fill, excavation, or other activities.

If permit amendments and mitigation are required for wetland impacts exceeding those identified in permits, immediately contact the WisDOT Project Manager and REC as described in Section 4.2.4 (*Erosion and Sedimentation*). Comply with applicable permitting and regulatory requirements for any dewatering activities associated with Project construction. Do not proceed with construction in designated areas until a permit for that area (amended or otherwise) is obtained.

4.4.2.3 Water-Related Land Use Management

Encroachment in a floodplain is prohibited in the floodway and restricted based on fill in the flood fringe. As indicated in the WisDOT/DNR Cooperative Agreement and its 1988 attachment related to Waterway Crossings and other Floodplain Encroachments, WisDOT will evaluate impacts from all proposed construction affecting mapped floodplains and will carry out appropriate coordination with the local floodplain zoning authority.

Consult with the REC for help determining environmental coordination necessary for your specific project. It may vary depending on the scale and type of encroachment.

Contact the WisDOT Project Manager for coordination with a Bureau of Structures Hydraulic Engineer and/or the Statewide Drainage Engineers in the Bureau of Project Development Roadway Standards Unit to determine appropriate Hydrology and Hydraulic Analysis for the Project. Impacts from roadways, non-numbered culverts (no B or C letter) are to be coordinated with the Statewide Drainage Engineers.

4.4.2.4 Erosion and Sedimentation

Reference Section 12.2.3.1 for information regarding the submittal of the 401 Water Quality Certification and Transportation Construction General Permit (TCGP) Notice of Intent (NOI) as part of the RFC plans.

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Submit the Erosion Control Implementation Plan (ECIP) and ECIP Amendments for the Project, including for each structure, borrow site, waste site, and other temporary support activities to the DOT Project Oversight Team, the DOT SWEC, and the DNR Liaison, as described in Section 14.3.3.2.2.

4.4.2.5 Water Quality

Meet water quality permit requirements in accordance with Section 12 (*Drainage*) requirements.

4.4.2.6 Traffic Noise

If changes in horizontal or vertical alignment or modifications to siting of modeled barrier locations are proposed during final design to the alternative selected in the final environmental document, the Design-Builder must coordinate with the WisDOT Project Manager and REC to determine if:

- Revision to the noise analysis completed for the final environmental document is required
- A requirement for conducting a noise analysis per FDM Procedure 23-10-1.1, Type I Projects is triggered based on the changes if a noise analysis was not previous required

If a reasonable and feasible noise barrier(s) was identified during the environmental documentation process, the Design-Builder is responsible for delivering the public involvement process as described in Book 2, Section 3.5.3 (*Likely To Be Incorporated Into the Project*).

The WisDOT Project Manager will provide the Design-Builder with the final determination regarding whether the noise barrier(s) will be incorporated into the Project following completion of the public involvement process.

The Design-Builder will be responsible for determining if the barrier(s) identified remain reasonable and feasible through final design.

If the Design-Build process results in any barrier(s) previously identified as reasonable and feasible through the environmental documentation process being eliminated from consideration, the Design-Builder is responsible for working with the Project Manager, REC, and Central Office Noise Engineer or Specialist to develop and deliver a public involvement process to inform the public of this determination.

4.4.3 Reports and Plans

4.4.3.1 Hazardous Materials Management Plan

Prepare and submit a Hazardous Materials Management Plan to WisDOT's REC that documents at least the following:

- Design modifications made to avoid or minimize the disturbance of contaminated soils and groundwater or the rationale for not being able to do so

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- Proposed staging area locations and precautions to protect Site soils and groundwater, if the Site has known contamination and/or potential hazardous material concerns per the Phase 1 HMA
- Areas where the ground disturbance is:
  - Significantly different from the Preliminary Design Drawings in a way that will have a larger impact on the existing ground (for example, placing a pond, roadway subgrade excavation, or wall foundation in a new location)
  - located either within or 100 feet adjacent to properties denoted as sites of potential hazardous materials concern in the Phase 1 HMA
  - Not located within an area that was already investigated in the existing Phase 2 assessment

For any areas that meet the above requirements, develop an investigation plan (as part of the Hazardous Materials Plan) to check for contaminants in these areas following the protocols for Phase 2 investigations. The investigation plan must include:

- The proposed soil disturbance locations and their vertical and horizontal extents
- Estimated quantities of contaminated soil, groundwater, and/or sediment to be generated during construction, proposed management methods, and associated disposal or treatment costs
- Necessary landfill approvals for anticipated disposal methods and landfill requirements for additional sampling
- Proposed environmental subcontractor performing the Work
- Proposed contaminated soil stockpile location(s), treatment, and weekly stockpile inspection/tracking sheets
- Verification that pre-construction rates of groundwater flow and transfer in contaminated areas are not impacted by design features. Document the proposed methodology that will be used to minimize impacts to identified groundwater contamination plumes during dewatering activities
  - Impacts include:
    - Moving horizontally Contaminated Groundwater into less contaminated areas
    - Moving Contaminated Groundwater vertically throughout the aquifer
- Minimization strategies such as:
  - Slower pumping rates
  - Dewatering during historically drier times of year
  - Limiting the cone of depression

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- Anticipated groundwater dewatering discharge rates, quantities, permits, and discharge points. Discharge points must be permitted for receiving Contaminated Groundwater. Remedial Action Operations Permits for contaminated groundwater are in addition to the General Stormwater Wisconsin Pollutant Discharge Elimination System (WPDES) Permit for Construction Activity. WDNR approval of Industrial Treatment System is required if treatment of the contaminated groundwater is necessary to meet the WPDES discharge permit requirements
- Notification and/or permits for dredging material
- Anticipated groundwater and/or surface water containerization methods
- Anticipated groundwater treatment methods, if deemed necessary by the permitting authority. WDNR approval of Industrial Treatment System is required if treatment of the contaminated groundwater is necessary to meet the WPDES discharge permit requirements
- Design for a temporary, bermed, impermeable, and tear-resistant containment area for saturated materials generated from drilling and excavations through contaminated areas to drain excess water prior to disposal of soil. Excess water generated will need to be treated as contaminated and managed appropriately

Execute the investigation plan and complete the investigations.

4.4.3.2 Modifications to the Hazardous Materials Management Plan

Prepare and submit to the REC a Hazardous Materials Management Plan addendum when Project staging and/or changes to the design used in the original Contaminated Materials Management Plan occur.

Within the addendum, identify areas where the new ground disturbance will satisfy the conditions for investigation listed in Section 4.4.3.1 (*Hazardous Materials Management Plan*).

For any such areas, develop an investigation plan to check for contaminants in these areas following the protocols for Phase 2/2.5 investigations for inclusion, then execute the plan and complete the investigations.

4.4.3.3 Hazardous Materials Investigation Field Work and Reporting

Investigations, sampling, and analysis will be completed by WisDOT prior to soil disturbance.

If field screening by the Contractor identifies new contamination areas, stop work and notify the REC immediately for possible additional delineation and related actions by the WisDOT Environmental Consultant.

4.4.3.4 Asbestos-Containing Materials Removal from Structures

Comply with FDM Section 25-1 (*Asbestos*).

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4.4.3.5 Hazardous Materials Management Implementation Summary

Work with the WisDOT Environmental Consultant in documenting the following for each contaminated area(s) or waste stream(s) (organized by contaminated area or waste stream):

- Quantities of Hazardous Materials or Regulated Materials disposed
  - Waste profile forms
  - Written landfill approvals and acceptance
  - Electronic copies of manifests and landfill scale tickets
  - Waste profile forms
- Landfill disposal or recycling of Regulated Materials
  - Waste profile forms
  - Written landfill approvals and acceptance
  - Copies of manifests and landfill scale tickets and recycling certificates on a daily basis during related operations

4.4.3.6 Spills Management

Provide electronic copies of disposal and cleanup information for purposes of documenting proper spill cleanup. Submittal of spill response reports will be included for any spills that occurred during the course of the Work to the WisDOT Project Manager, who will forward to the WisDOT HazMat Unit.

4.4.3.7 Schedule

Under the direction of the REC, prepare a schedule of activities for environmental mitigation related to Project phasing, and update the schedule throughout the Project. Provide the schedule to the REC weekly during the Project.

4.4.3.8 Monitoring Reports

4.4.3.8.1 Environmental Monitoring Reports

4.4.3.8.2 Weekly Environmental Commitment Monitoring Reports

The CECO will provide a weekly environmental commitment monitoring report to the WisDOT Project Manager and REC. At a minimum, the report will include the status of implementation of each commitment and permit requirement, lessons learned, proposed actions to communicate lessons learned, and areas needing improvement. The report is to be shared with the Contractor's staff and relevant task leads each week. The report may be organized like sample Table 4-2 to simplify monitoring. Any issues with implementing environmental commitments will be immediately reported to the WisDOT Project Manager and REC, as described in Section 4.3.1.1 (*Environmental Re-evaluation Requirements*).

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Table 4-2: Environmental Commitment Monitoring

Commitment:			
Status Last Week	**Status This Week**	**Lessons Learned**	**Issues to Report**
Commitment:			
Status Last Week	**Status This Week**	**Lessons Learned**	**Issues to Report**
Commitment:			
Status Last Week	**Status This Week**	**Lessons Learned**	**Issues to Report**

4.4.3.9 Site Management Plan

Under direction of the CECO, prepare Site Management Plan(s) as required by the ECQP found in Section 5 (*Quality Manual*). At the direction of the WisDOT Project Manager, additional Site-specific management plans may be required for Site-specific activities. The Quality Manual outlines the process for design, review, and Acceptance of these Site Management Plans.

4.5 Construction Requirements

4.5.1 General

4.5.2 Construction Criteria

4.5.2.1 Fish, Wildlife, and Ecologically Sensitive Resources

Implement the WDNR's Best Management Practices for protection of sites of ecological significance and comply with all environmental commitments and permit conditions to protect ecological resources.

See environmental commitments and special provisions for additional guidance on protecting sensitive resources.

4.5.2.2 Noise

Comply with applicable noise requirements. These may be found in the Reference Information Documents, special provisions, environmental document, and environmental commitments.

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Measures to limit noise-generating activities, such as pavement breaking, should be implemented where feasible.

4.5.2.3 Nearby Resources

4.5.2.3.1 Cultural Resources

Cultural resources have been identified in the Project area as described in the Project environmental document. WisDOT, FHWA, and State Historic Preservation Office (SHPO) and/or Tribal Historic Preservation Office (THPO) have signed an Agreement pursuant to Section 106 of the National Historic Preservation Act (NHPA). The Agreement is provided in Exhibit 4-E. Comply with all stipulations in Exhibit 4-E, including providing protection using buffers and visual barriers to select identified cultural resources during construction in consultation with the WisDOT CRT, who will coordinate with SHPO as necessary. All efforts to comply with the provisions of the agreement and any associated environmental commitments or special provisions must be documented in the Environmental Commitment Monitoring Report described in Section 4.4.3.8.2.

In the case of a proposed ground disturbance, follow all provisions of CMM 158 (Exhibit 4-F). For all cultural resources Work, WisDOT is the Contractor's primary point of contact, and WisDOT will coordinate, as necessary, with the Wisconsin State Historic Preservation Office.

If previously unidentified cultural resources, including human remains, are encountered during construction, construction activities within 100 feet of the discovery must stop, and the Contractor must notify the WisDOT Project Manager and REC immediately.

When an Archaeological Field Survey is required, as described in Section 158.2.2. of the WisDOT Construction and Materials Manual (Exhibit 4-F), allow 2 weeks for survey scheduling.

4.5.2.3.2 Parks, Trails, and Recreation Areas

4.5.3 Environmental Notification Contact List

Use the REC as the first point of contact for all environmental issues. The REC will be responsible for notifying the appropriate environmental contacts from the contact list. Under direction of the CECO, provide the following to WisDOT:

- All contact persons representing the Contractor
- The chain of contact for Contractor personnel
- For each contact, the person's name, agency or corporate affiliation, address, e-mail address, and cellular and office telephone numbers.

Specify, at a minimum, the appropriate Contractor contact person(s) for reporting and notification of the following events:

- All spills (non-exempt or unpermitted release of a hazardous substance to the environment)

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- Discharge to groundwater
- Discovery of any of the following:
  - Active bird nests (with eggs or young) or any evidence of species covered under the Migratory Bird Treaty Act or any Federal or State protection
  - Roosting evidence of the Northern Long Eared Bat
  - Cultural or historic artifacts
  - Human bones or remains
  - Wildlife injured during construction activities
  - Materials such as contaminated soils, asbestos-containing materials, solid wastes, Contaminated Groundwater, and other Regulated Materials Disturbance of any threatened or endangered species or its habitat
  - All inspections by WDNR
  - Environmental inspections by other agencies
  - Illicit discharges of non-stormwater or sediment-laden stormwater leaving or entering the Site
- Occurrence of Project activities outside the planned final right-of-way
- Violation of permits and regulations listed in Table 4-1
- Any environmental issue not covered in items listed above

4.6 Deliverables

Table 4-3 through Table 4-6, which list Deliverables identified in this Section 4, are not intended to be exhaustive. It is the Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

Provide an estimated schedule of submittals and notify WisDOT of changes to the schedule as soon as practicable. Submit all documents under the direction of the CECO to the REC.

Table 4-3: Non-exhaustive Deliverables Required Prior to NTP1

Name	Acceptance or Approval	Section Reference
Designation of CECO	Approval	
Environmental Protection Training Program and training schedule	Acceptance	
Spill Containment Plan and notification list	Acceptance	

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Table 4-4: Non-exhaustive Deliverables Required Prior to NTP2

Name	Acceptance or Approval	Section Reference
Health and Safety Plan for work with Contaminated Materials and Regulated Materials	Acceptance	
List of wells within the Project limits and recommendations for wells to seal	Acceptance	
Contaminated and Regulated Materials Management Plan and Addendum	Approval	
Contaminated and Regulated Materials Investigation Work Plan	Approval	
Environmental Notification Contact List	Acceptance	
Schedule of anticipated environmental mitigation	Acceptance	
Completed additional permit applications and permits as issued	Acceptance	
Wetland Replacement Plan, if required	Acceptance	
Cultural Resources Report, if required	Acceptance	

WisDOT review periods for the following will extend up to 14 Days unless otherwise noted.

Table 4-5: Non-exhaustive Deliverables Required During Construction

Name	Acceptance or Approval	Section Reference
Demolition Notification to WDNR	Acceptance	
Weekly and Monthly environmental monitoring reports	Acceptance	
Permit monitoring and reporting requirements as required by permits, as needed, for Acceptance	Acceptance	
Groundwater treatment system plan, if necessary	Acceptance	

Table 4-6: Non-exhaustive Deliverables Required Prior to Final Acceptance

Name	Acceptance or Approval	Section Reference
Permit documentation	Acceptance	
WNDR WPDES NOT (Notice of Termination)	Acceptance	
Well location report	Acceptance	
Well and boring sealing records	Acceptance	
Spill response reports	Acceptance	
Field memoranda, data collection sheets, and inspection logs	Acceptance	
All Regular Environmental Monitoring Reports	Acceptance	
Final summaries of Contaminated Materials management	Acceptance	
Final Wetland Impact and Mitigation Plan	Acceptance	

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EXHIBITS

All exhibits are provided as electronic files.

Exhibit 4-A Environmental Document

Exhibit 4-B Permits

Exhibit 4-C Hazardous Materials Provisions

Exhibit 4-D Design Build WPDES MOU

Exhibit 4-E Cultural Resources / Section 106 Memorandum of Agreement

Exhibit 4-F WisDOT Construction and Materials Manual Section 158: Cultural Resources

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5 Quality Management

5.1 General

Section 5 describes the requirements of Quality Management, including the quality management system, development of a Quality Manual, design reviews, the Department submittal review timeframes, RFC Documents, and As-Built Documents.

5.2 Quality Approach

5.2.1 Design-Builder Responsibility

Develop, implement, and maintain a quality management system (QMS) meeting the requirements of Section 5. Ensure that the QMS meets the following requirements:

- Encompasses design, construction, and document management aspects of the Project
- Includes development of a Quality Manual (QM) describing the Design-Builder's quality policy, quality objectives, design and construction quality plans, quality procedures, Work instructions, and records
- Integrates the quality goals of both the design and construction elements of the Project
- Assigns the responsibilities for specific quality management functions

Perform Quality Control and Quality Assurance activities for the design of the Project in accordance with the policies and procedures defined in the QM. Determine submission of Design Documents to agencies other than the Department and include in the QM. Take responsibility for Work associated with review and comment of the design by outside agencies. Share with the Department copies of all correspondence with outside agencies and any of their design review comments.

Ensure that materials and the constructed Work meet Contract requirements. Perform tests and inspections in accordance with the policies and procedures defined in the QM.

Maintain a document control system to store and record all documents generated under the Contract. Enter documentation of quality activities, tests, and inspections in the document control system. The Design-Builder is required to use the Department's supplied Program Management Information System website as their document control system.

Provide documents to the Department in a format that allows any changes to be readily apparent and traceable (e.g., documents using the redline/strikeout method).

5.2.2 The Department Role

The Department will perform design auditing and acceptance of Released for Construction Documents, construction quality acceptance testing and inspection (including acceptance at

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Critical Path points) to verify that the Work meets Contract requirements, independent assurance sampling and testing, and auditing of the Design-Builder's management system.

Auditing will entail the collection and documentation of objective evidence to verify whether Contract requirements have been met. The results of auditing will be documented on standardized audit report forms with copies provided to the Design-Builder. Non-conformances will be communicated and tracked in separate reports. The audit results will also be recorded in a database, and regular summary and status reports will be provided to the Design-Builder. The timing, frequency, and depth of auditing will be at the Department's discretion.

At any time as deemed necessary by the Department, the Department verification staff may perform inspections or take samples for further investigation of possible non-conforming Work.

If the Department determines that the Design-Builder is not providing adequate Quality Management procedures, the Design-Builder's Quality Management staff must be on site at all times to perform audits, inspections, and other quality activities until the Design-Builder meets the QM requirements. The Department may also seek non-recoverable reimbursement for the Department and other party additional costs and impacts per Book 1, Section 5.7.2.

5.2.3 Withholding of Payment and Work Suspension

If there is evidence that the Design-Builder's quality procedures are not adequate (as evidenced by the Department's verification reviews or problems during design or construction), the Department may, at its sole discretion, withhold payment for design or construction until sufficient quality procedures are in place. If construction is in progress, the Department may suspend ongoing Work represented by the deficient quality procedures, and require correction of design or construction defects. The engineer may suspend the Work in writing for any reason as specified in Book 1 for engineer-ordered suspension of payment or time extension due to a suspension of Work.

The Department and the Design-Builder will jointly evaluate each Critical Path Activity. For each Critical Path Activity designated as not meeting the industry standard and therefore not acceptable by the Department, the Design-Builder will be assessed a reduction in payment of $750 for failure of Quality Management. Each Critical Path Activity initially receiving a non-acceptable designation will require an additional evaluation. Any subsequent non-acceptable evaluation by the Department will be assessed an additional $750 reduction in payment.

Prepare and assess a Non-Conformance Report (NCR) for Work defined as non-conforming Work by the Contract using the process in the Quality Manual. The Department has the right to prepare and assess an NCR to the Design-Builder for the Design-Builder's required Work if the Design-Builder promptly fails to assign itself an NCR. For each NCR assessed by the Department, the Design-Builder will be assessed a reduction in payment of $750 for failure of Quality Management.

The reductions in payment identified above are in addition to other reductions as applicable and identified in the Contract.

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5.3 Administrative Requirements

5.3.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to quality management, the order of precedence is set forth below unless otherwise specified:

- WisDOT *Facilities Development Manual* (FDM)
- WisDOT *Bridge Manual*
- WisDOT Bridge Manual Standard Drawings
- WisDOT *Traffic Engineering, Operations and Safety Manual* (TEOpS)
- WisDOT *Traffic Signal Design Manual* (TSDM)
- *WisDOT Construction and Materials Manual* (CMM)
- Remaining standards set forth in Book 3

5.3.2 Meeting Requirements

Coordinate and facilitate meetings throughout the duration of the Project as defined in the Contract Documents. The Department reserves the right to request additional meetings beyond those identified in the Contract Documents. Prepare and distribute typed minutes from Project-related meetings regardless of who initiates the meeting.

- Project Design-Build Kickoff Meeting. Schedule, conduct, and prepare and distribute the minutes and notes of the meeting. The meeting is to discuss schedule, coordination (internal and external), issue resolution, quality management, communications, business impacts, traffic management, and other issues.
- Preconstruction Meeting. Schedule, conduct, and prepare and distribute the meeting minutes and notes of the meeting. Ensure the Department, Prime Design-Builder and Subcontractors, Utility Companies, Railroad representatives, Project Advisory Committee (PAC), Project personnel, and representatives from any affected local unit of government attend to discuss all aspects of the construction. Discuss design and construction commitments made in the Design-Builder's Proposal, along with a plan for implementation.
- Weekly Project Meeting. Design-Build PM, Design-Build Construction Manager, Public Information Liaison, Design-Builder quality personnel, and other appropriate staff identified as needed by the Department will attend weekly Project meetings. Schedule and conduct the meeting, and prepare and distribute the meeting minutes and notes of the meeting.
- Pre-Activity Meeting. Schedule and conduct the meeting, and prepare and distribute minutes and notes of the meeting. Meeting requirements must be set forth in the Design-Builder's Quality Manual. Meeting attendees must include the Design-Build PM, Design-

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Build Construction Manager, Design-Builder's quality staff, contractors, or subcontractors involved in the Work, and other appropriate staff as identified by the Department.

5.3.3 Equipment/Software

Use the document management system for submitting RFC plans, logging and tracking construction inspection and testing data, and for design comment logging, tracking, and resolution. The Department will provide access to the Design-Builder.

5.3.4 Permits/Authorizations

TBD

5.3.5 Design Requirements

Structural designers must be on the Bureau of Structures (BOS) Eligible Structure Consultants list, and the BOS must have on file an electronic copy of its current Quality Assurance/Quality Control (QA/QC) plan and procedures. See WisDOT Bridge Manual Section 6.5 for QA/QC plan requirements. QA/QC plans must be reviewed and updated with a frequency of no more than 5 years.

5.4 Quality Manual

5.4.1 General

Provide a QM that sets forth comprehensive quality processes and procedures for design, construction, and documentation.

The QM must:

- Be approved and endorsed by the Design-Builder's executive management committee
- Be in effect until all requirements of the Contract have been fulfilled and the Project is accepted and through the warranty period
- Describe the Quality Manager's accountability for ensuring the effective implementation and maintenance of the QM
- Include an organizational chart including names, telephone numbers, current certifications, and roles and responsibilities of quality control personnel
- Require that all Design-Builder personnel be responsible for reporting quality problems
- Describe all quality control and quality assurance resources, such as design reviewers, inspectors, and testers that the Design-Builder will use
- Depict how the Design-Builder's design technical experts are incorporated into the construction phase of the Project

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- Include, at a minimum, the design, construction, and document management systems described subsequently within Section 5.4
- Include a process for disseminating quality control and corrective action information to appropriate persons. Include a list of recipients, the communication means used, and action time frames.
- Describe how the Design-Builder plans to deal with discovered non-conformances, tracking non-conformances, resolving non-conformances, and preventing similar non-conformances from occurring on future Work within the Project
- Changes in Quality personnel will require notification in writing. The QM must be revised to reflect those staff changes.

Revise and resubmit the QM and its implementation when either the Design-Builder or the Department identifies a systemic problem.

The precedence of the documents describing the QM is (1) quality policy (for the entire quality management system), (2) quality objectives, (3) policies (for each element of the QM), (4) procedures, and (5) Work instructions.

Ensure that written procedures clearly describe the purpose of the process, overview of the process, responsibilities, steps of the process, and records resulting from the process.

5.4.2 Quality Manual Template

To aid the Design-Builder with development of the QM for the Project, the Department has developed a QM Template (Exhibit 5-A) consisting of five volumes:

- Volume I: Quality Management Plan
- Volume II: Design Quality Management Plan
- Volume III: Construction Quality Plan
- Volume IV: Document Management Plan
- Volume V: Environmental Compliance

These volumes include quality processes and procedures the Department requires in the Design-Builder's final QM for the Project. These documents may not include all processes and procedures required for the Project. Review, modify, and enhance these documents as necessary to provide an overall comprehensive QM for the Project that is suitable for Design-Builder processes and personnel. Certain areas of the QM Template's documents have been specifically identified for modification via highlighted text or data fields. Other areas to be covered include:

- Unique or otherwise non-standard designs
- Unique or otherwise non-standard construction techniques

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- Processes added to ensure appropriate performance through the Project warranty periods

The Design-Builder may provide a QM developed independently, unless otherwise stated in Section 5.4.6, but it must cover all the topics contained in Volumes I through V of the Department's QM Template and meet all requirements of the Contract. This QM is subject to the approval process detailed in Section 5.5.2. Identify any revisions through highlighting and/or tracked changes.

5.4.3 Management Review

Comply with the QM Template (Exhibit 5-A) for minimum management review requirements.

5.4.4 Design

Ensure that design (including design by Subcontractors) meets the requirements of the QM and the Contract Documents.

Prepare the Design Quality Management Plan that, at a minimum:

- Defines sound design QA/QC review processes
- Describes how all design criteria, Contract requirements, and other design inputs are defined, reviewed, and approved
- Describes the design and verification activities separately
- Describes how the design team schedules the design efforts, including design reviews, verification and checking stages, and issue dates of design deliverables
- Includes details as to the level of involvement of the Department, local, and regulatory agencies in the design development and design review process. The Design-Builder is encouraged to involve the Department in all design development processes, including independent technical reviews and constructability reviews.
- Describes how the security of documents will be controlled during the Project
- Describes the coordination of the design with construction
- Describes how the Design-Builder will maintain an accessible, centrally controlled manual, database, or list that contains all relevant design inputs or references to design inputs to be used by design personnel to incorporate into the design
- Defines the design outputs (i.e., the specific plans and specifications) to be produced
- Includes quality measures and encourages continuous improvement of the design deliverable products
- Describes how changes to design are identified, reviewed, and approved by authorized personnel prior to their implementation
- Describes the method of communicating changes or revisions made in the field

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5.4.5 Construction

Prepare a Construction Quality Plan section that provides quality measures and encourages improvement of the construction phase of the Project. Include all proposed Design-Builder QA/QC activities. Provide a Construction Quality Plan that:

- Describes the incoming, in-process, and final inspections and tests to be undertaken
- Identifies pre-activity meetings
- Identifies Critical Path Activities for which Work is formally accepted by independent quality personnel and the Department prior to proceeding to the next stage of the Work
- Provides Critical Path Activity Managers to ensure that all required tests and inspections have been performed leading up to Critical Path Activities, and that the test and inspection results meet Contract requirements
- Is approved by the Quality Manager

5.4.5.1 Schedule of Materials Control

Chapter 8, Section 50 of the CMM outlines minimum sampling, testing, and inspection requirements. The current edition of CMM 8-50 can be found at WisDOT's website: https://wisconsindot.gov/rdwy/cmm/cm-08-50.pdf.

Both the Design-Builder and the Department designate a Project Materials Coordinator for the Project. Project Materials Coordinators must be Highway Technician Certification Program (HTCP) certified as having completed the materials coordinator training prior to assuming the responsibilities. The Design-Builder's Project Materials Coordinator responsibilities include the following:

- Ensuring the Design-Builder's SMC requirements are met
- Ensuring that Design-Builder's personnel have obtained and maintained relevant HTCP certifications
- Communicating contract sampling and testing requirements to subcontractors at all tiers
- Documenting test results
- Ensuring proper sampling processes and procedures are used by all quality staff
- Reviewing and tracking all quality training requirements
- Performing annual materials certification of the Design-Builder's tests
- Ensuring proper completion of all sample cards and all necessary tests on the sampled Materials prior to incorporation into the Work
- Reporting out-of-specification test results to The Department as soon as the information is available
- Coordinating the SMC requirements with all Suppliers and Subcontractors

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Ensure material tests reference the appropriate activity ID on the Design-Builder's CPM schedule, or a location description and station range.

Complete an annual materials certification of tests and material inspections. Input this information and testing and inspection records (including records from Suppliers and Subcontractors) electronically into the document control system with reference to the activity ID in the Schedule or applicable station range.

5.4.5.2 Quantities and Production Tracking

Provide testable quantities with each Released for Construction submittal. Provide the quantities in the units indicated in the SMC and use as the basis of testing rates by the Design-Builder's quality staff and the Department.

During performance of the Project, collect and enter into the document control system daily construction-related activities (diaries) that document weather conditions, Work performed, and impacts to Work (conditions that impact the schedule). Tie entries to activities listed on the Project schedule and enter daily.

5.4.5.2.1 Review and Disposition of Non-Conforming Product and/or Work

Ensure that non-conformances identified during the design verification and checking, or construction testing, are recorded, along with inspection activities. Resolve all non-conformances, including those of Subcontractors or Suppliers. Within 5 Working Days of the identification of a design-related non-conformance by the Department, propose a resolution for the Department's acceptance or approval, consistent with the Department's original authorization of the Work. Following acceptance or approval of the proposed resolution by the Department, as applicable, notify the Department 24 hours prior to implementing the proposed solution so that the Department may witness the implementation (should the Department so choose).

5.4.5.2.2 Corrective and Preventive Action

The QM describes the corrective and preventive actions the Design-Builder will take on the identification of actual or potential major and systemic non-conformances, identified internally or by the Department. Review the cause of major and systemic non-conformances and develop corrective action to prevent recurrence. Document proposed corrective action in a format and medium acceptable to the Department. Advise the Department when the corrective action has been implemented so the Department may verify the implementation (should the Department so choose). Within 5 Working Days of the identification of a major or systemic problem by either Design-Builder or the Department staff, propose to the Department, for approval, a corrective or preventive action to prevent the recurrence of the problem. Update the QMS to incorporate the corrective action.

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5.4.6 Environmental Compliance

Use the Environmental Compliance Quality Plan Template (Exhibit 5-A) and comply with the minimum requirements. No change will be allowed to the Environmental Compliance Quality Plan, unless otherwise approved by the Department.

5.4.7 Investigations/Supplemental Work

5.4.7.1 Design Coordination

Prior to submitting Plans for Department acceptance, participate in over-the-shoulder reviews, in-progress review workshops, and 30 percent and 60 percent plan reviews as described below.

5.4.7.1.1 Over-the-Shoulder Reviews

Over-the-shoulder reviews are informal examinations of Design Documents by the Department during the Project design process. Over-the-shoulder reviews will mainly assess whether the requirements and design criteria of the Contract Documents are being followed, and whether the Design-Builder's design Quality Management Plan activities are being undertaken in accordance with the approved QM.

Each design package must have at least one over-the-shoulder review and meeting, whether initiated by the Department or the Design-Builder, unless waived by the Department. The reviews may, at the Department's discretion, include review of design drawings, electronic files, calculations, reports, specifications, geotechnical data, progress prints, computer images, draft documents, draft specifications and reports, other Design Documents, and any other relevant design information as requested by the Department.

It is the intent of these reviews to check for concept, level of detail, design criteria, and fatal flaws. It is the Design-Builder's responsibility to confirm conformance with the Contract requirements. These reviews will not routinely include detailed calculation or drawing reviews, although the Department retains the right to perform detailed reviews of any item at any time. If mutually agreed upon between the parties, for specific review items, the over-the-shoulder review may consist of an exchange of electronic files between the Design-Builder's designer and the Department.

Schedule over-the-shoulder reviews with the Department during the development of each design package, prior to issuance of Released for Construction Documents. These are simply reviews of the design as it progresses and opportunities for the Department to provide comments and feedback on the design.

Comments provided by the Department during the over-the-shoulder review process are non-binding.

5.4.7.1.2 In-Progress Design Reviews

Throughout the design process, the Design-Builder or the Department may request (with a minimum of 5 Working Days' notice) in-progress design reviews to review and provide

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comments to assist the Design-Builder or its designer(s) in resolving design questions and issues.

At a minimum of 5 Working Days prior to each in-progress design review, assemble and submit drawings or other applicable documents to be reviewed to the Department for its information and review.

Maintain a written record of all in-progress design reviews, including the following:

- Description of the specific items covered and discussed
- Identification of discrepancies and comments and a report on corrective actions (both those taken and those planned)
- Identification of follow-up action items, due dates, the party responsible for action items requiring resolution, and deadlines for resolution

In-progress design reviews will be documented in the document control system.

5.4.7.1.3 30 Percent and 60 Percent Plan Reviews

Reviews of 30 percent and 60 percent plans will be conducted for each design package as per the Department's FDM 15-1-4. The Design-Builder will coordinate with the Department in determining the extent of the review period based on the complexity of each design package.

Reviews of 30 percent and 60 percent plans will be documented in the document control system.

5.4.8 Design Criteria

5.4.8.1 Project-Specific Quality Requirements

TBD

5.4.9 Reports/Plans

5.4.9.1 Released for Construction Submittals and Acceptance

5.4.9.1.1 Released for Construction Documents

Except as otherwise specified, no construction Work is allowed without RFC Documents. The timing of submission of RFC Documents is indicated in the Project schedules. Ensure all Work, including modifications to the Work, is designed under the authority of and signed by a Wisconsin-licensed Professional Engineer. A licensed Professional Engineer must sign each RFC title sheet and other designated plan sheets. Cross-section sheets do not require a signature.

RFC Documents constitute the documents issued for the purposes of construction. Provide RFC packages that include the following at a minimum, unless otherwise approved by the Department:

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- Cover sheet with submittal description, schedule activity identification, and index of documents with page numbers
- Design Quality Manager Certification in accordance with the QM
- Design Plans
- Design calculations
- Design reports
- Specifications and special provisions
- Governmental, Utility Owner, and Railroad approvals
- Material quantities for testing and inspection
- Environmental Management Plan (if the RFC Document affects the Commitments in ways that have not already been accepted)

Other electronic files included in RFC submittals include the following:

- Modeling software files used for design
- Civil 3D files, including all drawings and data files used to create the RFC Documents

Ensure RFC Documents meet the following criteria:

- For bridges, meet all requirements of the Preliminary Bridge Plans.
- Prepare Plans that are similar in appearance and content to the WisDOT FDM Sample Plan Improvement Project and in accordance with Section 5.4.9.1.2 below. Variations are anticipated as a result of Design-Build delivery. Meet with the Department to obtain approval of any variations in Plan content and format.
- Provide a table of Standard Plans and Standard Plates used in each RFC Plan submittal. Label the referenced Standard Plan or Standard Plate on each RFC sheet containing the corresponding Standard Plan or Standard Plate Work.
- Provide special provisions selected from Book 3, Section 5, and modify them as necessary for the Project.
- Ensure that all special provisions, Working Drawings described in Section 5.4.11.1 (Working Drawings), and other items necessary to construct the Work are submitted as RFC Documents. If the Design-Builder requests the Department's approval to use methods or materials that are not the Department standards, such requests must include comprehensive specifications and provisions associated with the proposed non-standard methods or materials.
- Prepare all bridge and structure drawings in accordance with the Department bridge design standard practices using the Department bridge insert sheets and cell libraries.

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- Prepare all roadway and survey drawings in accordance with the Department's road design standard practices.
- Ensure that Civil 3D is used for design, unless otherwise specified by the Department.
- Ensure that all designs and drawings are in English units.
- Include the limits of excavation for all excavation Work.
- Include quantities in all RFC Documents for all items that require inspection or testing in accordance with the SMC.
- Submit structure calculations, load rating summary form, structure inventory forms, and slab/prestress input files as applicable in accordance with the As-Built Documents with RFC Documents with each design package.

For structure plans, prepare and include "Bill of Bars" tables for structure components in accordance with the Department's bridge design standard practices, except that the quantity of bars for each bar mark is not required to be shown. It is not necessary to conform to "Standard Specifications Bid Items" requirements or to provide "Total Estimated Quantities" tables in the plans.

Obtain the Department's signature for all RFC Documents prior to release of those documents for construction.

5.4.9.1.2 Released for Construction Plans

Produce plans and specifications in a format that aids and facilitates design review by the Department. Develop plans in accordance with the Department's CADD Standards, including the following at a minimum:

- Stationing, including the following:
  - Indicate begin and end of Project stations
  - Indicate begin and end of construction stations.
  - At the beginning of all proposed alignments, the alignment stationing matches the Department's in-place alignment stationing, without the use of station equations.
  - At the end of all proposed alignments, the alignment stationing matches the Department's in-place alignment stationing, through use of station equations.
  - On divided roadways with separate alignments, use station equations to equate stationing of each alignment at the beginning of every tangent segment (i.e., identical stationing for northbound and southbound alignments, eastbound and westbound alignments).
- Roadways labeled
- Scale, north arrow, legend

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- References to other sheets (e.g., see Sheet No. 00)
- Text oriented to be viewed from right side of the sheet or from the bottom of the sheet
- All text is legible with no text overlapping or lines going through text
- “Drawn by:” and “Checked by:” initials included
- Sheet title in lower right
- State Project number(s) with the state highway designation (STH) at the lower right
- File name, plot name, and date and time of plot at lower left

5.4.9.1.3 Released for Construction ITS Plans

Prepare plans that are similar in appearance and content to the Department ITS Sample Plans. These are required for permanent and temporary construction. Variations are anticipated as a result of Design-Build delivery. Meet with the Department to obtain approval of any variations in plan content and format. Provide Plans that, at a minimum, include the following:

- Title sheet
- Legend of symbols
- Existing components with utilities
- Abandon and removal plans
- Plans depicting proposed infrastructure indicating the final design and not showing removed construction items
- GPS locations for proposed ITS components
- Typical section view
- Communication schematics
- Component details
- Quantity tabulations

5.4.9.2 Released for Construction Submittals

Following the approved Quality Management Plan process, review RFC Documents prior to submitting for the Department’s review. Incorporate comments from the in-progress design reviews or resubmittals into the design and resolve all concerns and questions to the satisfaction of the Department.

RFC Documents are intended to allow construction to begin on segments or elements of the Project as the design progresses and before final design is complete. Submit RFC Documents for the Department’s review prior to construction. RFC packages that involve Work on a railroad

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right-of-way will not be accepted by the Department until the Work has been approved by the Railroad.

Do not start construction of any Work included in RFC Documents until applicable government entities, Railroads, and Utilities approve and the Department accepts the Plans. Proceed with construction of any item, element, or phase covered by the Design Quality Manager's statement approving construction progress only to the extent covered by the Design Documents included in that approval or acceptance. Before progressing further with construction, complete the next phase of design or complete the final design, and obtain the Department's acceptance. Check any subsequent phases of design to be Released for Construction and obtain approval by the Design Quality Manager in the same manner as indicated above for the initial item or element.

Proceeding with construction of elements or portions of the Project in accordance with RFC Documents before the design of the entire Project has been completed is at the Design-Builder's sole risk.

5.4.9.2.1 Released for Construction ADA Submittals

Submit ADA and traffic signal plans together for any segment or element of Work that includes pedestrian facilities. RFC submittals that include pedestrian facilities at a signalized intersection will not be reviewed unless they are submitted together with ADA plans.

5.4.9.3 Resubmittal Process

Resubmittal of any design submittal may be required if deemed necessary by the Design Quality Manager or the Department. Address all comments received from a prior submittal in a manner satisfactory to the commenting party. The Design-Builder is not entitled to any additional compensation or time extension due to any resubmittal requirement by the Design Quality Manager's review process or the Department.

Resubmit the submittal as many times as necessary to address the comments of the Design Quality Manager's review process and the Department.

Continuing design activities is at the Design-Builder's sole risk during the resubmittal process. Such continuation in no way relieves the Design-Builder of the responsibility to incorporate the comments of the resubmittal process and the Department into the Design Documents.

Upon completion of the Design Quality Manager's review, forward resubmittals to the Department for review and comment. If the Department requests additional information during review of the resubmittal, the Design Quality Manager conducts an additional review of the resubmitted items.

5.4.9.4 Design Review

5.4.9.4.1 General

Submit all RFC packages for the Department's review through the electronic submittal system. The Department will review the RFC package and determine if the package meets the

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requirements of the Contract Documents and applicable governmental approvals. The Department may also include suggestions to improve the performance and maintainability of the package (fitness for use). The Department will log and track comments on each RFC package. Respond and resolve all comments resulting from the Department's review. If necessary, the Design-Builder and the Department may need to meet to resolve the comments. If required, resubmit the RFC package in accordance with the resubmittal process identified earlier in this section.

The Department's acceptance will not constitute approval of the design or subsequent construction, nor relieve the Design-Builder of its responsibility to meet the Contract requirements. Whether or not the Department provides the Design-Builder with the authority to begin construction on elements of the Project prior to completion of the entire design, the Design-Builder bears the responsibility to ensure that construction meets the requirements of the Contract Documents, applicable law, and applicable governmental approvals.

Coordinate the submittal of all design packages, and do not submit more than five design packages per week to the Department for its review. If the Department receives more than five design packages in one week, it may elect, at its sole discretion, to either (a) consider the excess design packages submitted for the following week or weeks a "deferral," or (b) review the excess submittals as they would review the first five. If the Department elects option (b), the Department will notify the Design-Builder of its election no later than 5 Working Days after receiving the excess submittals. If the Department does not provide notice after 5 Working Days, consider the receipt of excess submittals to be treated as a deferral.

The Department will complete its review of the Design-Builder's plans and submittals based on the following review timeline requirements:

- Layout reviews: Working Days
- Preliminary bridge submittal: Working Days
- In-progress design review: Working Days
- Released for construction submittal: Working Days
- Released for construction structures submittal: Working Days
- Early construction submittal: Working Days
- RFI submittal: 3 Working Days
- Field Design Changes: Working Days
- All other submittals not covered above or in other sections of Book 2: 15 Working Days

Review timelines noted above will begin when the Design-Builder has uploaded the submittal to the document control system and made it available to the Department for review. Each design package above may go through multiple iterations of review by the Department before acceptance. After the initial review period, the Department will complete its review of

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subsequent iterations or accept the package within 5 Working Days (or 15 Working Days for Layout reviews). These review timelines depict the maximum allowed time the Department has to review the associated submittals and respond to the Design-Builder without impacting the overall Project schedule. The actual Department review timeline may be directly related to the extent of involvement the Design-Builder allows during the design development process. More up-front Department involvement may shorten the review timelines. The Department, however, makes no guarantees of a streamlined review process for any design submittal.

Department acceptance occurs when the Department PM or designee signs the title sheet and each applicable plan sheet. Cross-sections do not require signatures. Provide a signature location for the Department PM on required sheets.

5.4.9.4.2 Verification Visits

Throughout the design process, the Department may make verification visits to discuss and verify design progress and overall Project progress with respect to the QM. If, in the sole opinion of the Department, the Design-Builder is not meeting the goals and objectives of the QM, suspend all Project Work. The Department may withhold payment for any design activities not meeting quality requirements.

5.4.9.5 Early Start of Construction

Early Start of Construction items are portions of the Project that can be started in the field and changed by the Design-Builder as the design proceeds. Such items may include removals, clearing and grubbing, subgrade construction, stripping topsoil, and temporary traffic crossovers.

Early Start of Construction items may be packaged into Design Documents by the Design-Builder to initiate an Early Start of Construction. The Early Start of Construction requirements apply to any Work that is performed by the Design-Builder before receiving the Department's acceptance of the Released for Construction Documents. The Department, at its sole discretion, may defer or reject Early Start of Construction for any portion or item that was requested by the Design-Builder.

All such Project Work is performed at the sole risk of the Design-Builder. If, as a result of the review process on the formal RFC Documents for the Work, the Department identifies any necessary construction modifications or changes to already-completed Project elements performed under the Early Start of Construction, make any and all such construction modifications, removals, or reconfigurations at the Design-Builder's sole cost and expense, without any entitlement to time extensions or adjustment in the Contract Price.

The Department and the Design-Builder's Design Quality Manager will agree upon design quality procedures for Early Start of Construction packages, which include, among other things, a process for distributing Construction Documents to the field staff of both the Department and the Design-Builder.

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Early Start of Construction Plans must be signed and dated by a Wisconsin-licensed Professional Engineer, stamped “Early Start of Construction Plans,” and distributed to the Department and the appropriate field staff. They must also be included in any future RFC Documents that incorporate this Work. Submit a revised Environmental Management Plan for acceptance along with the Early Start of Construction Plan if the associated Work affects commitments in ways that have not already been accepted.

Within 5 Working Days of receiving the Design-Builder’s request for Early Start of Construction, the Department will notify the Design-Builder in writing if the Early Start of Construction is Accepted or Rejected. The Department reserves the right to Accept or Reject any Early Start of Construction at its sole discretion.

Obtain the Department’s signature for all Early Start of Construction documents prior to release of those documents for construction.

5.4.9.6 Preliminary Bridge Plans

Prepare Preliminary Bridge Plans that show all pertinent details describing the pier and abutment locations; alignment and profile; type, width, length, number of spans, and clearances; substructures; soil borings and foundations; visual quality features; hydraulics; construction staging; removals; lighting; and Utilities. At a minimum, ensure that Preliminary Bridge Plans are in accordance with the WisDOT *Bridge Manual* and the Geotechnical Report (include as an attachment). Ensure that all drawing files are prepared meeting WisDOT standards as of the RFP Release Date.

Prepare the Preliminary Bridge Plan in accordance with WisDOT *Bridge Manual* Section 6.2.2.3. The Plan should include, at a minimum, a plan view, an elevation view, and a cross-section view.

The drawings for preliminary layouts are on sheets having an overall width of 11 inches and an overall length of 17 inches, and should be placed within the current sheet border under the #8 tab.

Prepare the structure survey report in accordance with the WisDOT *Bridge Manual* and submit for review with the Preliminary Bridge Plan.

5.4.9.7 Record Plans

Provide the Department with Record Plans for each bridge that depicts the final completed design. The Record Plans constitute all RFC Documents certified by the Design-Builder and accepted by the Department. Where individual sheets have been revised, include only the most current RFC Document in the Record Plans. The first sheet of the Record Plans contains the original stamp and signature from the Design-Builder and the Department.

The general plan sheet should contain a title block for signature by the Chief Structures Design Engineer. If not included on the general plan sheet, the Record Plans must include an index of

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sheets with sheet numbers that is stamped and sealed by the Design-Builder. All sheet numbers must be unique and sequential unless otherwise authorized by the Department.

5.4.9.8 As-Built Documents

5.4.9.8.1 General

Submit As-Built Documents that consist of the following:

- Surveyed electronic data
- As-built drawings
- Final Project files
- Final calculations

5.4.9.8.2 As-Built Drawings

Provide as-built drawings to the Department that depict the final completed Project, including all changes to RFC submittals resulting from the Notice of Design Change (NDC) and Final Design Change (FDC) processes, in addition to any modifications in the field that were not captured in the NDC and FDC processes.

Include the federal project number on the title sheet of as-built drawings.

Ensure that the As-Built Documents meet the requirements of the RFC Documents and the following additional requirements:

- Assemble as-built drawings into a single set of plans or a group of plans with one master index that explains how each plan package is organized and what each plan package includes. The master index must provide enough detail and clarity that a person unfamiliar with the Project can identify which plan package includes specific Project features without opening the plan package. While the plans must appear similar to the WisDOT Final Design Sample Plan, RFC plans do not need to be broken apart and reassembled into a single set of plans.
- Provide as-built drawings in both Civil 3D and .pdf format. The Civil 3D files must be the RFC files updated to include all NDC changes and any FDC changes that included updates to the RFC Civil 3D files. FDCs that do not result in changes to Civil 3D files need not be captured in these Civil 3D drawings. The .pdf files will be the RFC files updated with all NDC changes and FDC changes. The FDC changes may be shown on the .pdf files by 1) modifying the Civil 3D files to cloud and showing FDC changes, 2) modifying the .pdf electronically to cloud and showing changes, or 3) modifying the .pdf with hand markups and scanning the updated drawing.
- Provide a certification signed by the Design-Builder’s PM on the cover sheet of the .pdf as-builts that states “I hereby certify that the Project was completed in accordance with the plans, the Contract Documents, the governmental approvals, and applicable law.”

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5.4.9.8.3 Final Project Files

Separately from the electronic data collection and as-built drawings, provide all final Project files, including base mapping (topography), Working Drawings, design reports, design models, specifications, calculations, and electronic CADD data. Organize electronic files into a logical folder structure beginning with the base folders listed in Exhibit 5-B (Electronic File Folder List), with all files having discrete names. For example, all files used for retaining wall calculations are stored in a folder called Walls, with the working files for each wall separated into its own sub-folder. Store sheet files in sub-folders logically named after the plan set they portray under a parent folder called Plan Sheets. Separate all files used in a cross-section run into sub-folders by run name under a parent folder called XS. For Civil 3D files, retain or restore the logic for reference files.

Produce reports documenting the location of the as-built alignments, profiles, structure locations, Utilities, and survey control monument within the Project.

Provide the Department with an as-built survey base map file in Civil 3D V8i series format (.DGN), including only supplemental information to the survey base map provided by the Department.

Provide a Civil 3D database file (.GPK) containing coordinate geometry.

5.4.9.8.4 Final Calculations

Provide final calculations that include any changes resulting from NDCs and FDCs, ensuring the following are complete and correct:

- Title blocks of calculation sheets include the calculation title, file number, page number, initials of the designer and the checker, and dates of design and checking. The calculation title sheet will be stamped and signed by a Wisconsin-licensed Professional Engineer.
- Calculations indicate the design requirement, the assumptions made, the methods used, the source of the information, and the cross-reference for the applicable design drawings.
- Structure calculations and bridge rating calculations performed using software are independently checked by a Wisconsin-licensed Professional Engineer, and hand calculations are verified.
- Calculations that have been superseded in the NDC and FDC processes are clearly marked as superseded, and updated calculations are included.
- Calculations are bound and numbered with a table of contents.
- Calculations identify the code or standard used and indicate the specific section referenced in the right-hand column.
- Calculations reference the computer programs used.

Manual calculations are printed, neatly and legibly, on 8½- by 11-inch or 11- by 17-inch standard computation sheets and provided in .pdf format.

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5.4.9.8.5 Additional Requirements

In addition to the As-Built Documents listed in this section, see the following:

Section 4 (Environmental Compliance) includes As-Built Document requirements for the Final Wetland Impact and Mitigation Plan.

5.4.10 Construction Requirements

5.4.10.1 General

5.4.10.2 Review and Disposition of Non-Conforming Product

Ensure that non-conformances identified during the design verification and checking, testing, and inspection activities are recorded. Ensure the resolution of all non-conformances, including those of Subcontractors or Suppliers.

Within 5 Days of the identification of a construction-related non-conformance by the Department, propose a resolution for the Department's acceptance or approval.

Following acceptance or approval of the proposed resolution by the Department, notify the Department 24 hours prior to implementing the proposed solution so that the Department may witness the implementation (should the Department so choose).

5.4.10.3 Corrective and Preventive Action

5.4.10.3.1 General

Ensure the QM describes the corrective and preventive actions the Design-Builder will take upon the identification of non-conformances, identified internally or by the Department.

Review the cause of non-conformances and develop corrective action to prevent recurrence. Document proposed corrective action in a format and medium acceptable to the Department. Advise the Department when the corrective action has been implemented so the Department may verify the implementation (should the Department so choose).

5.4.10.3.2 Corrective and Preventive Action

Within 5 Days of the identification of a major or systemic problem by either Design-Builder or the Department staff, propose to the Department, for approval, a corrective or preventive action to prevent the recurrence of the problem. Update the quality management system to incorporate the Approved corrective action.

5.4.11 Construction Criteria

5.4.11.1 Working Drawings

Generate Working Drawings as necessary to clearly define, control, construct, and inspect the Project. Send these Working Drawings back to the Design-Builder's design team for review and internal approval by qualified personnel. All Working Drawings must be reviewed by the Design-

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Builder and revised accordingly until the Design-Builder takes no exceptions to the content of the Working Drawings, which are then stamped “No Exceptions Taken.” Working Drawings requiring signing per the Standard Specifications must be signed by a Wisconsin-licensed Professional Engineer and include the printed name of the Engineer, and his/her company name and phone number, prior to being issued for construction.

After the Department acceptance of RFC plans, submit Working Drawings for items that are not fully detailed in the Design Documents as RFC Documents per the Standard Specifications.

Consult with the Department and all other applicable governmental entities that may require review of Working Drawings, and coordinate the preparation, submittal, and review of all such Working Drawings. Where governmental approvals or approvals from a Utility Owner are required, submit Working Drawings to the applicable party for review and approval in accordance with its requirements.

Prepare Working Drawings and calculations for excavation shoring, cribs, cofferdams, falsework, overhead signs, temporary support systems, formwork, and other temporary Project elements that describe the methods of construction proposed to be used for the Project in accordance with the QM. Receipt of submittals for temporary Project elements by the Department in no way constitutes approval of the planned Project element, or impose any liability upon the Department.

Provide approved Working Drawings, both those that are required to be submitted as RFC Documents and those that are not, to the Department at least 5 Working Days prior to the start of any construction detailed by those drawings. Make no changes to any approved Working Drawing. For Working Drawings that are required to be submitted as RFC Documents, the Department’s acceptance must be obtained prior to this 5-day period.

5.4.12 Materials/Testing Requirements

5.4.12.1 Access and Testing

Representatives of agencies of the federal government and representatives of other agencies of Wisconsin have the right to inspect the Work to the same extent provided above for the Department and as required by Governmental Rules.

Provide safe access to the Work, its organization, and all Subcontractor and Supplier organizations to allow the Department to carry out verification activities. This will include the taking of samples for the purposes of testing, the examination of records, and interviews with personnel from the Design-Builder’s organization and all Subcontractor and Supplier organizations.

Do not use the results of verification activities carried out by parties other than the Design-Builder as a substitute for Design-Builder’s own quality activities, unless otherwise Approved in writing by the Department.

Provide the Department with copies of requested records within 2 Days of receipt of request.

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When requested, advise the Department of the time, to within 4-hour accuracy, when a specific activity is scheduled within the next 5 Days.

5.4.13 Instrumentation and Monitoring

5.4.13.1 Internal Quality Audits

Ensure that internal quality audits for each element of the quality management system are performed at least every 6 months, or a minimum of two quality audits during the Project, whichever is greater.

5.5 Deliverables

5.5.1 General Requirements

Furnish electronic versions of all Project deliverables to the Department. Follow any additional requirements, such as submitting to another agency or furnishing hardcopies, set forth elsewhere in the Contract Documents. Each document transmitted to the Department is controlled by a unique document control number.

Upload electronic copies of all documents generated under the Contract, including all Project deliverables, to the document control system in native format and software-generated PDF format. An example would include creating PDF files from Civil 3D drawings (DGN) for RFC plan sheets. Scanned PDF files will not be accepted unless the original document is in handwritten form or if the original is not electronic.

Upload all electronic data for plan submittals, including Civil 3D and all other design software-specific electronic files to be submitted, to the document control system in native format.

Ensure that all deliverables include a signed and dated certification by the originator of the deliverable assuring the deliverable is complete and meets the Contract requirements.

5.5.2 Final Quality Manual

5.5.2.1 Submittal and Approval

Submit for the Department's approval the QM as a condition of Notice to Proceed 2 (NTP2). The Department will respond within 20 Working Days of receipt of the QM. Submit an electronic copy on the Project Management Information System.

If the Department issues NTP2 prior to Approving the entire QM, the Department will not Accept RFC Documents until the Design QM is Approved. The Department will not Accept RFC Documents or early release documents for elements of construction that do not have relevant sections of the QM Approved.

Design undertaken before approval of the QM is at the Design-Builder's sole risk. The Department reserves the right to withhold payment for design and construction Work until the

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QM has been Approved. Once the QM is Approved, do not revise any portion without the prior written approval of the Department.

Following approval, submit one hardcopy of the QM and an electronic version in native and PDF format.

5.5.2.2 Track Changes

Track all changes made to the Department's QM templates and clearly depict them to the Department in the Submittals. Submit versions with tracked changes with all native electronic files.

5.5.2.3 Ownership

Acknowledge in each submittal that Design-Builder understands the Department has full and complete ownership of the products submitted and may use all products on this and other projects without any compensation or consideration to the Design-Builder.

5.5.3 Released for Construction Documents

Upon the Department's acceptance and prior to beginning construction, submit one hardcopy of all RFC Documents and PDF versions created with CADD software.

5.5.4 Preliminary Bridge Plans

Submit Preliminary Bridge Plans for all temporary and permanent bridges to the Department for acceptance by the Bureau of Structures before RFC Documents will be Accepted. Provide a copy of the geotechnical report and the bridge hydraulics design recommendations with each Preliminary Bridge Plan. Upload electronic versions in PDF format into the Project Management Information System.

5.5.5 As-Built Documents

Through the document control system, submit one set of electronic files of all As-Built Documents to the Department for acceptance. The Department will advise the Design-Builder of the status of its acceptance of the As-Built Documents within 30 Working Days of receipt. Formal written acceptance of the As-Built Documents must be granted by the Department before Final acceptance. Upon acceptance, upload electronic versions of all As-Built Documents in native and PDF format to the document control system.

5.5.6 Product Data

Upload electronic versions in native and PDF format to the document control system. Ensure that the product data cited in this section are organized and indexed in a manner to allow easy retrieval of information.

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5.5.7 Record Set Plans

Submit an electronic copy of Record Set Plans for all temporary and permanent bridges at least 6 weeks before the bridge is open to traffic.

5.5.8 Working Drawings

Submit electronic copies of all Working Drawings.

5.5.9 Material Testing Reports

5.5.10 Summary of Deliverables

Table 5-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 5-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Quality Manual (QM)	Approval	5.4.1
30% Plan	Acceptance	5.4.7.3
60% Plan	Acceptance	5.4.7.3
Released for Construction Documents	Acceptance	5.4.9.1
Preliminary Bridge Plans	Acceptance	5.4.9.6
Bridge Record Plans	Acceptance	5.4.9.7
As-Built Documents	Acceptance	5.4.9.8
Working Drawings	Acceptance	5.4.11.1
Product Data	Acceptance	5.5.6
Material Testing Reports	Acceptance	5.5.9

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EXHIBITS

All exhibits are provided as electronic files.

Exhibit 5-A Quality Manual Templates

Exhibit 5-B Electronic File Folder List

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6 Utilities

6.1 General

This section applies to all existing and proposed Public, Municipal, and Privately Owned Utilities. Throughout this section, Public, Municipal and Private Utilities may be referred to as Utilities. This section excludes storm water facilities, traffic signals, and intelligent transportation systems (ITS).

6.2 Administrative Requirements

Comply with only those administrative requirements set forth herein that are applicable to Work performed by the Design-Builder.

6.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to Utilities, follow the order of precedence set forth below unless otherwise specified.

- Utility Coordination Task List (Exhibit 2-6-E)
- Wisconsin Administrative Code Chapter Trans 220
- WisDOT Guide to Utility Coordination
- AASHTO Right-of-Way and Utilities Guidelines and Best Practices
- AASHTO Accommodation of Utilities Within Freeway Right-of-Way
- AASHTO Accommodation of Utilities Within Highway Right-of-Way
- FHWA Program Guide: Utility Relocation and Accommodation on Federal-Aid Highway Projects
- AWWA Standards
- GLUMRB Ten States Standards for Water Works
- GLUMRB Ten States Standards Wastewater Facilities
- Remaining standards set forth in Book 3

6.3 WisDOT Responsibilities

6.3.1 Initial Allocation of Responsibility

WisDOT has the legal authority to require the Relocation of Utilities in conflict with the proposed Project. In no way will the Design-Builder assume the legal authority is transferred to the

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Design-Builder. Therefore, certain Utility coordination documents may need to be prepared by the Design-Builder for WisDOT's review and signature.

Communication and coordination with utility owners is imperative to avoid significant impacts to the Project, and to determine specific utility constraints.

6.3.2 WisDOT-Supplied Information

WisDOT has compiled known Utility information within the Project area and has held one Utility coordination meeting. The information received from responsive Utilities has been compiled into Exhibit 2-6-A, which summarizes approximate locations and potential conflicts of the known Utilities; and Exhibit 2-6-B, which summarizes the known anticipated Utility coordination requirements. Exhibit 2-6-A depicts the approximate location of each existing utility.

If the Design-Builder discovers unknown Utilities, Utilities not accurately identified or located, or additional Utility coordination requirements, immediately notify WisDOT and the Utility. If, after the Design-Builder has taken all reasonable steps to avoid Relocation of such unknown Utilities, the unknown Utilities must be relocated, costs, and delays associated with relocating these unknown Utilities will be compensated in accordance with Book 1, Section 13. The Design-Builder's responsibilities regarding these additional unknown Utility Relocations are provided in Book 2, Section 6.3.

6.3 Design-Builder Responsibilities

Hold a Utility Verification Meeting with WisDOT and the Utilities within 4 weeks of Award of the Contract. This meeting will confirm Utility locations, potential conflicts, and coordination requirements with the Design-Builder's design. The Design-Builder will also confirm or begin scheduling Utility Work Plans. All Utility Work Plans will first be reviewed and approved by the Design-Builder and then sent to WisDOT.

Use best efforts to minimize relocations and costs to Utilities, and otherwise be consistent with other requirements of the Contract Documents.

The Design-Builder will be responsible for coordinating its Work and that of its Subcontractors with the various Utilities. The resolution of any conflicts between Utilities and the design and construction of the Project will be the responsibility of the Design-Builder. No additional compensation will be allowed for any delays, inconveniences, or damage sustained by the Design-Builder or its Subcontractors due to interference from Utilities or the operation of relocating Utilities if the circumstances are a result of the Design-Builder's design.

The Design-Builder's obligations with respect to each Utility will include the following:

- Identification, location, and verification of all Utilities located within the Right-of-Way and/or otherwise impacted by the Project. These Utilities may be different than those indicated in the Summary of Existing Utilities and Potential Utility Conflicts, attached as Exhibit 2-6-A.

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- Provide guidance to each Utility regarding the location, type, and breadth of proposed Work and coordinate with them regarding acceptable and advantageous locations for each Utility to Relocate if Relocation is necessary.
- Review and acceptance of each individual Utility's facility removal or Utility Work Plan and circulation of this Utility Work Plan to WisDOT for permit Approval. The Design-Builder's review and acceptance must include a determination that the proposed Utility solution is compatible with the Design-Builder's proposed Work. The Design-Builder will then track and confirm that all necessary Utility Work Plans have been submitted to the WisDOT Project Manager. Permit applications are obtained and submitted online through the Construction Permit System.
- The Design-Builder will follow up with Utilities to ensure that their permit applications are submitted in a timely manner. WisDOT will reject permit reviews that have bypassed the Design-Builder and send them back to the Design-Builder until the Design-Builder submits a signed notification of review and acceptance.
- Coordinate the Utility Work to avoid relocating a Utility more than once. Costs associated with Municipal Utility Relocation and the second and all subsequent relocations of Public Utilities are the responsibility of the Design-Builder.
- Coordinate Work with Utilities so that Utility Work may progress in a reasonable manner, duplication of work may be reduced to a minimum, and services rendered by Utilities will not be unnecessarily interrupted.
- Provide the Utilities with a Project Schedule and notify the Utilities of any Significant Changes to the Schedule as soon as practicable, and coordinate the Utility Work with the Project Schedule.
- Coordinate on the Utility's design review and accommodate the review in the Design-Builder's Project schedule.
- Coordinate with each Utility regarding removal of their facility if it conflicts with proposed Work or has been abandoned within the Right-of-Way.
- Protection of Existing Utilities impacted by the Project, as necessary to ensure their continued safe operation and structural integrity. The Protection of Existing Utilities may be either temporary or permanent. The Design-Builder will be responsible for ensuring that Utilities taken out of service and left in place will be treated in accordance with a method Approved by WisDOT.
- Specific Design-Builder requirements related to Utility accommodations for this Project have been identified and are detailed in the Utility Coordination Clause, included as Exhibit 2-6-B.
- Accurately show the final location of all utilities on the As-Built Documents for the Project.

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- Provide necessary field services to assist in Utility Relocation placement. This may include miscellaneous alignment staking (e.g., centerline staking, edge of pavement staking, curb staking, and Right-of-Way staking). The Design-Builder will ensure existing and proposed Utility facility information is incorporated into Project Plans.
- Provide WisDOT copies of all correspondence between the Design-Builder and Utilities, concurrent with issuance.

6.3.3 Utility Tracking Report

Maintain a Utility Tracking Report that lists all Utilities within the Project limits. The Utility Tracking Report will contain a minimum of the following information for each Utility:

- Utility name and contact information
- Utility facility size and type
- Utility location(s)
- Indication of whether the Utility is in conflict with the proposed Work
- The proposed resolution if Utility is in conflict with proposed Work
- The notification of review and acceptance of proposed Utility Relocation and that all forms have been properly filled out
- The proposed WisDOT permit submittal date or approval date for each Utility
- The proposed start and completion dates of any Utility Relocation Work
- Plan and correspondence distribution dates if applicable

An updated Utility Tracking Report will be submitted every 4 weeks unless a greater frequency is Approved by the WisDOT Project Manager. These reports will be submitted with Progress Reports according to Book 2, Section 2.3.2.3.

6.3.4 Procedures for Utility Coordination/Relocation

There may be affected Utilities that have not been identified or are not responding. The following outlines the responsibilities regarding such Utilities.

The Design-Builder will make diligent efforts to obtain the cooperation of each Utility. Notify WisDOT immediately if a Utility is not cooperating, as defined by a failure to respond to multiple communications by the Design-Builder within 2 weeks of initial written notice to the Utility. WisDOT will be available, as necessary, to assist in resolving Utility coordination conflicts. Any assistance provided by WisDOT, including legal action, will not relieve the Design-Builder of its responsibility for the satisfactory completion of Utility coordination and proposed Work.

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6.3.5 Coordination and Cooperation

Discuss and ensure that eligible reimbursable Private Utility Relocations are identified. Confirm that the utilities submit the necessary information as outlined by WisDOT. Review and verify that the appropriate items are included in the Utilities request for Relocation reimbursement prior to submitting to the WisDOT Project Manager for processing and Authorization.

The Design-Builder will be responsible for verifying the progress of Utility Relocation Work. If it is believed that the Utility will not meet the specified time frame(s), notify the Utility and WisDOT and coordinate an appropriate plan of action.

Distribute preliminary Plans to all Utilities in accordance with WisDOT Specifications. It is important that Plans have Utility locations plotted and provide sufficient detail for Utilities and Designers to determine potential conflicts. Coordinate with the WisDOT Project Manager to distribute the Plans electronically.

Correspondence sent to any Utility will be copied to the WisDOT Project Manager.

The Design-Builder will not be entitled to an increase in the Contract Price for any costs of coordinating with Utilities or for assisting WisDOT in coordinating with Utilities.

6.3.6 Betterments

A proposed Betterment will be added to the scope of the Work if Approved by WisDOT. WisDOT agrees to issue a Change Order increasing the Contract Price on account of any Betterment added to the Utility Work. The amount of any Change Order related to Utilities will be a direct pass-through of the negotiated amount by the Design-Builder, WisDOT, and the Utility Owner (with no additional markups), or if no such price has been negotiated, an amount determined in accordance with the agreement entered into with the Utility. The Design-Builder will not request or accept any payment directly from the Utility Owner for any Betterment added to the Work.

WisDOT may Approve the addition of a Betterment to the scope of the Work in this section only if: (a) the Utility Owner has agreed to the addition of such Betterment to the Work, (b) such Betterment is compatible with the Project, (c) the Utility Owner has agreed to reimburse WisDOT for all the costs thereof, (d) the Utility Owner has agreed as to the method (e.g., negotiated amount, unit prices or time and materials cost basis) of pricing such Work, and (e) it is feasible to separate the cost/pricing of the Betterment work from that for any related Utility Work being furnished or performed by the Design-Builder. Provide WisDOT with such information, analyses and certificates as may be requested by WisDOT in connection with its Approval.

If a proposed Betterment changes the scope of the Work it will not be considered a WisDOT-Directed Change.

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6.4 Utility Permits

6.4.1 TBD

6.5 Deliverables

Unless otherwise indicated, all deliverables will be submitted on the Project Web site in PDF files. At a minimum, submit the following to WisDOT:

Table 6-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 6-1: Non-Exhaustive List of Deliverables

Deliverable	For Acceptance or Approval	Number of Copies	Submittal Schedule	Reference Section
Utility Tracking Report	Acceptance	1	Every 4 weeks	6.3.1
Utility Meeting Minutes	Acceptance	1	After each Utility meeting	6.3
Electronic Permit Application	Approval	1	No later than 3 weeks prior to Utility Relocation to commence	6.3

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EXHIBIT 2-6-A Summary of Existing Utilities and Potential Conflicts

TEMPLATE

EXHIBIT 2-6-B Project Specific Coordination Clause

TEMPLATE

EXHIBIT 2-6-C Approximate Locations of Existing Utilities in Project Area

TEMPLATE

EXHIBIT 2-6-D Sample Notice to Relocate Utility Facilities Letter

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EXHIBIT 2-6-E WisDOT Utility Coordination Task List

REGION
CUSTOMIZED UTILITY COORDINATION TASK LIST

Tasks with Target Date of "If needed" are not anticipated to be required for the Project. "Surveyor" and "Plat P" are responsibilities of the contracted surveyor and plat preparer for the Project; may be different than Design-Builder.

Target Dates for plat-related tasks are for Utility Coordination only; other WisDOT sections may have earlier target date requirements for plat completion. Any item noted as "If needed" may require a contract change order to account for the additional hours.

All tasks will be done in accordance with the *WisDOT Guide to Utility Coordination* unless otherwise noted.

Project Description – Include Design Project ID, Title, Limits, Highway, County			
Construction ID		E/PS&E date	LET date
WisDOT Project Manager		Telephone number	Email address
Design-Builder Name	Contact	Telephone number	Email address

☐ **This is a Trans 220 project** ☐ **This is <u>NOT</u> a Trans 220 project** **(i.e., connecting highway)**

	TASK	Responsible Person			Target Date
		PM	UC	D/B Firm	
1	Provide Concept Definition Report (CDR) and copies of any subsequent revisions to region utility coordinator.	X			
2	Create list of known utilities in the project area (UIN).		X		
3	Verify all utility facilities located within the right-of-way of the proposed improvement, according to Trans. 220.04(1) and *FDM Procedure 18-10-10.*		X		

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	TASK	Responsible Person			Target Date
		PM	UC	D/B Firm	
4	Participate in project kick-off meeting.	X	X	X	If needed
5	**Monthly**: Send copies of all correspondence with utilities and utility-related documents to the PDS-Project Manager (and/or region utility coordinator), including the Trans 220 Log (DT1079). *FDM Procedure 18-1-15*			X	
6	Enter utility milestone dates in TUMS.		X		
7	Prepare and send project notification (DT1077), along with cover letter and exhibits, to all utilities with a potential for facilities in the project area. *Trans. 220.04; FDM Procedure 18-10-10.* ***Note: Submit DT1079 to region utility coordinator and/or update TUMS.***		X		Done
8	Obtain system maps from utilities. Provide copies of new system maps to the region utility coordinator. Compare the system maps with the highway plan information to confirm that all utility facilities are shown properly. Trans. 220.05(1) FDM Procedure 18-10-10		X		Done
9	Coordinate field locates of all utility facilities within project area. *FDM Procedure 18-10-15* ☐ Remove manhole covers. Determine flow line elevations and pipe sizes. ☐ Expose existing utility facilities and obtain elevations (pothole) at the following locations. ***Note: Coordinate this with the utility facility owner.***			Surveyor	Prior to 30%
10	Show existing utility facilities on plat, plans, and cross-sections. ***Note: plot the horizontal locations of all underground and overhead utility facilities on mainline and side road cross sections.***			X	
11	Provide 30% plan to region utility coordinator for review prior to 30% Plan Review Meeting.			X	
	Determine titlework requirements for TLE Acquisition Maps		X		
12	Invite utilities to all Public Information Meetings.			X	
13	Provide information of hazardous material sites to the region utility coordinator, as it is associated with this Project. With this information clearly state what hazardous material has been found, where it has been located, other potential sites, who will be responsible for the removal, handling of the removal, storage of material that has been removed, and the cost associated with remediation of the hazardous material on this Project.			X	Include in 1078
14	Provide information of environmental conditions to the region utility coordinator, as it they associated with this Project. This includes wetlands, bedrock, historical and archaeological sites, endangered species, underground storage tanks, etc.			X	Include in 1078
	Provide Utility Easement Exhibit *FDM Procedure Reference 12-1 General, 5.2 Easements*			Plat P	1 month prior to final plat (2 months prior to RPPMD)
	Review utility easements and determine if affected by acquisition			Plat P	
	Review existing plats for previous conveyances			Plat P	

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	TASK	Responsible Person			Target Date
		PM	UC	D/B Firm	
	Provide tax IDs for acquisition areas			Plat P	
15	Provide a **preliminary** plat to the region utility coordinator for review after all existing utility information, including compensable and non-compensable utility facilities and easements have been identified.			Plat P	1 month prior to final plat (2 months prior to RPPMD)
	Provide utility facility owner names for plat		X		
	Review utility prescriptive rights		X		
	Determine compensable utilities		X		
	Determine if service is compensable		X		
	Verify if utilities on RR by license or easement		X		
	Determine if any long-term leases create compensability		X		
	Review existing PLE/LHE on plats for necessary UTLs		X		
16	Provide a copy of the approved DSR to the region utility coordinator.	X			
17	Provide a **final** recorded plat to the region utility coordinator, including compensable and non-compensable utility facilities and easements.			Plat P	1 month prior to RPPMD
18	Prepare DT1078 plans, plats, and cross-sections, which are all complete enough for use by utility companies in evaluating potential conflicts and developing a relocation design. Depending on utility preference, these can be in paper or electronic format (.dgn files). See related memos: Figure 1-7 and Figure 10-9. Provide to region utility coord.			X	1 month prior to RPPMD
19	Provide DT1078 plans, plats, and cross-sections, which identify all “groundbreaking activities,” to the region utility coordinator for review prior to 60% Plan Review Meeting.			X	
20	Identify potential utility conflicts. If completed by consultant, provide copy to region utility coordinator. *FDM Procedure 18-10-20*			X	Include in 1078
21	Hold utility coordination meeting **before** DT1078 packages are submitted to utility companies.	X	X	X	If needed
22	**NO PLAT:** Prepare and submit Project Plan Transmittal (DT1078) package, along with all DT1078 plans and related exhibits, to each utility within the project area. Include cover letter, potential utility conflict list, utility contact list, and Utility Worksheet (DT2236), according to *Trans. 220.05; FDM Procedure 18-10-30.* ***Note: Submit DT1079 to region utility coordinator and/or update TUMS.***			X	

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	TASK	Responsible Person			Target Date
		PM	UC	D/B Firm	
23	**PLAT:** Prepare and submit Project Plan Transmittal (DT1078) package, along with all DT1078 plans, recorded plat, and related exhibits, to each utility within the project area. Include cover letter, potential utility conflict list, utility contact list, Utility Worksheet (DT2236), Buy America (DT2249), utility agreements, waivers, and release of rights. According to Trans. 220.05, *FDM Procedure 18-10-30 and 18-15-15.* ***Note: Submit DT1079 to region utility coordinator and/or update TUMS.***		X	X	**RPPMD**
24	Provide to the region utility coordinator all plan changes from previous utility plans submittals, as required. *Trans. 220.05(12); FDM Procedure 18-10-*45. ***Note: repeat task 22 and/or task 23 as described above, if necessary.***			X	ASAP
25	Hold utility coordination meetings **after** the DT1078 packets have been submitted to utilities, but before the Utility Work Sheets (DT2236) are due. *Trans. 220.05(04); FDM Procedure 18-10-35 and 18-20-5*	X	X	X	If needed
26	Send notice to utilities of having received their Utility Worksheet (DT2236), utility relocation cost estimate, release of rights, waiver letter, and utility agreement. An email notice is acceptable. (cc: the region utility coordinator.)			X	
27	Review utility work plans as they are received, include review by the region utility coordinator. Recommend corrective action if necessary. *FDM Procedure 18-10-35*		X	X	
28	Resolve with each utility any conflicts among the various utility work plans. *Trans. 220.05(4)*			X	
29	Review utility relocation cost estimate, agreements/waiver, and release of rights, as they are received *FDM Procedure18-15-20 and 18-20-1*. ***Note: Only the Utility Coordinator is to negotiate utility compensation.***		X		
30	Submit the utility relocation cost estimates, agreements/waiver, and release of rights, to the region utility coordinator as they are received. ***Note: Only the Utility Coordinator is to negotiate utility compensation.***			X	
31	Submit utility relocation cost estimates, original agreements, and recorded release of rights to Central Office for review and approval.		X		
32	Record releases of rights.		X		
33	Consult with and recommend work plan approval from region utility coordinator. *FDM Procedure 18-10-35; Trans. 220.05(7)*			X	
34	Submit work plan approval to utility. *Trans. 220.05(7)*			X	
35	Provide **monthly** updates to the region utility coordinator regarding land acquisition, including early acquisition, as it is associated with this project.	X			
36	Provide Pre-PS&E plans and plat to region utility coordinator for review prior to Pre-PS&E Plan Review Meeting.			X	2 months prior to E/PSE
37	Review Utility Permit (DT1553) applications for compatibility with PS&E plans and resolve corrective action if necessary.			X	
38	Approve Utility Permit (DT1553) applications.		UPC		

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	TASK	Responsible Person			Target Date
		PM	UC	D/B Firm	
39	Conduct field meetings with utilities, as required.	X	X	X	If needed
40	Write the utility section of the highway contract special provisions, based upon approved work plans provided by the utility owners.			X	
41	Submit the utility section of the highway contract special provisions to the region utility coordinator for review and approval.			X	
42	Update utility notes and utility contacts on the General Notes sheet based upon information provided by utilities from work plans.			X	
43	Prepare Utility Status Report (DT1080), obtain digital signature from region utility coordinator prior to PS&E e-submittal. *FDM Procedure 18-10-40.*			X	1 month prior to E/PSE
44	Provide field staking for utilities, as needed. Right-of-way staking is needed only in the areas where utility facilities will be placed, not the entire project. Estimate this will be needed **1** times.			Surveyor	
45	Send final plan set and copy of the utility portion of the highway contract special provisions to each utility with facilities in the project area just prior to or soon after the final PS&E. *FDM Procedure 18-10-45*			X Link to FTP	
46	Hold a utility coordination meeting **after** all work plans have been approved but before utility relocations begin. *Chapter Trans. 220.05(04); FDM Procedure 18-10-35 and 18-10-45*	X	X	X	If needed
47	Monitor and report to the region utility coordinator regarding the status of all compensable and non-compensable utility relocations. **X** Including all utility relocations that will be started and completed prior to construction (i.e., Pre-Construction Meeting). **X** Including all utility relocations that will be started prior to construction and completed during construction. _____ Including all utility relocations started and completed during construction.			X	
48	Conduct a Pre-Construction **Utility** Meeting with the construction contractor and all affected utilities to discuss the status of utility relocations and utility coordination necessary during construction.	X	X	X	If needed
49	Prior to the Pre-Construction meeting, contact each utility to discuss status of relocation effort, and be prepared to discuss the status of the relocation effort at the Pre-Construction Meeting.		X	X	
50	Process utility agreement change orders.		X		
51	Process utility second moves.		X		
52	Process utility billings.		X		

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7 Right-of-Way

7.1 General

The Department will acquire all Right-of-Way (R/W) interests necessary for the Project. Exhibit 7-A (TPP) Transportation Project Plat, Traditional Plat, or Acquisition Exhibits) indicates the existing R/W lines and those parcels being acquired for the Project. The (TPP) Transportation Project Plat, Traditional Plat, or Acquisition Exhibits also indicates any fee R/W, permanent easements, highway easements, Access Rights, Utility Releases, or Temporary Easements being acquired from each parcel by WisDOT for the Project. Transportation Project Plats (TTPs) will be used to acquire all permanent acquisition interests need for the Project. Temporary interests that are needed for the Project will be included on the TPP. Traditional Plats will only be used to acquire temporary interests except for connecting highway and Local Public Agency (LPA) projects. Refer to the WisDOT *FDM*, Chapter 12 for the use of Acquisition Exhibits. Do not enter into negotiations for purchase of any property or property rights identified within the (TPP) Transportation Project Plat, Traditional Plat, or Acquisition Exhibits.

7.2 Administrative Requirements

7.2.1 Standards

In the event of a conflict among the standards set forth in Book 3 relating to R/W activities, follow the order of precedence set forth below, unless otherwise specified:

- WisDOT *Facilities Development Manual, Chapter 12*
- Remaining standards set forth in Book 3

Comply with all procedural requirements of the WisDOT *Facilities Development Manual*, Chapter 12 that pertain to WisDOT and its personnel.

7.2.2 Meeting Requirements

7.2.3 Equipment/Software

Prepare all electronic drawings in accordance with WisDOT Standards. Prepare all reports and documents in Microsoft Word format.

7.3 Design Requirements

7.3.1 General

The (TPP) Transportation Project Plat, Traditional Plat, or Acquisition Exhibits consists of various electronic graphical file elements from multiple Department sources as depicted in Exhibit 7–A.

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Use the following additional resources (available from WisDOT):

7.3.2 Investigations/Supplemental Work

7.3.3 Design Criteria

7.3.3.1 Acquisition Activities

The Department will be responsible for payments to all property owners for purchase of temporary and permanent R/W interests and for Relocation payments.

Upon request by the Design-Builder, the Department may acquire additional Construction Easements outside of those already acquired for the Project, if determined by the Department to be beneficial for the Project. The Department will accomplish all parcel acquisition activities unless otherwise indicated below. Schedule implications associated with the acquisition of Construction Easements are the responsibility of the Design-Builder. The cost of such parcel acquisitions will be deducted from the Contract Price in accordance with Book 1, Section 6.1.2.

For acquisition of additional R/W interests and/or Construction Easements, the Department will provide an R/W authorization map for the Design-Builder to approve prior to the Department's proceeding with the acquisition. The Design-Builder will approve R/W interests prior to acquisition beginning.

7.3.3.1.1 Temporary Limited Easements

Notify the Department in writing of all temporary limited easement necessary for construction of the Project based on the Design-Builder's Release for Construction (RFC) documents. Identify the temporary limited easement sought and include drawings depicting proposed construction limits and cross-sections. the Department will be responsible for the acquisition of all temporary limited easement for the Project at the Design-Builder's cost. Acquisition of temporary limited easement by the Department could take up to 24 calendar months from the time the written notification is submitted. Schedule implications associated with the acquisition of temporary limited easement are the responsibility of the Design-Builder.

7.3.3.2 Identification of New R/W Interests

If new R/W interests are necessary, prepare and submit a written request to the Department for consideration. Identify the additional R/W interest sought, along with a justification for its need, and include drawings depicting proposed geometric designs, construction limits, and cross-sections. The Department will review the request, determine whether the acquisition is acceptable and within the scope of the environmental documentation, and, if Approved, provide notification in writing regarding the schedule and process required to complete the acquisition. The Department is responsible for obtaining any required municipal consent, if necessary, due to the additional R/W acquisition. The Department will require up to 24 calendar months for acquisition from the time of the Department's Approval. If the additional R/W required is currently public road R/W, the Department will require 90 to 120 Days to obtain this R/W.

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7.3.4 Reports and Plans

7.4 Construction Requirements

7.4.1 General

Complete all Work for the Project within the R/W limits provided in Exhibit 7-A.

7.4.2 Construction Criteria

Construct all Project elements within the R/W limits provided by the Department. Do not construct permanent facilities within the limits of a Temporary and/or Construction Easement(s).

7.4.3 Materials/Testing Requirements

7.4.4 Instrumentation/Monitoring Plan

7.5 Deliverables

Table 7-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 7-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference

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EXHIBITS

All exhibits are provided as electronic files.

Exhibit 7-A Right-of-Way (TPP) Transportation Project Plat, Traditional Plat, or Acquisition Exhibits

Exhibit 7-B Utility Exhibits

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8 Geotechnical

8.1 General

This section describes the requirements for geotechnical investigations, geotechnical instrumentation and monitoring, geotechnical analysis and design, settlement criteria, and vibration monitoring.

8.2 Administrative Requirements

8.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to geotechnical, follow the order of precedence set forth below unless otherwise specified:

- WisDOT *Facilities Development Manual*
- WisDOT *Geotechnical Manual*
- WisDOT *Bridge Manual*
- WisDOT Bridge Manual Standard Drawings
- *WisDOT Construction Materials Manual*
- Association of State Highway and Transportation Officials (AASHTO) *Manual on Subsurface Investigations*
- AASHTO *Laboratory Specifications*
- AASHTO *LRFD Bridge Design Specifications*
- AASHTO *LRFD Bridge Construction Specifications*
- AASHTO *Standard Specifications for Highway Bridges*
- AASHTO *LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*
- FHWA publications
- ASTM Standards
- Other standards set forth in Book 3

8.2.2 Meeting Requirements

Schedule and facilitate a meeting with the Department to review the Contractor’s proposed Subsurface Investigation Plan prior to performing field work.

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After reviewing the available geotechnical exploration information provided and obtained from additional Site investigation, but before commencing with geotechnical analysis and design, schedule and facilitate a meeting to allow the Department the opportunity to comment on preliminary geotechnical findings, interpretations, and recommendations.

If in situ foundations or existing structures will be reused in whole or in part, schedule and facilitate a meeting with the Department to review necessary requirements for meeting current Load Resistance Factor Design (LRFD) requirements and any Site-specific requirements or testing for evaluating or establishing condition, integrity, and performance of existing features.

8.2.3 Equipment/Software

8.2.3.1 Geotechnical Boring/Sounding Database and Electronic Data Transfer

Use Bentley gINT© for Windows (Version 8 or higher) or a compatible computer program to develop electronic final foundation boring logs.

8.2.4 Permits/Authorizations

Obtain all necessary permits and authorizations that are required to perform investigations or are otherwise associated with providing geotechnical services for the Project, including Utility clearance, property access, and roadway safety and traffic control.

Perform necessary notifications and obtain all necessary approvals and variances needed for installation of environmental wells or groundwater monitoring wells as defined by the Wisconsin Department of Natural Resources (WDNR).

Where recycled, reclaimed, manufactured, or other non-virgin mineral aggregates are used as fill, ensure that all necessary permits, approvals, and authorizations for use are researched and obtained. Obtain the Department and WDNR approval for use of any construction materials that have the potential to release chemicals, affect pH, impact groundwater, cause corrosion or damage to metal components, or clog drainage systems.

8.2.4.1 Certification Requirements

Perform all soil laboratory testing and analysis at an accredited Department resource laboratory and as outlined in Section 2 (Project Management) for the geotechnical tests described in the WisDOT *Geotechnical Manual* and in this section.

8.3 Design Requirements

8.3.1 General

Provide geotechnical analysis and design for all structures and improvements, including, but not limited to: bridges, retaining walls, embankments, cut slopes, reinforced soil slopes, noise walls, sign structures, lighting structures, culverts, utilities, ground improvement systems, and

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stormwater management facilities. Refer to Section 10 (Pavement and Roadway Materials) of this volume for requirements related to pavement design for the Project.

8.3.2 Investigations and Supplemental Investigations

The Department has supplied subsurface investigation information in Exhibit 8-A. The information provided is not comprehensive and may not be sufficient to effectively design all geotechnical elements on the Project to meet construction and long-term performance requirements. Due to the nature, variability, and extent of the Site, geotechnical investigation beyond the minimum requirements established in the WisDOT *Geotechnical Manual* may be required. It is the Contractor's responsibility to design and execute supplemental subsurface investigations that ensure constructed Work meets the Contract requirements.

8.3.2.1 Subsurface Investigations

Prepare and submit a Subsurface Investigation Plan at least 5 Working Days prior to conducting supplemental subsurface investigations. Additional advance review of the Subsurface Investigation Plan may be required for large and complex projects. Soil boring locations required for the pavement design for the Project should be included in the Subsurface Investigation Plan for the Project. Requirements of the pavement investigation program are presented in Section 10 (Pavement and Roadway Materials) of this volume. Subsurface investigations may include soil borings, CPT soundings, geophysical survey, or other methods. The full scope of the investigation program should be depicted on the Subsurface Investigation Plan. Subsurface Investigation Plan must include traffic control plans meeting the requirements of the Department and the MUTCD.

Conduct additional subsurface investigations and provide the investigation to support subsequent geotechnical analysis and design necessary to complete required Site Investigation Report (SIR) documents and comply with the following:

- Satisfy the minimum subsurface investigation requirements for Project structure (non-roadway or pavement) foundations and embankment features as required by the WisDOT *Geotechnical Manual*.
- Supplement information provided in the exhibits to this section to support the Contractor's designs (structure types and locations and associated performance tolerances).
- Provide sufficient information to support calculations for accurate prediction of stability and deformation.
- Provide necessary information on stratigraphy, material properties, permeability, water levels, and pressures for design.
- Provide information for the analysis and repair of any unexpected failures that occur during the performance of the Work (e.g., failures of slopes or temporary shoring).
- Characterize the Site geology where design phase load tests are performed:

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- Advance one foundation boring within 5 feet of each proposed test pile or test shaft location to define the subsurface geology in the immediate vicinity of the test element.
- Perform this investigation prior to installation of the test element.

Prepare and provide electronic copies of the final logs for each foundation boring, cone penetration (CPT) sounding, or related advance, completed as part of the supplemental subsurface investigation. Prepare and provide graphical plots/output of the interpreted results of geophysical investigations.

Prepare and provide images/output and geologic interpretations from these investigations. Present Project geotechnical information (simplified graphics) on plans, profiles, and cross-sections for inclusion in the SIRs and Project plans, as needed, to represent subsurface conditions with respect to in-place and proposed construction.

Provide a complete electronic gINT file of all supplemental borings and soundings using the WisDOT file template.

Transmit to the Department gINT software boring logs for all completed borings, using the Department's gINT template (contact Dan Reid for the template, 608-246-7946). Send these to the following email location at the time of RFC submittal: DOTDTSDGeotechnicalgINT@dot.wi.gov.

Transmit to the Department all soils laboratory testing summary and testing data sheets for tests performed on the soil and rock samples collected during the investigation. In addition, transmit the results of any field tests including vane shear tests, pressure meter tests, and cone penetrometer tests. Send this in a .pdf format that references the Department's design Project I.D., and send them to the followings email location at the time of RFC submittal: DOTDTSDGeotechnicalSirLab@dot.wi.gov.

Transmit to the Department all Soil Reports relating to structures, roadways, pavements, and environment. Send this in a .pdf format that references the Department's design Project I.D., and send them to the followings email location at the time of RFC submittal: DOTDTSDGeotechnicalSirLab@dot.wi.gov.

8.3.3 Design Criteria

8.3.3.1 General

Perform geotechnical designs and provide an SIR following the requirements of Chapter 10 of WisDOT's Bridge Manual and other Standards, and as necessary to support the Contractor's design.

8.3.3.2 Analysis and Design

Perform geotechnical analysis based on field, lab, and monitoring information and the proposed structural or earthwork design geometry, location, loading, and performance requirements for stability and deformation.

TEMPLATE

Prepare SIR documents for:

- Structures (including, but not limited to bridges, culverts, walls, and reinforced soil slopes)
- Embankments greater than 15 feet in height, or where more than 15 vertical feet of fill are added to an existing embankment
- Embankments where more than 4 inches of settlement is anticipated during construction
- Embankments where side hill fills of over 5 vertical feet are being built on existing embankments constructed over in situ compressible soils
- Embankments supported by ground improvement techniques
- Rock cut slopes
- Soil cut slopes greater than 15 feet
- Stormwater management facilities
- Areas where temporary construction, such as large stockpiles of material or temporary excavations of soils, or dewatering activities may impact roadways or in-place structures

Perform all foundation analyses and designs using the LRFD method. Use Allowable Stress Design Method (ASD) only where LRFD design methods do not yet exist in the most current AASHTO Standards.

8.3.3.3 Ground Replacement Techniques

The following techniques are pre-Approved for use on the Project to either replace poor foundation soils or to use as embankment fills to address potential settlement issues:

- Expanded polystyrene (EPS) geofoam; refer to requirements established in the special provisions
- Cellular concrete
- Lightweight aggregate (LWA)
- Aggregate or other constructed shear key installation
- Soil removal and replacement
- Soil removal and replacement with geosynthetic separation and/or reinforcement

Use of the above techniques is dependent on analyses to confirm the technique is appropriate and can resist the loads that will be applied, and Department concurrence with the analysis results. Obtain the Department's approval to use any techniques not listed above prior to incorporating them into the Project.

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8.3.3.4 Ground Improvement Techniques

The following techniques are pre-Approved for use on the Project to improve foundation soil conditions and address potential settlement issues:

- Soil reinforcement with geosynthetic materials
- Prefabricated vertical drains (PVD) or vertical strip drains (VSD)
- Soil preloads and/or surcharge loads
- Staged construction
- Stabilizing counter-berms
- Column-supported embankments or column-supported foundations (use of rigid inclusions and load transfer platform for foundation support)
- Deep mixing methods (soil mixing)
- Micropiles and reticulated micropile systems
- Compacted stone columns or aggregate piers

Use of the above techniques is dependent on analyses to confirm that technique is appropriate and can resist the loads which will be applied, and Department concurrence with the analysis results. Obtain WisDOT approval to use any techniques not listed above prior to incorporating them into the Project.

Follow the guidelines presented in the FHWA publications on ground improvement techniques.

8.3.3.5 Embankment Stability Performance Criteria

- Embankment stability will be checked at Service 1 limit state using appropriate load combinations and resistance factors in accordance with the WisDOT Geotechnical Manual and Chapter 14 of with WisDOT Bridge Manual.

Design slopes and embankments to accommodate a 100-year flood event with consideration for surface erosion, any potential undermining scour, inundation, and rapid drawdown.

8.3.3.5.1 Reinforced Embankments and Slopes

Provide slope face (secondary) reinforcement for erosion control and surficial stability for all slopes steeper than 2:1 (Horizontal:Vertical [H:V]).

Provide structural (primary) reinforcement and slope face (secondary) reinforcement for all slopes steeper than 1:1.

Embankments steeper than 0.4:1 will be designed as Mechanically Stabilized Earth (MSE) walls in accordance with WisDOT requirements.

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Provide base and/or internal reinforcing for all embankment systems where large settlement is predicted, and shear at the base of, or within, the embankment system could otherwise cause internal tension cracks.

8.3.3.5.2 Bridge Foundation Embankments and Slope Treatments

Slopes up to 2:1 are allowed directly in front of each bridge abutment, bridge pier, or any walls that are not wingwalls. The slopes must transition to 3:1 or flatter no later than the end of any wingwall(s) or 200 feet from the installation, whichever is greater.

Slopes up to 1.5:1 are allowed for riprap at stream crossings.

8.3.3.6 Embankment Lateral Deflection Criteria

Ensure that embankments are stable with respect to lateral deflection. Design lateral deflection to be less than 3 inches of deformation as measured from the center of the embankment to the embankment toe or wall serving as the free-end of an embankment. The lateral deflection measurement period will begin when embankment construction is complete.

8.3.3.7 Embankment and Slope Settlement Criteria

TBD

8.3.3.8 Bridges, Wall, and Box Culvert Settlement Criteria

Design foundations so that total settlement of bridge foundations after beam installation does not exceed tolerances established in Section 13 (Structures).

Design walls so that settlement criteria meets the requirements of Chapter 14 of the WisDOT Bridge Manual.

Design box culverts so that their total calculated settlement is 2 inches or less after the culvert is backfilled to finished grade.

Design reinforced soil slopes (RSS) so that their total calculated settlement is 2 inches or less after the RSS is backfilled to finished grade.

Ensure that other design criteria, such as acceptable settlement tolerances for pavement or other structures built above these works, are accommodated in design.

8.3.3.9 Utility Requirements for Driven Piling Installation

For driven piling within 10 feet clear distance of any Utility or storm sewer, pre-bore to a depth at least 10 feet below the bottom elevation of each Utility or storm sewer. Pre-bore for piling in accordance with the WisDOT Standard Specifications.

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8.3.4 Reports and Plans

8.3.4.1 Vibration Monitoring and Control Plan

Develop, implement, and maintain a documented Vibration Monitoring and Control Plan. The principal components of the Vibration Monitoring and Control Plan are: (1) Susceptibility Study, to include an assessment of the potential for damage to buildings and impacts to sensitive operations and equipment near the Project due to vibration-producing activities; (2) Pre-construction Survey, to include a pre-construction condition survey of nearby buildings and structures to document their condition prior to construction activity; and (3) Vibration Monitoring Approach, to include locations of vibration monitors, number of monitors, maximum vibration limits, and communication and reporting processes to control excessive vibration levels.

Address the potential impacts to nearby receptors due to construction or demolition activities associated with this Project in the Vibration Monitoring and Control Plan. The term “receptor” as used in this document includes buildings, structures, Utilities, Utility service connections, sensitive operations/processes, and occupants.

Vibration-producing activities on the Project are not allowed until monitoring equipment is successfully installed per the Approved Vibration Monitoring and Control Plan and the pre-construction Building Condition Report(s), Sewer Condition Report(s), and Structures and Pavement Report(s) are submitted to the Department. Submit the Vibration Monitoring and Control Plan, an electronic copy of each notification letter issued, and vibration monitoring records. Report immediately any violation of vibration limits.

8.3.4.1.1 Susceptibility Study

- Develop a list of all anticipated vibration-producing activities and where they are expected to occur.
- Develop a list and map all potentially impacted receptors per Exhibit 8-B. At a minimum, the following must be included:
  - [Add items as needed]
  - [Add items as needed]
- Provide a vibration susceptibility analysis for each identified receptor to the Department and receptor owner, and establish vibration control limits to preclude damage or undue annoyance to each of the identified receptors.

8.3.4.1.2 Preconstruction Survey

Perform a Preconstruction Survey to document the existing condition of each receptor defined in Exhibit 8-B per the requirements of Exhibit 8-C.

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8.3.4.2 Site Investigation Report

Prepare the SIR following the requirements found in Chapter 10 of the WisDOT Bridge Manual and the following:

- An independent SIR will be prepared for each Structure proposed along the alignment of the Project.
- Include analysis and supporting calculations in the Geotechnical Analysis section of the SIR for the following:
  - Stability, settlement (including both rates and magnitudes), and lateral and axial deformation
  - Long-term performance (such as long-term considerations associated with geosynthetic materials, corrosion, creep, etc.)
  - The low-unit weight, buoyancy, and compressibility of certain lightweight fills if used
  - Soil separation, permeability, seepage performance, and filter design where applicable
  - Relevant calculations related to changes between or among different types of foundations and structural systems if multiple systems are used, creating interfaces where differential settlement or deformation may be problematic
  - Interaction of existing embankments and new embankments where new fill is added
  - Waiting periods or construction sequencing requirements associated with consolidation settlement or construction using materials that require time to cure or gain strength.
- Include graphics that clearly depict soil information with respect to proposed foundations or constructed works. Plot borings on cross-sections or profiles for bridges, retaining walls, culverts, reinforced soil slopes, slopes, embankments, and other works requiring an SIR. Clearly show the elevations of proposed improvements with respect to borings, soundings, and other investigation data in drawings within the SIR. Plot to a reasonable and legible scale and include boring numbers, elevations, and content necessary to easily review proposed works in context with stratigraphy and material properties.
- Include clearly defined dimensions and detailed drawings for linear, area, or volume features described in the SIR, including:
  - Soil subcut, removal, and excavation dimensions
  - Preload and surcharge earthwork dimensions
  - Extent of ground improvement or specialty construction (e.g., load transfer platforms).
- Develop any necessary technical specifications, critical activity point requirements, staging requirements, or additional QA/QC Project requirements for the successful implementation of specialty geotechnical Work.

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The Department will respond within 10 Working Days of receipt of each SIR. Additional time and coordination may be necessary based on the size and complexity of a Project. Ensure that appropriate development time, including over-the-shoulder reviews for both SIR documents, is accommodated in the Project CPM Schedule.

The Department will not Accept RFC Plans for reinforced soil slopes, retaining walls, column supported embankments, or structures without first having an Accepted SIR for the item being submitted for RFC.

8.3.4.3 Additional SIR Requirements

Additional design analysis is required if, during construction, an unexpected soil or rock failure (e.g., bearing capacity lower than predicted, lateral squeeze stability not as predicted, slope failure, damage to unfinished construction due to rainfall events, or excessive deformation of temporary sheeting and shoring causing damage to constructed Work or private property) occurs. The results of the analysis and supplemental site investigation and design changes should be documented in an SIR meeting the previously defined report requirements and be submitted for the Department's review.

The analysis may require additional soil borings or geotechnical exploration in cases where damage or distress impacts planned permanent structural works, slopes, or pavement, depending on the severity of the issue and the proposed remediation. In cases where significant and unanticipated deformation occurs, additional monitoring may be required to evaluate the performance of the solution depending on the nature of the remediation.

8.3.4.4 Depicting Geotechnical Works on Project Plan Sheets

Include design drawings that adequately detail geotechnical works for construction in the Project plans to ensure appropriate construction of these features. References in RFC plans to the SIRs are not sufficient to adequately describe the Work.

Show dimensions in plan and profile view for such features as subcut soils, surcharges, excavations, reinforced soil areas, and inclusions (such as geofoam or lightweight fills) to be shown in plan and profile view.

Plan notes must clearly detail material types and items important to the successful construction of the geotechnical works (e.g., direction of geosynthetics, timing, or sequencing requirements).

8.4 Construction Requirements

8.4.1 General

Conduct all Work so as to prevent damage to adjacent utilities, buildings, roadways, and structures; to avoid interruption of their operations; and to prevent undue annoyance to their occupants or users.

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- Do not damage adjacent infrastructure or property; show no damage has occurred from Contractor operations, such as dewatering operations, temporary excavations, temporary sheeting or shoring, or use of vibratory equipment, by providing pre-construction and post-construction condition reports.
- Damage identified in the post-construction condition report that was not present in the pre-construction condition report must be repaired by the Contractor to a condition Approved by the Department at no additional cost to the Department.

8.4.2 Construction Criteria

8.4.3 Materials/Testing Requirements

Provide an electronic copy of completed soil lab test data as part of the supplemental subsurface investigation to the Department.

Transmit to the Department gINT software boring logs for all completed borings, using the Department's gINT template (contact Dan Reid for the template, 608-246-7946). Send these to the following email location at the time of RFC submittal: DOTDTSDGeotechnicalgINT@dot.wi.gov.

Transmit to the Department all soils laboratory testing summary and testing data sheets for tests performed on the soil and rock samples collected during the investigation. In addition, transmit the results of any field tests including vane shear tests, pressure meter tests, and cone penetrometer tests. Send this in a .pdf format that references the Department's design Project I.D. to the followings email location at the time of RFC submittal: DOTDTSDGeotechnicalSirLab@dot.wi.gov.

Transmit to The Department all Soil Reports relating to structures, roadways, pavements, and environment. Send this in a .pdf format that references The Department's design Project I.D., and send them to the followings email location at the time of RFC submittal: DOTDTSDGeotechnicalSirLab@dot.wi.gov.

8.4.3.1 Vibration Monitoring Requirements

Monitor construction-related vibrations, maintain records of all vibration-producing activities for which vibration monitoring is required, and perform a post-construction survey in accordance with Exhibit 8-E.

8.5 Deliverables

Table 8-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

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Table 8-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Subsurface Investigation Plan	Acceptance	8.3.2.1
Foundation boring and other exploration logs (including exploration geophysical reports)	Acceptance	8.3.2, 8.3.2.1, 8.3.4.3
Soil Lab Test Data	Acceptance	8.4.3
Site Investigation Report (SIR)	Acceptance	8.3.4.2, 8.3.4.3
Plan Depiction of Foundations Investigation	Acceptance	8.3.4.4
Vibration Monitoring and Control Plan	Acceptance	8.3.4.1
Notification letters (electronic format)	Acceptance	8.3.4.1
Vibration monitoring records	Acceptance	8.3.4.1
Condition Reports	Acceptance	8.3.4.1

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EXHIBITS

All exhibits are provided as electronic files.

Exhibit 8-A Foundation Boring Logs

Exhibit 8-B Susceptibility Study (attached)

Exhibit 8-C Pre-Construction Survey (attached)

Exhibit 8-D Vibration Monitoring Criteria (attached)

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Exhibit 8-B Susceptibility Study

Prepare a Susceptibility Study to assess each building, structure, Utility, Utility Service Line, and other receptors with sensitive operations/processes and occupants in the survey area defined below and determine its susceptibility to disruption by vibration-producing Work. “Disruption” includes both cosmetic cracking (threshold damage) and impacts on sensitive equipment and its operation. Categorize the susceptibility of each building to cracking during Work as high, moderate, or low as defined below.

Susceptibility to cracking is the threshold of cosmetic cracking, which is:

- Threshold damage (e.g., opening of old cracks and formation of new plaster cracks, dislodging of loose structural particles such as loose bricks from chimneys)
- Architectural or minor damage that is superficial and does not affect the strength of the structure (e.g., broken windows, loose or fallen plaster, hairline cracks in masonry)

The categories of building susceptibility to vibration are:

- High susceptibility: An identified receptor has high susceptibility if it has already experienced a significant amount of degradation of its primary structural or nonstructural system, and additional vibrations may further degrade these elements and possibly result in injuries to persons in the building. Identified receptors with loose or unstable elements (such as loose bricks or structurally cracked terra-cotta cornices) are in this category.
- Moderate susceptibility: An identified receptor has moderate susceptibility if, although some building deterioration has occurred prior to construction activities, it has not yet experienced a significant degradation of its primary structure or its nonstructural systems that would lead to further building degradation due to construction vibrations. This category includes identified receptors with bricks that may be loose (as determined by visual inspection) and identified receptors with small to moderate quantities of fragile, potentially unstable contents that may be damaged by construction vibrations.
- Low susceptibility: An identified receptor has low susceptibility if it is not expected to experience cosmetic cracking when subject to moderate levels of vibrations (such as those permitted by the OSM vibration criteria) and if its contents will not be damaged by moderate vibration levels.

As part of the Susceptibility Study, determine whether there are sensitive operations or equipment nearby, such as hospitals, computerized industries or banks, and industrial machinery. Include a list of buildings with sensitive equipment or procedures in the Susceptibility Study.

The Susceptibility Study will include the three items listed below, which will be provided to the Department as part of the Vibration Monitoring and Control Plan.

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Anticipated Vibration-producing Activities

Identify locations where moderate to heavy construction activities will occur that are capable of producing vibrations that may cause damage, interference, or annoyance to receptors. Heavy activities include operations such as blasting, pile-driving, dynamic compaction, and percussive demolition. Moderate construction activities include operations such as vibratory compaction and heavy equipment operation. Present locations on a plan sheet or map that shows in-place topography, including nearby structures and buildings.

Potentially Impacted Receptors

Produce a map that includes the potential receptors established in this section. Identify receptors by type of construction, size, material, address (if applicable), and owner. Identify all receptors in the survey area and categorize them as high, medium, or low susceptibility. The survey area is defined as the area including:

- All buildings and structures within a distance at which vibrations of 0.1 inch per second or greater will occur from construction activities
- Any building that has sensitive operations or Utility that may be affected by vibration-producing activities

Establish Vibration Limits

Establish safe vibration levels that preclude damage to structures and are not vexatious to operations or occupants. Use these safe vibration levels as vibration limits for the Contract. Set separate levels for each receptor, if desired, but the limits may not be less stringent than those set forth in the OSM Alternative Blasting Level Criteria (Modified from Figure B1, RI 8507 U.S. Bureau of Mines). Express the vibration criteria in peak particle velocity with units of inches per second.

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Exhibit 8-C Pre-Construction Survey

Perform a Pre-construction Survey to document the existing condition of each receptor defined in accordance with Section 8.3.4.1 (Vibration and Monitoring and Control Plan) prior to beginning any Work that produces perceptible ground vibrations. As part of the survey, complete the following items.

Public Notification

Contact each household, institutional operator, Utility owner, structure owner, and business establishment identified as receptors in accordance with Section 8.3.4.1 (Vibration Monitoring and Control Plan). Notify each contact via a registered letter at least 2 weeks prior to the open house. Obtain confirmation of receipt of notification letter. Include the following, at a minimum, in the letter:

- Description of the proposed construction
- Explanation of the potential for producing vibrations
- Steps the Contractor will take to avoid potential damage from those vibrations
- Name and telephone number of a contact person to respond to any questions or concerns
- Description of the pre-construction survey, including probable date that the survey will be conducted
- Description of Vibration Monitoring Plan
- Invitation to the Open House

Hold an open house to discuss and educate the public about the Pre-construction Survey process prior to commencing surveys. At a minimum, communicate to the audience the information required in the letter. Staff the open house with enough personnel of sufficient expertise to fully answer questions from owners.

Condition Report

Buildings

Document the existing structural and cosmetic condition of each building identified as a receptor. Document conditions with digital photographs, videotape, and engineering sketches of each element of each building, including the following items:

- Interior subgrade and above-grade walls
- Floors
- Ceilings
- Roof

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- Visible exterior as viewed from grade level

Identify, in writing, each documented element by its relative location within the building. List the location of each building, the documentation of the existing conditions, and a description of any areas of concern. Include the following in the Building Condition Report:

- Name and address of person(s) contacted and telephone number (if known)
- Date letter was sent
- Location(s) and telephone number(s) of the building(s)

Provide the Department and the building owner with a copy of the Building Condition Report before commencing vibration-causing activities.

Utilities, Storm Sewers, and Culverts

Document the existing structural and cosmetic condition of utilities, storm sewers, and culverts identified as receptors. Document conditions with digital photographs, videotape, and engineering sketches of each element, including the following items at a minimum:

- Interior of pipe (cracks, fractures, loose or dislodged concrete liner, etc.)
- Joints (horizontal or vertical deflections or settlement, voids, leaks, etc.)
- Manholes, catch basins, or other appurtenances
- Headwalls

Identify, in writing, each documented element by its relative location along the sewer. List the location of the sewer, the documentation of the existing conditions, and a description of any areas of concern. Include the following in the Sewer Condition Report:

- Name and address of person(s) contacted and (if known) telephone number
- Date letter was sent
- Location(s) of the sewer

Provide the Department and the sewer owner with a copy of the Sewer Condition Report before commencing activities that could impact a sewer or culvert.

Structures and Pavement

Document the existing structural and cosmetic condition of the structures and pavements (lanes and shoulders) that are deemed receptors. Document conditions with digital photographs or videotape, measurement, and engineering sketches of structure or pavement, including the following items at a minimum:

- Cracks (width, length, quantity)
- Joints (separation, alignment)

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- Spalling or delamination

List the limits of the pavement area inspected, the documentation of the existing conditions, and a description of any areas of concern. Include the following in the Structures and Pavement Condition Report:

- Name and address of person(s) contacted and (if known) telephone number
- Date letter was sent

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Exhibit 8-D Vibration Monitoring Criteria

Monitor construction-related vibrations with Approved seismographs at the three most critical receptors within 300 feet of vibration-causing activities. In addition, monitor any vibration receptor within 500 feet identified as having high susceptibility. Monitor vibrations continuously during vibration-producing events. If the vibration level of any of the three components of the peak particle velocity exceeds the vibration limit, immediately cease the vibration-producing activity. Do not resume the vibration-producing activity until given written permission to do so by the Department.

Maintain records of all vibration-producing activities for which vibration monitoring is required, including:

- Location of the vibration-producing event
- Distance from the event to the monitoring Site(s)
- Maximum peak particle velocity

Immediately notify the Department and receptor owner when a violation of the vibration limits occurs. Stop the activity that produced the violation until permission to proceed is given in writing by the Department. Immediately submit a report to the Department that explains the conditions of the violation and the steps to be taken to reduce the vibrations to below the vibration limit. Based on this report, the Department will decide if permission to proceed with the construction activity will be granted.

Monitoring Equipment

Supply a suitable number of seismographs to cover monitoring requirements described above. Use seismographs capable of measuring, recording, and producing a printed paper version of the frequency and peak particle velocity in each of three mutually perpendicular axes. Equipment must also be capable of recording vibrations as a histogram: a peak reading over a selected period of time. The instruments must have an appropriate sampling rate and velocity range to measure vibration levels generally found in construction activities. Each vibration instrument must have current calibration documentation, which must remain current during the course of monitoring. Obtain the Department’s approval of all vibration monitoring equipment prior to use on the Project.

Vibration Damage Arbitration

The Department’s acceptance of the Vibration Monitoring and Control Plan does not guarantee that damage will not be caused by construction activities, nor does it relieve the Contractor from responsibility should damage occur. The Vibration Monitoring and Control Plan does not preclude receptor owners from claiming damage.

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If a receptor owner claims vibration damage anytime up to 1 year after Substantial Completion and the Contractor does not agree with those claims, schedule and attend an arbitration hearing with the receptor owner (subject to the receptor owner's agreement to use arbitration). The cost of the arbitrator will be borne by the Contractor. Advise the receptor owner, in writing, of the availability of the arbitration option, and that the Contractor will pay the arbitrator. Also advise the receptor owner that the Contractor cannot provide legal advice to the receptor owner, that the receptor owner should consider obtaining legal counsel, and that the receptor owner will be responsible for the costs of its own legal counsel.

Select an arbitrator from the list of arbitrators provided by the American Arbitration Association in accordance with the Association's procedures.

Post-Construction Survey

Conduct post-construction building, structure, Utility, sewer, culvert, and pavement condition surveys for all items that received a pre-construction survey. Include in the reports a description of any difference between the pre-construction survey and post-construction survey. Provide the survey report to the Department and bring to the Department's attention any occurrence of a receptor that experienced a difference in condition between the pre-construction and the post-construction survey. Post-construction surveys will, at a minimum, meet the requirements set forth for the pre-construction survey.

Movement-Related Damage to Adjacent Properties

Install instrumentation where necessary to monitor movements of structures, Utilities, and other features within the zone of influence of constructed embankments. For embankments, the zone of influence is defined as a zone extending a minimum horizontal distance (*H*) from the toe of the embankment, where *H* is the height of the embankment. For retaining walls, the zone of influence extends from the toe of the footing to a minimum distance of twice the height of the wall.

Include instrument readings in supplemental settlement monitoring reports, as readings become available, including monitoring done during and after construction.

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9 Land Surveying

9.1 General

Conduct all Work necessary to meet the requirements associated with land surveying, including secondary horizontal and vertical control surveys; mapping and subsequent topographic surveys; bridge, Utility, soils, construction, and as-built surveys; and all other land surveying services necessary not previously provided by the Department to complete the Project in an accurate, neat, and timely fashion.

9.2 Administrative Requirements

9.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to land surveying, follow the order of precedence set forth below unless otherwise specified:

- WisDOT *Facilities Development Manual, Chapter 9*
- State of Wisconsin Standard Specifications for Highway and Structure Construction
- Remaining standards set forth in Book 3

9.2.2 Meeting Requirements

With at least 5 Working Days' notice, either the Design-Builder or the Department may request meetings to discuss survey requirement issues and to assist the Design-Builder or its surveyor(s) in resolving any survey questions.

The Design-Builder will designate a Survey Manager for the Project and make this individual available to the Project offices during design activities and as needed on Site during design and construction activities.

9.2.3 Equipment/Software

9.2.4 Permits/Authorizations

9.3 Design Requirements

9.3.1 General

Conduct design surveys in accordance with the *FDM* and guidelines within this section.

The Department will perform or provide the following items:

- Centerline alignments and existing Right-of-Way limits

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- The location and coordinate values of the available horizontal and vertical control stations within the Project as shown in Section 9.3.3.1.2.

9.3.2 Investigations/Supplemental Work

9.3.2.1 Survey Data Provided to the Design-Builder

Access the Department's control network at https://www.ngs.noaa.gov/NGSDataExplorer/ for location and coordinate values of available horizontal and vertical control stations.

Verify and confirm the location, accuracy, and datum of all information provided, regardless of the source of the information. Document all forms of data verification. Report any discrepancy in writing to the Department for review. The Department will respond to the discrepancy within 10 Working Days.

9.3.3 Design Criteria

9.3.3.1 Survey Control Requirements

9.3.3.1.1 Survey Control Adjustments and Accuracy

Document the use of present survey control networks and the establishment of any subsequent survey control networks that will be used in conjunction with the Project. Include survey control monument locations, types, accuracy values, and establishment methods.

9.3.3.1.2 Survey Control Datum

For the Project's horizontal survey datum, use WISCRS [insert county name] NAD83 (2011) adjustment. For the vertical datum use NAVD88 (2012) adjustment. Subsequent data incorporated into the Project that did not originate in these accepted survey control datums may be adjusted to these accepted survey datums and used for the Project only if the integrity and accuracy of the survey data are not affected.

9.3.3.2 Preservation of Survey Monuments

9.3.3.2.1 Existing Survey Control Monuments

Locate and preserve all previously established survey control monuments located within the Project. Notify the Department in writing of all such survey monuments that will be disturbed as a result of the Project at least 30 days prior to their disturbance. Follow *FDM, Section 9-5-1*.

Geodetic Surveys Unit
866-568-2852
geodetic@dot.wi.gov

9.3.3.2.2 Public and Private Land Survey Monuments

Locate all previously established Public Land Survey System (PLSS) monuments and PLSS reference monuments as well as monuments marking property corners located within the

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Project construction limits, staging areas, or other areas used for Project purposes. Notify the Department's Project Manager and County Surveyor or designee in writing of all PLSS survey monuments or PLSS reference monuments that will be disturbed as a result of the Project at least 30 days prior to their disturbance. Replacement will be completed per County Surveyor or designee instructions.

Perpetuate the coordinate location of all known monuments marking property corners located along or within the R/W of the Project. In accordance with *FDM, Section 9-5*, replace all monuments disturbed as a result of the Project. Replacement will be completed under the direction of a Wisconsin licensed Professional Land Surveyor.

9.3.3.3 Design and Right-of-Way Surveys

9.3.3.3.1 Mapping

Conduct all tasks necessary to complete mapping for the Project. Include all planimetric, topographic, design, Utility, alignment, R/W, and base maps necessary to complete the Project not previously provided by the Department.

9.3.3.3.2 Right-of-Way Surveys

1. Temporarily mark existing right-of-way for coordination with affected utilities and property owners.
2. Locate the necessary section corners for the R/W plat. It is estimated that _____ section corners need to be located and established, and tied to state plane coordinates. Do not apply for reimbursement from the applicable county for these costs.
3. Conduct surveys that provide information necessary for the preparation of plats and acquisition of R/W and property. Provide R/W monumentation information. All such information will be provided in an electronic file in accordance with the FDM.
4. Tie surveys to section corners, quarter section corners, and to street lines or block corners in platted areas. Ties will be in sufficient detail to permit the preparation of proper legal descriptions of the lands acquired.

9.3.4 Reports and Plans

9.3.4.1 Survey Reports

Maintain neat and accurate documents for all survey operations conducted throughout the Project. Include all calculations, staking notes, and field crew daily diaries. Write a formal survey report for all survey calculations related to survey control networks, road alignments, property boundaries, and PLSS surveys. The intent of each report is to document and perpetuate the information and rationale used to determine the survey data that are part of the Project. Provide records to the Department at Project completion as shown in 9.3.4.2. Include information related to the source data used, the calculations performed, and the data produced as part of the

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survey process. The Department will provide the format specifications of each report type. Have a Professional Land Surveyor licensed in the State of Wisconsin review and sign each report.

Submit survey reports in electronic file format within 30 Days of the completion of each survey, exclusive to survey control networks, road alignments, property boundaries, and PLSS surveys.

9.3.4.2 Survey Report Deliverables

1. Submit all survey data (including description, measured, and computed data) to the Department in the AASHTO SDMS format, in accordance with the FDM. Copies of original notes or printouts from other systems that may be used in lieu of the SDMS Collector software will also be provided.
2. The Design-Builder will provide Highway Project Data in a digital format to the Department in accordance with the standards outlined in the FDM. All electronic Project data must be delivered to the Department on Read-Only CDs at various stages of the Project as specified here or *<at PS&E> or <after final review> or <upon termination of the contract> or <give a specific date based on need for data before TOTAL Project is complete>.* All electronic Project data must be accompanied by a meta-data document (format of meta-data provided by the Department) which describes all data that are delivered.
3. Upon receipt of the electronic data files, a Department representative will process the data within 6 weeks, and send a letter to the Design-Builder confirming that the data were received and verified to be in the correct formats. If the data received are not correct, the Design-Builder must rectify the problem and resubmit the data to the Department within 2 weeks of being notified of the problem. This confirmation letter does not certify that the electronic data submitted by the Design-Builder matches the information that is shown on the paper plan, nor does it verify that the design is valid and follows design standards set in the Facilities Development Manual. The confirmation letter in no way releases the Design-Builder from responsibilities related to the constructability and validity of the design.
4. The Design-Builder will provide field control information, including all data used to establish survey control in the field. At a minimum, the data will include all control points and section corner points. Control points must have a feature code of CP and section corner points must have a feature code of SEC. In addition, other field control data may be required at the discretion of the Project Manager. Other field control data must also be assigned a standard WisDOT feature code. The format of the file containing field control information will be in accordance with the standards outlined in the FDM.
5. The Design-Builder will provide reference line information, including all mainline and side road reference lines and the project control necessary to establish such reference lines. All proposed alignments must be assigned a feature code of PRL, and all existing alignments must be assigned a feature code of CL. In addition, for each alignment, a report of the alignment/reference line details (bearings, curve data, etc.) will be provided.

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The format of this report is provided in the FDM. The format of the file containing reference line information will be in accordance with the standards outlined in the FDM.

6. The Design-Builder will provide data necessary for the preparation of plats and acquisition of R/W and property, including all existing and proposed R/W chains and points to be staked. The format of the file containing R/W monumentation information will be in accordance with the standards outlined in the FDM.
7. The Design-Builder will provide design profile information, which includes profiles of any reference lines, driveway profiles, and any necessary ditch profiles. The format of the file containing profile information will be in accordance with the standards outlined in the FDM.
8. The Design-Builder will provide existing cross section data for the Project. At a minimum, the existing ground surface, the finished ground surface outside the subgrade shoulder points, and the finished ground surface between the subgrade shoulder points must be provided, with the information for each surface placed in its own file. At the discretion of the Department, additional surfaces such as (but not limited to) rock, marsh, or select subgrade material may also be requested at no additional cost. Names of the surfaces in all cross-section files must follow those standards set in the WisDOT standard feature table. The format of the file containing existing cross-section data will be in accordance with the standards outlined in the FDM.
9. The Design-Builder will provide existing surface data. The format of the existing surface data will be in accordance with the standards outlined in the FDM.
10. The Design-Builder will provide information on the locations of the super-elevation transition points along alignments <*name alignments here*>. The format of the super-elevation information will be in accordance with the standards outlined in the FDM.
11. The Design-Builder will provide existing topographic data that are classified as utility information. WisDOT standard feature codes and point connectivity methods must be used in the data files submitted. The format of the topographic data will be in accordance with the standards outlined in the FDM.
12. The Design-Builder will provide existing topographic data that are classified as other than utility information. WisDOT standard feature codes and point connectivity methods must be used in the data files submitted. The format of the topographic data will be in accordance with the standards outlined in the FDM.
13. The Design-Builder will provide other Survey Information, as deemed necessary by the Department PM. The format of the miscellaneous survey information will be in accordance with the standards outlined in the FDM.
14. The Design-Builder will provide graphical data files for the following <*examples include preliminary design, r/w plats, complete plan sets, etc.*>. All graphical files will be in accordance with the data exchange and CADDS standards outlined in the FDM.

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9.4 Construction Requirements

9.4.1 General

Perform all surveying necessary to facilitate construction operations for the duration of the Project in accordance with Standard Specifications Sections 105.6 and 650.

9.4.2 Construction Criteria

9.4.3 Materials/Testing Requirements

9.4.4 Instrumentation/Monitoring Plan

9.5 Deliverables

Table 9-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 9-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Survey reports	Acceptance	9.3.4.1
Survey records	Acceptance	9.3.4.1

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10 Pavements and Roadway Materials

10.1 General

This section describes the requirements for concrete and hot-mix asphalt (HMA) pavements and roadway Materials, including soil investigations, Materials requirements, design requirements, and all other Work necessary to meet the requirements of the Project.

10.2 Administrative Requirements

10.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 and RID relating to pavements and roadway Materials, follow the order of precedence set forth in WisDOT Standard Specifications for Highway and Structure Construction 105.4 and below, unless otherwise specified:

- WisDOT *Facilities Development Manual (FDM) Chapter 14: Pavements*
- *WisPave 4 User Manual*
- WisDOT *Geotechnical Manual*
- WisDOT *FDM Chapter 11: Design*
- WisDOT *Construction and Materials Manual (CMM)*
- WisDOT *FDM Chapter 16: Standard Detail Drawings Series 13 Pavement Design*
- AASHTO *Manual on Subsurface Investigations*
- AASHTO Laboratory Specifications
- FHWA Publications
- AASHTO Task Force 27 Report—In Situ Soil Improvement Techniques
- AASHTO Standards
- ASTM Standards
- Other standards set forth in Book 3

10.2.2 Meeting Requirements Not Used

10.2.2.1 Roadway Boring Requirements

Refer to the WisDOT *Geotechnical Manual to* determine the number and type of additional soil borings and tests, if any, required to assess the soil conditions for pavements and roadway materials.

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10.2.2.2 Soils Materials/Testing Requirements

If additional major soil types (textural classes) are encountered during construction that were not identified in the soils report, take at least two representative samples of each additional major soil type (textural class) encountered. Retain, test, and compile data on samples.

Perform laboratory soils tests of sufficient number and type to ascertain the nature, strength, conditions, stability, and consolidation characteristics of soil conditions existing at the Site that influence the proposed design and construction activities. At a minimum, perform the following laboratory tests: Atterberg limits, particle size (percent sand, silt, and clay), R value, organic content, and Proctor density.

Compile all completed lab test data in an electronic document for submittal to the Department.

10.2.2.2.1 Pavement Design Requirements

Construct pavement types and minimum thicknesses as shown in Table 10-1 and as identified on the Preliminary Design Drawings. If additional major soil types (textural classes) are encountered during construction that were not identified in the soils, consult the Regional Pavement Design Engineer for any pavement layer thickness changes or subgrade stabilization recommendations.

Table 10-1: Pavement Sections

Location	Detailed Description	Pavement Layer Description	Minimum Thickness (inches)
Mainline		Concrete Pavement	
		Base Aggregate Dense	
		Select Crushed Material (1)	
		Granular Backfill (1)	
		HMA Pavement	
Axillary/Turning Lanes			
Shoulders			
Sidewalks		Concrete Sidewalk	
[Trails/shared-use paths]		Surface Type	
[Medians/islands]		Surface Type	
[Maintenance crossovers]			

NOTES:

1. Extend Select Crushed Material, or Granular Backfill material layers to shoulder points. Extend relief trenches to in-slopes to drain subgrade. Do not cover relief trench outfalls with Salvaged Topsoil or Topsoil per Standard Specification 625. See Section 10.3.3.

10.2.2.2.2 Local Roadways and Standards

When roadways and driveways adjacent to the Project are disturbed by construction activities, match the in-place surface type and structure of the existing roadways or driveways, unless otherwise specified.

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Avoid differential settlement for all pavement tie-ins, and account for total surfacing thickness, minimum structural requirements, unbound base/subbase thickness, frost-free characteristics, and other appropriate factors.

10.3 Construction Requirements

10.3.1 General Construction Requirements

Construct roadway embankment fill placed under this Contract meeting the requirements of Standard Specification 205 Roadway and Drainage Excavation, 207 Embankment, and 208 Borrow. Provide Borrow, Excavation Common, Select Borrow, or Excavation Rock for all new embankment and embankment-widening Material.

Construct base and subbase material following Standard Specification 211, Preparing the Foundation, and meeting the requirements of Standard Specifications 301 Base, Subbase, and Subgrade Aggregate 305 Dense-Graded Base, 310 Open-Graded Base, 311 Breaker Run, 312 Select Crushed Material, 313 Pit Run, 315 Asphaltic Base, 320 Concrete Base, 325 Pulverized and Re-laid Pavement, 330 Milled and Re-laid Pavement, 335 Rubblized Pavement, 340 Cracked and Seated Pavement, 350 Subbase, and 390 Base Patching.

Ensure that the depth of all gutter pans adjacent to concrete pavement matches the thickness of the adjacent concrete pavement.

10.3.2 Test Rolling

When connecting new surfacing adjacent to any existing pavements to be widened, saw-cut vertically to the bottom of the existing surfacing or to the bottom of the new surfacing design, whichever is deeper; then saw-cut at a 10:1 (H:V) slope to the bottom of the recommended subgrade excavation.

When connecting to existing roadways at the termini of proposed construction, saw-cut vertically to the bottom of the existing surfacing or to the bottom of the new surfacing design, whichever is deeper, then at a 10:1 (H:V) taper to the bottom of the recommended subgrade excavation. Where matching in-place crossroads, cut vertically to the bottom of the in-place surfacing, then at a 4:1 (H:V) slope to the bottom of the recommended subgrade excavation.

Provide for 10:1 (H:V) tapers when changing sub-cut depths.

Provide for 10:1 (H:V) tapers when changing subgrade Materials.

Provide a saw cut where placing new pavement next to in-place pavement to ensure a uniform joint.

Perform test rolling on the bottom of sub-cuts and the top of the subgrades in accordance with Standard Specification 205.3.13.

The embankment must be constructed in accordance with Standard Specification 207. Use backfill behind abutment walls for bridges and retaining walls that consists of Structure Backfill

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meeting the gradation requirements in Standard Specification 210.2.2. For placement and compaction of the backfill, comply with Standard Specification 206.3.13.

10.3.3 Pavement Section Drainage

When required, drain new subsurface pavement layers by either daylighting materials to in-slopes or adding subsurface drainage. If subsurface drainage is used, design and construct subsurface pavement section drainage compliant with the requirements of Section 12 (Drainage) and the following:

- Daylight the bottom of the drainage layer a minimum of 1 foot above the bottom of the ditch. Ensure that topsoil is excluded from the finished surface in these areas.
- Place subsurface drain outlets a minimum of 1 foot above the flowline of the ditch.
- Place subdrains a minimum of 1 foot above the normal high-water level of the water table.
- Place headwall outlets a minimum of 1 foot above the bottom of the ditch.

10.3.3.1 Concrete

10.3.3.1.1 Concrete Mix Design

Produce concrete mix designs following mix design procedures stated in Standard Specification 501 as required for the type of concrete used.

10.3.3.1.2 Concrete Construction and staging

Construct concrete pavements in accordance with applicable sections of the CMM section 400, Standard Specifications section 400, FDM Chapter 14, and SDDs.

10.3.3.2 HMA

Construct HMA pavements in accordance with applicable sections of the CMM section 400, Standard Specifications section 400, FDM Chapter 14, and SDDs.

10.3.3.2.1 HMA Mix Design

Produce HMA mix designs following mix design procedures stated in Standard Specification 450 as required to produce asphaltic pavements specified in Table 10-2.

10.4 Deliverables

Table 10-2, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Contractor’s responsibility to determine and submit all Deliverables, as required by the Contract.

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Table 10-2: Non-exhaustive List of Deliverables

Name	Approval	Section Reference
Supplemental Laboratory Testing Data	Approval	10.2.2.2
Concrete Mix Design	Approval	10.3.3.1.1
HMA Mix Design	Approval	10.3.3.2.1

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11 Roadways

11.1 General

11.2 Administrative Requirements

11.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to roadways, follow the order of precedence set forth below, unless otherwise specified:

11.2.1.1 State Trunk Highway System (including Interstate Freeways/Expressways and US Highways)

- Basic Configuration (30 percent plans) provided by the Department
- The Department's FDM, Chapter 11
- Remaining standards set forth in Book 3.

11.2.1.2 Local Roads

Meet county highway and local road criteria provided by the local governing agencies unless otherwise specified in Book 2.

11.2.2 Meeting Requirements

11.2.3 Equipment/Software

11.2.4 Permits/Authorizations

11.3 Design Requirements

11.3.1 General

11.3.2 Investigations/Supplemental Work

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11.3.3 Design Criteria

11.3.3.1 Clear Zone

Identify and correct clear zone deficiencies on mainline and ramps for state trunk highways within the Project limits where new construction is performed, unless otherwise specified.

On local roadways, meet the local clear zone/recovery area standards, unless otherwise specified.

Prior to submitting any roadway RFC packages, prepare a plan view that graphically displays proposed clear zone limits for that RFC package. Identify all hazards, both within the clear zone and in a 5-foot band outside each clear zone. A Roadside Hazard Analysis (RHA) will be completed in accordance with FDM 11-45-20. Hold an over-the-shoulder review with the Department, as described in Section 5 (Quality Management), and discuss whether actions are necessary to remove or protect any of the hazards. Upon completion of the process, update the RFC Documents as necessary.

The following calculated clear zone deficiencies have been preapproved by the Department and will be allowed on the Project. These preapproved deficiencies relate to clear zones only and do not allow any deviation to “lateral offset to obstruction,” “lateral clearance,” or other such requirements in the Book 3 standards.

Table 11-1: Preapproval of Clear Zone Deficiencies

Roadway	Location	Barrier Required
[EXAMPLE I-35E]	[Bridge pier at station 100+00 left may be within the clear zone and at a minimum of 25 ft. from the edge of traveled lane.]	Yes
[EXAMPLE Maryland Ave]	[Maryland inslopes are a hazard and within the clear zone from station 100+00 to 200+00]]	No

11.3.3.2 Vertical Curves

Apply the minimum vertical curve length defined in Section 11-10-5.4.2 of the FDM to vertical curves on State Trunk Highways. Define the minimum allowable vertical curve for all other roads by stopping sight distance.

11.3.3.3 Grades

The maximum grades for roadways are provided in FDM 11-10 (Attachment 5.3) and FDM 11-15 (Attachment 1.4).

11.3.3.4 Miscellaneous

For interstate highways, consider the ramp gore part of the mainline pavement.

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Follow the Project-specific design standards for specific roadways shown in the following tables. The ramp design speed referenced in the following tables is for the first curve on an exit ramp and the last curve on an entrance ramp unless otherwise specified.

Table 11-2: Project-Specific Design Standards for Roadways

Design Standards	**Roadway Name: _____**
Federal Oversight Project	☐ Yes ☐ No
Roadway Type	☐ IH ☐ USH ☐ STH ☐ CTH ☐ Local
Jurisdictional System	☐ State ☐ County ☐ Town ☐ Municipal ☐ Tribal
Highway Type	☐ Rural ☐ Urban
Functional Classification	☐ Principal Arterial ☐ Minor Arterial ☐ Collector ☐ Local
Corridors 2030	☐ Backbone ☐ Connector ☐ None
NHS Route	☐ Yes ☐ No
Long Truck Route	☐ Federal ☐ State ☐ None
Access Control	☐ Tier 1 ☐ Tier 2A ☐ Tier 2B ☐ Tier 3 ☐ Tier 4
Bicycle/Pedestrian Plans	☐ Bicycle ☐ Pedestrian ☐ None
Terrain	☐ Level ☐ Rolling
Design Criteria Application	☐ S-1 ☐ S-2 ☐ S-3
Improvement Strategy	
Design Class	
Median type	
Design Vehicle	
AADT— (current year)	
AADT— (design year)	
Posted speed	
Design speed	
Shoulder bus use	
Ramp Metering	See Section 17, ITS
HOV bypass lanes	☐ Yes ☐ No ☐ N/A
Special Features:	

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11.3.3.5 Intersections

If the Design-Builder proposes to add a new intersection that is not designated in the Basic Configuration or to modify an intersection type that is designated in the Basic Configuration, submit an Intersection Control Evaluation (ICE) report for acceptance that conforms to FDM 11-25-3 for each new or modified intersection.

The geometric layout will undergo a review by the Department and is subject to their approval. See Book 2, Section 5.4.9.4.1 regarding review timeframes. Print and distribute the final layout for signature following approval.

If the Design-Builder proposes to add a new interchange that is not designated in the Basic Configuration or change an interchange type that is designated in the Basic Configuration, follow the above requirements for each intersection in the interchange and obtain approval of the interchange type from the Department.

If the Design-Builder proposes to construct a roundabout intersection that is not designated in the Basic Configuration, follow the requirements of FDM 11-26 prior to submitting the layout for Level 1 review.

11.3.3.6 Slopes

Round slopes on the Project so that they tie naturally into adjacent slopes or the existing ground line. No slopes steeper than 1:3 (V:H) are allowed on this Project unless otherwise described elsewhere in Book 2. Steeper slopes listed as preapproved by the Department can be incorporated into the Work.

Design slopes to eliminate the need for traffic barrier, unless otherwise Approved by the Department or allowed in Book 2. Evaluate if any portion of a fill slope prior to the toe of slope is not recoverable, even beyond the clear zone, to determine if there is a hazard at the bottom of the slope, such as a deep pond or other hazards, which would require a traffic barrier.

11.3.3.6.1 Slopes Beyond State Right-of-Way

Design grading slopes that tie into property beyond the permanent R/W to be 1:6 (V:H) or flatter, except in the following locations.

Table 11-3: Allowable Grading Beyond R/W Steeper than 1:6 (V:H)

Property	Allowable Grading Condition
Parcel [___]	1:4 slopes may be used from permanent R/W line to existing ground.
Parcel [___]	1:3 slopes may be used from permanent R/W to existing ground in the following location(s): _____.

11.3.3.6.2 In-slopes on Roadways

Design in-slopes on rural roadways in accordance with FDM 11-15-1.11, and on urban roadways in accordance with FDM 11-20-1.8.

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The Department has pre-approved steeper roadway in-slopes at the following locations:

Table 11-4: Pre-approved Roadway In-slopes

Roadway	Allowable In-slope
I-35E	[Example]1:3 in-slopes are allowed in the following locations: __ to ___ ___ to ___ 1:4 in-slopes are allowed in the following locations: ___ to ___

Section 8 (Geotechnical) describes how to transition from structures to slopes.

11.3.3.6.3 Other Slopes

The Department has preapproved steeper slopes at the following locations:

Table 11-5: Pre-approved Slopes Steeper than 1:3 (V:H)

Roadway	Slope
Maryland Ave	[Example]1:2 slopes are allowed from stations: 50+00 to 75+00
I-35E	[Example]1:2 slopes are allowed from stations: 100+00 to 200+00 550+00 to 600+00

Section 8 (Geotechnical) describes how to transition from structures to slopes.

11.3.3.7 Roadside Design

All roadside design must follow FDM 11-45.

11.3.3.8 Snow Storage

On state trunk highways, excluding bridges, provide a minimum 10-foot-wide snow storage area between the shoulder and toe of backslope in cut sections. This area may be turf and may be any FDM compliant cross-slope draining away from the roadway adjacent to the outside shoulder.

On state trunk highways, excluding bridges, provide a minimum 10-foot-wide snow storage area between the shoulder and objects that can be damaged by thrown snow. Objects that can be damaged by thrown snow include vehicles on adjacent roads, control cabinets, and buildings.

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Table 11-6: Exceptions to Snow Storage Width Requirement

Minimum Width	Location
10 feet	(Example) Maryland N.E. Ramp—NWALLH1 from Maryland Ave to East Hyacinth Avenue
3 feet	(Example) Front face of curb along Mississippi Street—NWALLH1 from East Hyacinth Avenue to just south of Arlington Avenue
6 feet	(Example) Front face of curb along Mississippi Street—NWALLH2 from north of Arlington Avenue to East Hoyt Avenue
10 feet	(Example) L'Orient Road—NWALLI1 from north of Arlington Avenue to south of L'Orient Road and Wheelock Ramp A intersection

11.3.3.9 Fencing

Remove and replace R/W fence that is damaged or disturbed by the Design-Builder with standard Department fencing materials that match the existing fence material type and coating. Install R/W fence 3 feet inside permanent R/W, except as needed to isolate the trunk highway from the local roadway system and as Approved by the Department.

Protective screening systems on bridges will conform to FDM 11-35-1.8 and WisDOT Bridge Manual 30.6.

11.3.3.10 Cross-Slope

- Cross-slopes will conform to FDM 11-15-1.

Crown Locations

Design divided highways with depressed rural medians and a crowned cross-section for each roadway on each side of the median. Design roadways with raised medians and a crowned cross-section for each roadway on each side of the median, except as noted. Provide unidirectional cross-slopes at the following roadways and an accepting slope curb and gutter at the high side of these cross-slopes with catch basins to collect drainage:

- Roadway 1
- Roadway 2
- Roadway 3

11.3.3.11 Mailbox Requirements

Mailboxes are discussed in FDM 11-45-20-3.5.2; designer handling of hazardous mailboxes is provided in FDM 11-15-1. The responsibilities of the engineer, Design-Builder, and property owner are detailed in CMM 3-15.5, as along with the processes to be followed.

11.3.4 Reports and Plans

11.3.4.1 Design Justifications

Design all the elements associated with mainline highway and other roadways in accordance with the design criteria established in the Contract Documents. Develop a Design Justification in

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accordance with FDM 11-1-20 for any element that falls outside of design criteria for both controlling and non-controlling criteria. Controlling criteria on Department projects are established as per FDM 11-1-20.3.

There is no assurance that Design Justifications created by the Design-Builder will be Approved by the Department. If the Design-Builder's design creates Design Justifications, demonstrate on a case-by-case basis that substantial benefits to the Project and the public would result from the recommendation. Any justifications requested will be subject to Department approval prior to release of RFC Plans. Comply with the Design Justification process per FDM 11-1-20.

The following known Design Justifications have been Approved and can be incorporated into the Work, but the Design-Builder may consider eliminating them through design:

- Justification 1

11.3.4.2 Alignment and Profile Design Package

Submit all alignments and profiles for acceptance as a design package. Include alignment plans, tabulations, profile sheets, and computer output. Obtain acceptance for the alignment and profile design package prior to submittal of any design packages that use those alignments and profiles.

11.3.4.3 Design Study Report

Develop and submit for review and approval by the Department a Design Study Report for the Project in accordance with FDM 11-4-10.

11.3.4.4 Borrow Site Memorandum

TBD.

11.4 Construction Requirements

11.4.1 General

Remove all existing pavement, curb and gutter, sidewalk, trails, steps, drainage facilities, soil, rock, and other obstructions within the Project limits necessary to construct the Project. Remove all other unused pavements and sidewalks, including temporary facilities, within the Project Site, and grade to match the adjacent grading. When removing such items, saw-cut pavement or sidewalk with neat lines at the removal terminations.

11.4.2 Construction Criteria

11.4.2.1 Mining

TBD.

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11.4.2.2 Removal of Miscellaneous Objects

Remove and properly dispose of all objects encountered within the R/W that are not otherwise designated for removal, salvage, or reuse, such as abandoned automobiles, furniture, appliances, garbage, and other waste materials.

Remove all concrete cable barrier post sockets, anchorages, unnecessary sign footings, and other subsurface concrete that no longer provides function.

11.4.2.3 Disposal of Materials

TBD.

11.4.2.4 Building Removals

11.4.2.5 Protection of Other Facilities

11.4.3 Materials/Testing Requirements

11.4.4 Instrumentation/Monitoring Plans

11.5 Deliverables

Table 11-7, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 11-7: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Clear Zone Exhibit	Acceptance	11.3.1.3
Modification of a New Intersection Type	Approval	11.3.1.5
Roundabout Design Package	Acceptance	11.3.1.5
Design Justification	Approval	11.3.1.9
Alignment and Profile Design Package	Acceptance	11.3.1.10
Design Study Report	Approval	11.3.1.15
Borrow Site Memorandum	Acceptance	TBD
Mining Plan	Approval	TBD
Disposal Site Plan	Approval	TBD

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12 Drainage

12.1 General

This section identifies the design and construction requirements associated with temporary and permanent drainage and hydraulics, including culverts, storm sewer systems, bridges, roadway swales, permanent erosion and sediment control, structural pollution control devices, stormwater ponds, infiltration/bioretention features and other water quality control practices.

12.2 Administrative Requirements

12.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to drainage, follow the order of precedence as set forth below:

- WisDOT *Facilities Development Manual*
- WisDOT *Bridge Manual*
- WisDOT *Geotechnical Manual*
- WisDOT Transportation Construction General Permit (TCGP)
- *Cooperative Agreement Between Wisconsin Department of Natural Resources and Wisconsin Department of Transportation*
- Wisconsin DNR Standards Oversight Council (SOC) Stormwater Construction Technical Standards
- Wisconsin DNR Standards Oversight Council (SOC) Stormwater Post-Construction Technical Standards
- FHWA Hydraulic Design Series No. 5, *Hydraulic Design of Hydraulic Culverts*
- FHWA Hydraulic Design Series No. 7, *Hydraulic Design of Safe Bridges*
- FHWA Hydraulic Design Series No. 2, Second Edition, *Highway Hydrology*
- FHWA Hydraulic Design Series No. 3, *Design Charts for Open Channel Flow*
- FHWA HEC-11 Design of Riprap Revetment
- FHWA Hydraulic Engineering Circular No. 14 (HEC-14), *Hydraulic Design of Energy Dissipators for Culverts and Channels*
- FHWA Hydraulic Engineering Circular No. 15 (HEC-15), *Design of Roadside Channels with Flexible Linings*

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- FHWA Hydraulic Engineering Circular No. 17 (HEC-17), *The Design of Encroachments on Flood Plains using Risk Analysis*
- FHWA Hydraulic Engineering Circular No. 18 (HEC-18), *Evaluating Scour at Bridges*
- FHWA Hydraulic Engineering Circular No. 21 (HEC-21), *Design of Bridge Deck Drainage Systems*
- FHWA Hydraulic Engineering Circular No. 22 (HEC-22), *Urban Drainage Design Manual*
- FHWA Hydraulic Engineering Circular No. 23 (HEC-23), *Bridge Scour and Stream Instability Countermeasures: Experience, Selection and Design Guidance, Volumes 1 and 2*
- Remaining standards set forth in Book 3

12.2.2 Equipment/Software

Use spreadsheet output formats that are consistent with output described in the WisDOT *FDM Chapters 10 and 13*.

See Exhibit 12A for a list of acceptable software programs.

12.2.3 Permits/Authorizations

12.2.3.1 Coordination with Other Agencies and Disciplines

Coordinate all water resource issues with affected interests and WDNR. Submit the 401 Water Quality Certification and TCGP NOI as part of the RFC plans. Coordinate this Work with Section 4 (Environmental). The 401 water quality certification documentation coordination must include the following:

- Floodplains –DNR/DOT Cooperative Agreement Waterway Crossing and Encroachment Attachment
- Wetlands (Section 4)
- Habitat (Section 4)
- Navigation – DNR/DOT Cooperative Agreement Waterway Crossing and Encroachment Attachment and FDM 20-50-5
- Water Quality – Reference TRANS 401 and the TCGP and TS4 Permits
- Erosion Control (Reference Erosion Control Plans and Section 14)
- Aquatic Organism Passage (AOP)

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12.3 Design Requirements

12.3.1 General

Design facilities to be compatible with existing drainage systems adjacent to the Project and preserve existing drainage patterns wherever possible unless directed otherwise in this section or approved by the Department. Where drainage patterns must be changed from the existing, secure drainage easements and/or R/W as needed.

Design drainage to accommodate construction staging and provide drainage during all stages of construction. Update the Stormwater-Drainage-Water Quality Report with each stage and phase of construction.

12.3.2 Investigations/Supplemental Work

12.3.2.1 Data Collection

Water resource issues include areas with historically inadequate drainage (flooding or citizen complaints), Areas of Environmental Sensitivity, localized flooding, and maintenance problems associated with drainage and areas known to contain contaminated soil or water. Identify watershed boundaries, DNR-regulated public waters, county and jurisdictional ditches, areas classified as wetlands, impaired waters (based on TMDL), special waters, contaminated soil areas, groundwater table elevations where infiltration or bioretention is proposed, floodplains, and Wellhead Protection Areas. This includes the degree of vulnerability of each of these areas and of karst areas throughout the Project area. Acquire existing storm drain plans and survey data, including all data on culverts, drainage systems, drain tile, and storm sewer systems within the Project area. Determine existing drainage areas that contribute to the highway drainage system, and the estimated runoff used for design of the existing system.

Obtain additional photogrammetric and geographic information system (GIS) data for the Project area that depicts the outstanding resource value waters and impaired waters. Conduct surveys for information not available from the Department or other sources.

12.3.3 Design Criteria

12.3.3.1 Project-Specific Requirements

12.3.3.2 Stormwater Control Practices (SCPs)

12.3.3.2.1 Comply with the requirements in FDM Chapters 10 and 13:

12.3.3.2.2 Infiltration Basins and Bioretention Basins

Provide for pretreatment of runoff before it enters infiltration basins. Determine the pretreatment practice(s) using the WDNR SOC Stormwater Post-Construction Technical Standards.

Infiltration basins and bioretention basins cannot be used during construction as temporary sediment basins unless the initial elevation of the temporary basins is 0.5 foot higher than the

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final grade elevation, side slope vegetation is completely established, all sediment deposited during construction is removed, and the basin is subsoiled using a two-step deep subsoil and then surface tilling procedure. Protect infiltration and bioretention basins from compaction and sediment releases during construction.

Construct infiltration and bioretention basins according to the FDM and WDNR SOC Stormwater Post-Construction Technical Standards. Evaluate the infiltration rate of each infiltration basin using test pits or soil borings. Evaluate according to WDNR Technical Standard 1002.

Provide appropriate sediment control for slopes that drain to basins until stabilized with appropriate perennial vegetative covers.

12.3.3.2.3 Non-Structural Stormwater Control Practices

Do not use non-structural stormwater control practices such as catch-basin cleaning or street cleaning to claim TSS reduction credits unless there is an agreement in place with a local municipality to provide these practices.

12.3.3.2.4 Structural and Proprietary Stormwater Control Devices

Get the approval of the Statewide Stormwater Quality Engineer and the Statewide Drainage Engineer prior to developing the device design. The Department must approve the inspection/maintenance plan for each device approved by the Department.

12.3.3.2.5 Access to Stormwater Facilities

Provide a maintenance access route from a public roadway (a Department-owned roadway whenever possible) to the bottom of each stormwater storage and treatment facility. Ensure this access route is located entirely within the Department R/W, on the Department side of all noisewalls/fences, or a public right-of-way, access point, or easement as agreed upon with the local government authority. Construct the access with a minimum of 10 feet in width, and with a profile grade no steeper than 15 percent, with a preferred maximum of 12 percent. Provide a flat (1V:10H or flatter) maintenance bench at the lowest outlet invert elevation that is at least 10 feet wide and 30 feet long. Do not construct slopes steeper than 1:4 (V:H) between the inner edge (stormwater facility side) of the maintenance bench and the infiltration/bioretention basin or pond bottom. Construct a working area at the end of the maintenance access immediately above the lowest outlet invert elevation of any stormwater pond that is large enough to park an excavator. Do not grade this working area any steeper than 1V:10H in any direction.

12.3.3.2.6 Stormwater Control Practice and Native Seeding Area Signage

Mark SCP areas that use native seed with standard Department signs (I56-50) indicating area is a “no mow/no spray” area. Place signs in locations as directed by the Department. If liners are used, place signs on top of the berms, so as not to damage the liner.

12.3.3.3 Hydrologic Design Criteria

- Design the drainage system so as to not increase the potential for property damage as compared to the pre-Project conditions.

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- Note that Book 1 defines the level of Contractor risk regarding Extreme Rainfall Events.
- Permanent dewatering is not allowed.
- Design stormwater storage facilities to the requirements of TRANS 401 and to safely pass the 100-year, 24-hour rainfall event with an antecedent moisture condition of II. Design stormwater treatment facilities using the average annual rainfall year for the area in which the Project is located.
- Design storm sewer systems and spread, including local roadways, based on FDM Chapter 13.
- Design BOS Hydraulic Structures for a minimum of a 100-year flood frequency event. Hydrologic flows will be calculated in accordance with WisDOT Bridge Manual Section 8.2. Note that flows are subject to approval by BOS as defined in Section 12.3.4 of this document.
- All encroachments (culverts, bridges, fills, cuts, excavations) in mapped floodplains must be approved by the Department.

12.3.3.3.1 Temporary Drainage

Maintain drainage to accommodate construction staging and provide drainage during all stages of construction meeting Project and permit requirements. Address installation of temporary storm sewers and inlets for crossovers and temporary lanes.

12.3.3.4 Bureau of Structures Hydraulic Structures

BOS is responsible for the review and approval of hydraulic and structural adequacy of all cast-in-place and precast box culverts and bridges as defined in the WisDOT Bridge Manual Section 2.5. Hydraulic design criteria for these hydraulic structures are covered in the WisDOT Bridge Manual Chapter 8.

All other culverts are covered under FDM Chapter 13 and submitted as part of the Stormwater-Drainage-Water Quality Report.

12.3.3.4.1 Bridges

Design bridge waterway to maintain the existing channel morphology through the structure. For an existing crossing, design the new bridge so that it does not cause a greater headwater than the current condition, and so that freeboard (the vertical distance between the low cord elevation of the bridge superstructure and the high-water elevation) is a minimum of 2 feet. A cross section that is approximately one bridge length upstream should be used to compare existing and proposed water surface elevations and check freeboard.

Use the USACE HEC-RAS Water Surface Profile Program (current released version) for performing the hydraulic analyses.

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If a bridge is over a commercial or recreational navigable waterway, follow US Coast Guard and DNR requirements (whichever is applicable or most conservative) to provide sufficient clearance.

Intercept stormwater flowing along urban roadway drainage systems toward bridges prior to the approach slab.

Evaluate and ensure adequate deck drainage in accordance with Chapter 29 of the WisDOT Bridge Manual.

Evaluate bridges over waterways for scour, and provide the necessary countermeasures to mitigate scour at existing bridges. Foundation for new bridges must be designed in accordance with the guidelines in FHWA Engineering Circular No. 18, Evaluating Scour at Bridges, Fifth Edition, April 2012 and using FHWA Hydraulic toolbox. Evaluate scour for the temporary condition during construction, and design the necessary countermeasures to mitigate.

Riprap placement at bridge abutments must be in accordance with Chapter 15 and Standard Drawing 15.01 of the WisDOT Bridge Manual. For bridge abutments in urban areas or those frequently used by pedestrians, recommend alternatives to riprap, if applicable.

12.3.3.4.2 BOS Culverts

Culvert extensions may increase the headwater elevation above the existing headwater elevation, but not above the maximum allowable headwater (FDM 13-15-5.4 and 13-15-5.5). Headwater elevation will have no rise in mapped zoned floodplains unless all requirements of the WisDOT/WDNR Cooperative Agreement are met.

Use the FHWA culvert analysis program, HY-8, or the USACE HEC-RAS Water Surface Profile Program for performing the hydraulic analyses.

Model culverts with constant flow and without upstream storage.

12.3.3.5 FDM Drainage Structures

Complete Stormwater-Drainage-Water Quality Report as defined in FDM Chapter 13. Submit this report, corresponding figures, and all supporting hydraulic models and computations to the Department for acceptance.

Refer to FDM 13-1-15 and 13-1-17 for allowable pipe materials under different classifications of roadways.

12.3.3.5.1 FDM Culverts

Analyze the proposed culverts in accordance with FDM Chapter 13. Model culverts with constant flow and without upstream storage.

Use the FHWA culvert analysis program, HY-8, or CulvertMaster for performing the hydraulic analyses.

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For an existing crossing, design the new culvert so that it does not cause a greater headwater than the current condition.

12.3.3.5.2 Storm Drains and Sewer

- Refer to FDM 13-25 regarding storm sewer design.
- Provide pipe outlets with temporary or permanent energy dissipation within 24 hours after connecting the pipe to any new or existing surface waters.
- Locate storm sewer manholes outside of the wheel paths and bicycle lanes. Place drainage structures at all changes in pipe size, pipe grade, and direction.
- Design and construct storm sewers without the use of inverted syphons, lift stations, or other mechanical conveyance systems.
- Before connecting to existing storm sewer and/or culverts, verify all existing features meet the criteria of Section 12.3.3.4.5 (Retaining In-Place Drainage Structures).

12.3.3.5.3 Roadside Open Channels

Base the geometry of roadside open channels (ditches) on the following:

- Refer to FDM 13-30 for open channel and ditch design.
- When designing flat-bottom ditches, design ditches with a bottom width of at least 4 feet and no more than 8 feet.
- Design ditches with a Froude number less than 1. Supercritical flow is not allowed.
- Do not rely solely on swale sections for compliance with water quality treatment requirements.

12.3.3.5.4 Retaining Existing Drainage Structures

12.3.4 Reports and Plans

12.3.4.1 Drainage Overview Map

Submit a Project Drainage Overview Map to the Department, prior to initiating detailed design, in AutoDesk Civil 3D and pdf format. The Project Drainage Overview Map serves as the base plan for final drainage design. Show the existing drainage features and proposed Project drainage Master Plan, including drainage areas and contributing flows of existing and proposed drainage to each point of inflow and outflow from the Project. Show impacts from the Project and proposed mitigation within the map extents, as well as all waters of the State, outstanding resource value waters, special waters, and impaired waters within 1 mile of the Project that receive Project runoff.

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12.3.4.2 Drainage Plans and Specifications

Produce Plans and specifications in a format that facilitates design review by the Department according to Section 5 (Quality Management). In addition, submit the following documents with the RFC Plans:

1. Drainage area maps showing each storm drain inlet with pertinent data, such as boundaries of the drainage area for that inlet, topographic contours, runoff coefficients, times of concentration values and paths, and land use and soil types with design curve number and design runoff coefficient.
2. Location and tabulation of all existing and proposed pipe and drainage structures, including all pipe and drainage structures proposed to be removed or left in place, out of service. These will include size, class or gauge, inlet spacing, detailed structure designs, and any special designs.
3. Complete pipe profiles, including pipe size, type, gradient, and station offsets from the centerline of the roadway, length of pipe, class/gauge of pipe, and numbered drainage structures with coordinate locations and elevations.
4. Drainage Plan sheets showing the location and design of all SCPs and drainage features. If an existing structure or pipe/culvert was removed or abandoned, indicate on the Plans.
5. Drainage calculations and all hydraulic and water quality models used to develop RFC Plans. Provide all models clearly matching the drainage area maps. Submit calculations as a pdf and in electronic format.

12.3.4.3 Drainage Design Report

Prepare a preliminary Drainage Design Report, signed by a Wisconsin-licensed Professional Engineer. This report will be submitted to the DOT Regional SWEC for review and comment. Prepare a final Drainage Design Report incorporating the comments from the SWEC. Include all electronic models, modeling files, and the following within the Drainage Design Report:

- Stormwater Report Cover (SRC).
- Environmental Document Stormwater Factor Sheet.
- Written Narrative. Some projects require a narrative in addition to the spreadsheets to describe complex issues such as protected areas, sensitive areas, addressing special considerations and circumstances from the Environmental Document Factor Sheet, stormwater facilities, drainage issues, region-specific or Project-specific peak flow reduction strategies, stormwater quality alternatives explored, MS4 or TS4 information, TMDL considerations, weighted TSS blending calculations and discussion, and Maximum Extent Practicable (MEP) justifications.
- TS4 Location Map.
- Drainage Summary Spreadsheet (FDM 13-1, Attachment 10.1).

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- Drainage Data Spreadsheet (FDM 13-1, Attachment 10.2).
- Water Quality Results Discussion Spreadsheet (FDM 10-30, Attachment 1.1).
- Grass Lined Channel design (FDM 13-30, Attachment 15.2).
- Riprap Channel design (FDM 13-30, Attachment 25.2).
- Pre- and Post-Construction peak flow rate comparisons.
- Summary of pond or other hydraulic calculations.
- Hand or computer-generated calculations (Rational Formula, TR-55, HydroCAD, PondPack, etc.).
- Culvert sizing calculations.
- Storm sewer design calculations.
- Soils information (NRCS Web Soil Survey), soil testing and infiltration testing information.
- Pre-Construction and Post-Construction Tributary Area Watershed Maps. Typically 11-inch by 17-inch at an easily readable scale. Include labeled contours, Tc lines, drainage areas, surface features, outfall locations, etc., on these maps.
- Protective Area Exhibits. Show proposed roadway, protective area limits, normal water elevation lines, ordinary high-water elevation lines, top of channel lines, etc. Show new discharge locations (pipes, grading, etc.) that impact protective areas.
- Long-term inspection/maintenance plan for stormwater control practices.
- Hydraulic notes, models (input and output files), and tabulations.
- Storm sewer system design calculations.
- Pond designs and calculations, infiltration device designs and calculations, and structural pollution control device designs and calculations, including graphic display of treatment areas and detailed maintenance guidelines for operation.
- Complete set of calculations and detailed drainage area maps detailing pre- and post-drainage conditions, including electronic files.
- Correspondence files.

Prior to Final Acceptance, submit an electronic copy of the Drainage Design Report, including all stormwater models organized by design topic.

12.3.4.4 BOS Hydraulic Structures Hydrology Report

Prior to finalizing hydraulic design and submitting Hydraulic/Site Report (per Section 12.3.4.5), prepare a Hydrology Report signed by a Wisconsin-licensed Professional Engineer, and submit to the Department BOS for their review and concurrence, including the following:

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- Drainage area maps with watershed characteristics in ArcView shapefile format (UTM coordinates). Locate the structure on the maps.
- Hydrologic calculations (where computer software is used, include electronic input and output files).
- Historical or site data used to review computed flows.

12.3.4.5 BOS Hydraulic Structures Hydraulic/Site Report

All BOS Hydraulic Structures, as defined in the WisDOT Bridge Manual Section 2.5, will have a hydraulic and site report prepared in accordance with WisDOT Bridge Manual Section 8.6. The hydraulic report must be signed by a Wisconsin-licensed Professional Engineer, and submitted to the Department BOS for their review and approval.

12.3.4.6 Retaining Wall Scour Analysis Report

Recommendation for retaining wall protection in accordance with Bridge Manual Section 14.4.7.7.

Include recommendation as part of a Retaining Wall Scour Report to address scour analyses and hydraulic data such as high-water elevation and flow velocity.

12.3.4.7 Stream Crossing Structure Survey Report

Submit hydrologic and hydraulic information and waterway design recommendations to the Department on the Stream Crossing Structure Survey Report form “DT1698,” with the appropriate Hydraulic Data shown on the bridge plan as defined in Bridge Manual Section 6.2.2.3.

12.4 Construction Requirements

12.4.1 General

Verify pond dimensions and depth within 1 month of Substantial Completion. Excavate to remove sediment to meet design dimensions prior to Substantial Completion.

12.4.2 Construction Criteria

Maintain drainage to accommodate construction staging and provide drainage during all stages of construction meeting Project and permit requirements. Address temporary culverts to pass off site or excessive runoff through the Project rather than letting the water accumulate in the Work zone and then be filtered by dewatering. Obtain the Department’s approval for abandonment methods for all existing drainage features that are being abandoned with this Project.

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12.4.3 Materials/Testing Requirements

12.4.3.1 Wet Detention Pond Liners

12.5 Deliverables

Table 12-1 lists Deliverables identified in Section, and is not intended to be exhaustive. It is the Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 12-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Project Drainage Overview Map	Acceptance	12.3.4.1
Drainage Plans and Specifications	Approval	12.3.4.2
Drainage Design Report	Approval	12.3.4.3
BOS Hydraulic Structures Hydrology Report	Approval	12.3.4.4
BOS Hydraulic Structures Hydraulic/Site Report	Approval	12.3.4.5
Retaining Wall Scour Analysis Report	Approval	12.3.4.6
Stream Crossing Structure Survey Report	Approval	12.3.4.7
Infiltration basin test results	Acceptance	12.3.3.2.2
Wet Detention Pond Liners	Acceptance	12.4.3
Inspection/maintenance plan for each WisDOT approved stormwater control device		

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EXHIBITS

All exhibits provided as electronic files, unless otherwise noted.

Exhibit 12-A Equipment/Software (attached)

Exhibit 12-B Stormwater Storage Facilities Design (attached)

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Exhibit 12-A: Equipment/Software

Choose drainage design software from the following list:

Software	Possible Vendor	Functions
Autodesk Civil 3D	AutoDesk	• Rational method hydrology • Inlet design and spread analysis • Storm drain pipe design and hydraulic grade line analysis
HydroCAD	HydroCAD Software Solutions LLC	• Generate NRCS (SCS) hydrograph • Develop stage-storage and stage-discharge for ponds • Combine/route hydrographs through ponds and channels
XP-SWMM	XP-Software	• Generate NRCS (SCS) hydrograph or model historical storm • Dynamic routing of hydrographs through ponds, pipes, and channels with varying tailwater/flow conditions
Hydraulic Toolbox	FHWA	• Channel lining analysis • Inlet design and spread analysis • Bridge scour calculations • Rational method hydrology • Curb and gutter design
HY-8	FHWA	• Analyze headwater and hydraulics for single culvert, multiple barrels, broken back culverts and/or road overtopping • Design pipe size based on maximum headwater • Energy dissipater design • AOP
HEC-HMS	USACE	• Simulates the precipitation-runoff processes of dendritic drainage basins
HEC-RAS	USACE	• Water surface profiles for steady or unsteady flow • Analysis of bridges, bridge-culverts, and culverts
WinSLAMM	PVA	• Urban water quality model
PEAKFQ	USGS	• Gauge flood frequency analysis
SMS with SRH2D	Aquaveo	• Performs surface water simulations in a 2D environment. • Analysis of bridges, bridge-culverts and culverts

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Exhibit 12-B: Detention Pond Design

Detention Pond Facilities

- Design all stormwater storage facilities with an emergency overflow to accommodate a 100-year rainfall event. Emergency overflows may consist of structures, overland channels, etc. Permanently line all overland channels based on the flow produced during the 100-year rainfall event. Extend the lining from the crest of the berm on the interior side of the stormwater storage facility to a minimum 5 feet beyond the toe of slope along the exterior edge of the stormwater storage facility.

Wet Detention Ponds

- Provide a minimum of depth from the lowest outlet invert elevation to the pond bottom of at least 2 feet, and a maximum depth of 10 feet.
- Provide a 1:10 (V:H) bench extending from the lowest outlet invert elevation 8 feet horizontally into the ponds, with other slopes no steeper than 1:3 (V:H).
- Extend riprap for pipes discharging into the ponds to the pond bottom to prevent erosion.
- Provide submerged outlets at ponds to retain floating oils and other materials. Incorporate in the outlet a combination of weirs and orifices to extend the detention time of runoff from low-intensity events while passing peak flow from the design event. Construct the pipe crown of the submerged outlet a minimum of 0.5 foot below the outlet elevation. Construct the submerged pipe inlet a minimum of 2 feet above the pond bottom.
- Dead storage beneath the outlet invert elevation for water quality ponds must meet the NURP particle size distribution and watershed requirements.

Infiltration Basins and Bioretention Basins

- Route rainfall runoff around the infiltration basin to the outfall during construction until all disturbed tributary areas have been restored and turf within the infiltration basin is fully established.
- Provide an overflow to limit water depth in the infiltration basin so that the water elevation is above the surface for no more than 48 hours.
- Base infiltration rates for the design of the infiltration basins on the WDNR technical standard 1002 design infiltration rates. Do not use measured infiltration rates to design the infiltration basins.
- Design and construct side slopes to be 1:3 (V:H) or flatter.

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13 Structures

13.1 General

This section discusses the design and construction requirements of permanent and temporary Structures, including bridges, retaining walls, barriers, box culverts, precast concrete arches, precast long-span concrete structures, sign structures, noise walls, and structure rehabilitations.

13.2 Administrative Requirements

13.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to structures, follow the order of precedence set forth below, unless otherwise specified.

13.2.1.1 Bridges

- WisDOT LRFD Bridge Manual
- WisDOT Bridge Manual Standard Drawings
- WisDOT Facilities Design Manual (FDM)
- *WisDOT Geotechnical Manual*
- AASHTO *LRFD Bridge Design Specifications*
- AASHTO *LRFD Bridge Construction Specifications*
- AASHTO *LRFD Guide Specifications for the Design of Pedestrian Bridges*
- AASHTO *Manual for Bridge Evaluation*
- AASHTO *Guide Design Specifications for Bridge Temporary Works*
- AASHTO *Construction Handbook for Bridge Temporary Works*
- AASHTO/ National Steel Bridge Alliance (NSBA) *Steel Bridge Fabrication Guide Specification*
- AASHTO/NSBA *Guide Specification for Application of Coating Systems with Zinc-Rich Primers to Steel Bridges*
- AREMA Manual for Railway Engineering (AREMA Manual)
- FHWA *Post-Tensioning Tendon Installation and Grouting Manual*
- AASHTO *Guide specifications for Design and Construction of Segmental Concrete Bridges*
- Post-Tensioning Institute (PTI) *Acceptance Standards for Post-Tensioning Systems*

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- CEB-FIP *Model Code for Concrete Structures (For Time Dependent Behavior of Concrete)*
- Remaining standards set forth in Book 3

13.2.1.2 Retaining Walls

- WisDOT LRFD Bridge Manual
- WisDOT Bridge Manual Standard Drawings
- *WisDOT Geotechnical Manual*
- AASHTO *LRFD Bridge Design Specifications*
- AASHTO *LRFD Bridge Construction Specifications*
- AASHTO *Guide Design Specifications for Bridge Temporary Works*
- AASHTO *Construction Handbook for Bridge Temporary Works*
- FHWA *Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Design and Construction Guidelines*
- FHWA *Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes*
- FHWA *Geotechnical Engineering Circular Number 4 Ground Anchors and Anchored Systems*
- FHWA *Manual for Design and Construction Monitoring of Soil Nail Walls*
- AASHTO *Standard Specifications for Highway Bridges*
- Remaining standards set forth in Book 3

13.2.1.3 Noise Walls

- WisDOT LRFD Bridge Manual
- *WisDOT Geotechnical Manual*
- AASHTO *LRFD Bridge Design Specifications*
- AASHTO *LRFD Bridge Construction Specifications*
- AASHTO *Guide Specifications for Structural Design of Sound Barriers*
- Remaining standards set forth in Book 3

13.2.1.4 Culverts

- WisDOT LRFD Bridge Manual
- WisDOT Bridge Manual Standard Drawings

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- *WisDOT Geotechnical Manual*
- AASHTO *LRFD Bridge Design Specifications*
- AASHTO *LRFD Bridge Construction Specifications*
- Remaining standards set forth in Book 3

13.2.1.5 Sign Structures

- *WisDOT LRFD Bridge Manual*
- AASHTO *LRFD Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals, 1st Edition (2015) (LRFDTS-1) with current Interim revisions.*
- WisDOT Geotechnical Manual
- WisDOT Facilities Development Manual (FDM)
- WisDOT Standard Specifications for Highway and Structure Construction
- WisDOT Construction and Materials Manual
- AASHTO LRFD Bridge Design Specifications (Current Edition and Interim Specifications)
- American Society for Testing and Materials Standards (ASTM)
- American National Standards Institute/American Petroleum Institute 5L Specification for Line Pipe (ANSI/API 5L)
- AWS D1.1 Structural Welding Code (Steel)
- AWS D1.2 Structural Welding Code (Aluminum)
- Remaining standards set forth in Book 3

13.2.2 Meeting Requirements

13.2.3 Permits/Authorizations

13.3 Design Requirements

13.3.1 General

All bridges in the State of Wisconsin carrying highway traffic are to be designed to AASHTO *LRFD Design Specifications* ASTM, the American Welding Society (AWS) and the Department Standards. Design requirements are defined in the WisDOT LRFD Bridge Manual and WisDOT Bridge Manual Standard Drawings. The material in this RFP is supplemental to these specifications.

All highway bridges are to be constructed according to State of Wisconsin, Department of Transportation, Division of Transportation Systems Development Standard Specifications for

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Highway and Structure Construction and applicable supplemental specifications and special provisions as necessary for the individual project.

Do not consider the barrier railing as part of the cross-section for design of any structural system.

Prepare final plans and design, and construct structures at the locations provided in the tables below.

13.3.1.1 Structure Replacements

Existing Structure Number	Proposed Structure Number	Existing Structure Configuration	Proposed Structure Configuration

13.3.1.2 Structure Rehabilitations

Existing Structure Number	Existing Structure Configuration	Proposed Rehabilitation Work Action

13.3.2 Investigations/Supplemental Work

13.3.3 Design Criteria

13.3.3.1 Bridge Type

The following bridge types are acceptable for use on this Project:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

13.3.3.2 Loads and Forces

The following loads and configurations will be applied to the structures in addition to what is stated in the WisDOT LRFD Bridge Manual:

- [List Additional Load Requirements]

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13.3.3.3 Load Combinations

Follow WisDOT LRFD Bridge Manual for approved load combinations for each structural component.

The following load combinations will be applied to specific structural components in addition to what is stated in the WisDOT LRFD Bridge Manual:

- [List Any Additional Load Combinations]

13.3.3.4 Structural Components

13.3.3.4.1 Foundations

Allowable foundation types for Structure Number [List bridge numbers] (unless precluded by existing conditions defined elsewhere in the Contract Documents) are as follows:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

The overall foundation support design process requires an iterative collaboration to provide cost-effective constructible substructures. A Site Investigation Report is required for all structures, in accordance with Section 8 (Geotechnical).

13.3.3.4.2 Abutments

Abutment type selection should be in accordance with WisDOT LRFD Bridge Manual Chapter 12, and standard abutment types should be used whenever sites allow. Special designs of abutments require prior approval by the Department's Bureau of Structures Development Chief.

The following abutment types are acceptable for use on this Project:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

The following wing wall types are acceptable for use on this Project:

- Choose an item.

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- Choose an item.
- Choose an item.
- Choose an item.

Due to maintenance concerns, MSE walls will not be used for the singular purpose of reducing span length. If the grade line cannot be raised, then MSE walls may be used to maintain the superstructure depth. Other circumstances may also justify the use of MSE walls at abutments. Do not use MSE walls in front of abutments unless Approved by the Department.

13.3.3.4.3 Piers and Pier Caps

Position all median piers so they are centered within the median, unless otherwise Approved by the Department.

Use of H-Piles in open pile bents requires approval by the Department's Bureau of Structures Development Chief.

Pier design will consider staged construction and loading conditions as appropriate to maintain the necessary traffic configuration.

The following pier types are acceptable for use on this Project:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

13.3.3.4.4 Slope Protection

Provide slope protection for all slopes under bridges in accordance with Section 15 (Visual Quality Management and Aesthetics) and WisDOT Bridge Manual Chapter 15.

Use Choose an item. under all bridges for this Project.

13.3.3.4.5 Joints and Bearings

Limit the number of bridge expansion joints to the extent possible. Design bridges preferably to be continuous with integral or semi-integral abutment diaphragms without deck expansion joints.

Compression seals are not allowed on new bridges.

Where needed, expansion joints between units to be located at abutments—or in the case of longer, multi-unit structures—over piers.

Conventional plain or laminated (steel-reinforced) elastomeric bearings are to be used wherever possible.

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13.3.3.4.6 Girders

Use the same girder material type— either steel or concrete—and the same beam style for all spans in each bridge. Comply with requirements of Section 15 (Visual Quality Management and Aesthetics).

The following girder types are acceptable for use on this Project:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

13.3.3.4.6.1 *Prestressed Girders*

Design pre-stressed concrete girders without post-tensioning as continuous spans.

The use of variable number of girders between spans requires approval from the Department's Bureau of Structures Development Chief.

13.3.3.4.6.2 *Steel Girders*

13.3.3.4.7 Decks

The following deck types are acceptable for use on this Project:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

Sidewalks must be a minimum of 6 feet wide and are required on the following structures: [List bridge numbers]

13.3.3.4.8 Slabs or Slab Spans

Design all slabs using cast-in-place concrete.

13.3.3.4.9 Bridge Barriers and Pedestrian Railings

Unless otherwise required, comply with the standard railing details provided in WisDOT *Bridge* Standard Drawings and Section 15 (Visual Quality Management and Aesthetics).

[List bridge numbers] type Pedestrian Railing should be used on the following structures: [List bridge numbers].

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Combination Railings are used concurrently with a raised sidewalk on roadways with a design speed of 45 mph or less, and should be used on the following structures: [List bridge numbers]

Adhesive anchored parapets are allowed at interior traffic railing locations only when the adjacent exterior parapet is crash test approved.

The maximum combined height of sidewalks, bridge barriers, and railings will not exceed 11 feet from the top of deck elevation without approval from the Department Bureau of Structures.

13.3.3.4.10 Structural Approach Slabs

Structural Approach Slabs will be required on the following structures: [List bridge numbers].

Concrete Approach Slabs are required on the following structures: [List bridge numbers].

Details for Structural Approach Slabs should be included as part of the structure plan.

Do not apply polymer overlays to structural approach slabs.

13.3.3.4.11 Drainage Systems

Deck drains [List bridge numbers] allowed on this Project.

The following deck drain types are acceptable on this Project:

- Choose an item.
- Choose an item.
- Choose an item.

[List bridge numbers] require a full drainage capture system.

13.3.3.5 Load Rating

13.3.3.6 Additional Design Requirements

13.3.3.6.1 Maintenance and Inspection

Design elements of bridge superstructures to be accessible by ladder or an under-bridge inspection vehicle (UBIV) with a 62-foot arm. Include means for inspection and maintenance access and replacement in the design of bridge joints and bearings.

13.3.3.6.2 Bridge Grounding

13.3.3.6.3 Vertical Clearance

The required vertical clearance for new bridges and bridges on which the superstructure is being replaced are given in the WisDOT FDM 11-35, Attachment 1.8.

Design Work for existing bridges according to the following:

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1. If an existing bridge's vertical clearance does not meet current WisDOT FDM 11-35, Attachment 1.9 requirements for existing bridges, increase to the lower minimum, or a design justification is required.
2. If an existing bridge's vertical clearance is greater than the current WisDOT FDM requirements for existing bridges, the vertical clearance may be lowered provided that the proposed clearance satisfies the requirements.
3. When modifying the vertical clearance of existing bridges, ensure the modifications do not negatively affect the bridges' foundations. Ensure that the minimum cover on top of pier footings and the bottom of footing elevation comply with the requirements of the WisDOT LRFD Bridge Manual.
4. Modifications to achieve vertical clearance should not adversely impact the drainage requirements of Section 12 (Drainage).

Provide a minimum vertical clearance as stipulated in WisDOT FDM 11-35 and in accordance with Section 21 (Railroad) from top of rail to lowest obstruction for any bridge span located over the Railroad. Extend the vertical clearance envelope horizontally as stipulated in Section 21 (Railroad).

A minimum vertical clearance of 18 feet, 3 inches is required for sign structures on most routes. See WisDOT FDM 11-35, Attachment 1.8. For sign structures over a designated High Clearance Route, a vertical clearance of 20 feet, 3 inches is required. See FDM 11-35, Attachment 1.9 for clearance related to existing sign structures.

13.3.3.7 Permanent Retaining Wall Structures

Determine the location(s) and types of retaining walls needed on the Project. See WisDOT FDM 11-55-5.4 for retaining wall R/W requirements. All segments and structural components of a retaining wall should be within the Department's R/W.

The following permanent retaining wall types are allowed if they meet the Department's standards and are not precluded by conditions defined elsewhere in the Contract Documents:

- CIP concrete gravity wall
- CIP concrete cantilever wall
- Soil nail wall
- Soldier pile wall
- Sheet pile wall
- Tangent/Secant wall
- MSE walls, including precast panels, modular blocks, geogrid, wire-faced
- Modular block gravity wall
- Prefabricated Bin, Crib, and Gabion Walls Rock wall

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All proprietary retaining wall systems must be on the Department's Approved Products List prior to award.

13.3.3.8 Temporary Shoring

13.3.3.9 Noise Walls

All Noise Barriers will be Choose an item. absorptive.

Noise wall systems used must be on the Department's Approved Product List prior to award. Provide the name of the selected system and the intended fabricator within 25 Days after award of the Project. Schedule a pre-design meeting with the Department before beginning design of the noise barrier.

Noise walls are not allowed on Bridges.

13.3.3.10 Box Culverts

Buried structure types allowed are as follows:

- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.
- Choose an item.

13.3.3.11 Sign Structures

Roadside Signs refer to roadside signs supported on ground-mounted posts adjacent to roadways. Ground-mounted sign support posts are not considered "structures," and are therefore not assigned a structure number. See WisDOT Sign Plate Manual for details.

Do not construct foundations for overhead and cantilever sign structures on or in the reinforced zone of MSE retaining walls or Reinforced Soil Slopes.

13.3.4 Reports and Plans

Submit a Structure Inventory Form for each structure prior to the start of bridge construction with RFC plans.

13.3.5 Bridge Load Rating

Complete a WisDOT Load Rating Summary Form for each bridge on the Project, and submit 6 weeks before the associated bridge is opened to vehicular traffic.

With each report, submit load rating calculations. Base ratings on the final configuration of the bridge.

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If a refined analysis is required, submit the Refined Analysis Rating Form in addition to the Load Rating Summary Form.

13.4 Construction Requirements

13.4.1 General

13.4.2 Construction Criteria

13.4.2.1 *Bracing*

13.4.2.2 *Field and Shop Painting of Structural Steel*

13.4.2.3 Architectural Finish

13.4.2.4 Full-Depth Monolithic Decks

13.4.2.5 Bridge Decks

13.4.2.6 Retaining Walls

13.4.3 Materials/Testing Requirements

13.4.3.1 Concrete

Do not use lightweight concrete or self-consolidating concrete.

13.4.3.1.1 Prestressed Concrete Girders

13.4.3.1.2 Substructure Concrete

13.4.3.1.3 Superstructure Concrete

Higher Performance Concrete must be used for the bridge superstructure concrete and structural approach slabs on the following structures: [List bridge numbers]

13.4.3.1.4 Precast Concrete

Provide a minimum concrete compressive strength of 4 kips per square inch 9.

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13.4.3.2 Prestressing Steel

13.4.3.3 Reinforcing Steel

Comply with the Department's standards and specifications.

13.4.3.4 Structural Steel

13.4.3.5 Structural Metals

Comply with Standard Specification 506 for fabrication of structural metals. Hold a pre-fabrication meeting at least 2 weeks prior to beginning shop or field fabrication.

The Contractor's Quality Control staff, the fabricator's Quality Control staff, and the Department's quality oversight staff must attend the meeting to discuss fabrication method, materials, and documentation required under Standard Specification 506.

13.4.3.6 Field and Shop Painting of Structural Steel

13.4.3.7 Timber

13.4.4 Instrumentation/Monitoring Plan

13.5 Deliverables

Table 13-1, which lists Deliverables identified in Section 13, is not intended to be exhaustive. It is the Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 13-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference	Time
Preliminary Bridge Plans	Acceptance	5.4.9.6	Prior to bridge construction
RFC (Final) Bridge Plans, Structure Inventory Form	Acceptance	5.4.9.1/13.3.4	Prior to bridge construction
Special Provisions – RFC	Approval	5.4.9.1	Prior to bridge construction
Record Set Bridge Plans	Acceptance	5.4.9.7	Minimum 6 weeks prior to Bridge opening
Load Rating Calculations and Load Rating Summary Form, Slab/Prestress Input Files (when applicable), Refined Analysis Rating Form (when applicable)	Acceptance	13.3.5	Minimum 6 weeks prior to bridge opening
As-Built Bridge Plans	Acceptance	5.4.9.8	After Construction, completion

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EXHIBITS

Exhibit 13-A

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14 Landscape and Erosion Control

14.1 General

Sections 14.2 and 14.3 identify the design and construction requirements for landscape and erosion control Work, respectively. For landscape Work, this includes installation and establishing turf, trees, shrubs, and native and/or ornamental grasses and forbs; seeding operations, maintenance of plantings; preliminary Work for future planting areas; identifying, preserving, and protecting existing vegetative assets; managing soils; and controlling invasive and noxious weeds/shrubs/trees for the Project. For erosion control Work, this includes erosion control permit, plans, and implementation plan requirements and processes, construction and inspection requirements, including watering, coordination requirements with the Department and the DNR, and final Notice of Termination (NOT) requirements for the Project.

14.2 Landscape

14.2.1 Landscape Administrative Requirements

14.2.1.1 Landscape Standards

In the event of a conflict among the standards set forth in Book 3 relating to Landscape, follow the order of precedence as set forth below, unless otherwise specified:

- WisDOT *Facilities Development Manual (FDM) Chapter 27*
- WisDOT *Construction and Materials Manual (CMM)*
- Local municipality and sponsorship programs
- WisDOT *Highway Maintenance Manual (HMM)*
- WisDOT Transportation Landscaping Design Handbook
- Code of Federal Regulations, Title 23 (Highways), Chapter 1, Part 752, *Landscape and Roadside Development*
- AASHTO *A Guide for Transportation Landscape and Environmental Design*
- WisDOT Technical Memoranda
- *International Society of Arboriculture and the Council of Tree and Landscape Appraisers Guide for Plant Appraisal*
- Remaining standards set forth in Book 3

14.2.1.2 Landscape Licenses and Certification

Design-Builder will have a Landscape Architect licensed in Wisconsin seal all Landscape drawings. The credential holder’s seal should only include the numbers before the dash (i.e. 30666-006, 8178-005). The inner circle area of the seal must include the credential holder's name, credential number, and the city and state where the credential holder resides or is

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employed. This information serves as a basis for locating the credential holder, and should be the same as the mailing address on file with the Board office (i.e., if the credential holder's address is Memphis, TN; then Memphis, TN must be placed on the inner circle).

Submit names, relevant educational and professional experience, certifications, licenses and contact information for all herbicide or other specialty plant procedural applicators and operators.

14.2.1.3 Landscape Meeting Requirements

Meet with Bureau of Highway Maintenance (BHM) Landscape Architect Contacts (LACs) during the Planting Plan Development Process (site tour; plan review meetings at milestone deliverable dates; utility coordination meetings; biweekly landscape review meetings, or as often as deemed necessary; and prior to commencing with clearing and grubbing operations or other relevant construction tasks; construction meetings, including nursery site visits). Identify and mark/stake in advance all invasive and noxious weed areas, tree and shrub locations, trees to preserve and protect or remove, and proposed plant locations.

As part of the Vegetation Preservation/Protection and Removal Plan described in Section 14.2.2.1.2 and before the site walk, submit a count of specimen trees: both those proposed to be removed due to construction operations, and those to be preserved and protected.

14.2.1.4 Landscape Equipment/Software

Provide list of equipment and software required to accomplish planting tasks, including transplant of large-caliper-sized trees and GPS-based technologies to coordinate and document existing, demolished, and proposed landscape assets.

14.2.1.5 Landscape Permits/Authorizations

Review and coordinate activities with past and ongoing Section 4 (Environmental Compliance) requirements for permitting related to physical and natural factors, including cultural resources. Provide a summary of required coordination activities and progress as part of each meeting.

Comply with the Wisconsin Administration Code NR 40 Invasive Species identification, classification, and control; and state listed noxious weeds. Follow rights-of-way best management practices (https://councilonforestry.wi.gov/Pages/InvasiveSpecies/RightsOfWay.aspx). Comply with the Wisconsin aquatic invasive species Management Plan. Ensure all equipment intended for use within Project limits is free of invasive species.

No clearing is allowed outside the designated Project clearing limits provided in Section 7 (Right-of-Way).

Comply with Wisconsin Department of Agricultural, Trade and Consumer Protection (DATCP) and WDNR herbicide license, certification, and permitting requirements.

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14.2.2 Landscape Design Requirements

14.2.2.1 Landscape Design Requirements

Team with a licensed landscape architect to apply design principles at the beginning of the development process. The goal is to integrate transportation facilities into their surroundings while preserving and enhancing visual quality, making the highway environment safer and protecting the environment. Landscape design will follow the Natural Roadsides Philosophy (FDM 27-1-10.2) to encourage the preservation and regeneration of native plants and native plant communities while maintaining the topographical and geological character of the landscape.

Review and coordinate landscape development with environmental compliance requirements as well as pre-Design-Build agreements (e.g., roundabouts) with local municipalities, civic organizations, private industry, or other agencies.

14.2.2.1.1 Visual Quality Management Plan

If required, refer to Section 15 (Visual Quality Management) for the visual quality design, construction, and management requirements of the Project. Coordinate landscape development with Project Visual Quality Manager who reports to the Design-Build PM. This individual must be available to be on site during design and construction activities involving visual quality issues, and coordinate milestone dates with BHM LACs.

If a formal Visual Quality Management program is not required for the Project, continue with the following documentation.

14.2.2.1.2 Landscape Assets

In conjunction with the initial site tour with BHM LACs, conduct a desktop review of WisDOT's Vegetation Assets Map (ArcGIS database) and site investigation/inventory to determine locations of proposed impacts to existing landscape assets. Landscape assets are defined as existing trees and shrubs, functional plantings such as living snow fence, prairie remnants, and other plants of significance such as heritage trees, street trees, or rare plants, including those outside the clear zone or construction limits. Incorporate this information to guide preservation and restoration of landscape features in the Vegetation Preservation/Protection and Removal Plan sheets in the Released for Construction (RFC) Documents. Design-Builder will document the status of desirable vegetation impacted by, or protected during, construction for integration into WisDOT's Vegetation Assets Map (ArcGIS database) at the conclusion of the Project.

Vegetation may be desirable if they have an attractive form or groupings, are in a strategic place, are rare plants that have threatened, endangered, or special concern status, or have historical or cultural significance. Potential tree candidates or tree stands should also consider species, condition, age, size, and location. Identify and mark/stake vegetation to remove, preserve, and transplant, and transplant destination site for site tour. Provide preservation/transplanting protocols for review.

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Vegetation Preservation/Protection and Removal Plan will show the following, at a minimum:

- Trees that are infected/infested with disease or pest-designated for removal and approach for preservation. Particular attention will be given to ash trees infested with emerald ash bore.
- Ongoing investigations and requirements of the Endangered Resource Review in Section 4 (Environmental Compliance).
- Inventory area(s) of vegetation removal, including species, size range, condition, and location of trees and other plants proposed to be disturbed, removed, or transplanted. Include any hazard trees. Disturbance includes total or partial damage or injury to the roots, trunk, or crown, including damage caused by soil compaction or the addition of soil over the plant root zone and tree collar.
- Removal of hazardous trees with height enough to place them within striking distance of targets, including infrastructure such as buildings, shared-use paths, sidewalks, roadways, and landscape assets, if the tree fell over or a portion of the tree fell. Hazardous trees are trees, either dead or alive, with serious structural defects posing a safety risk due to the possibility they may break or fall on and damage a target. Targets are anything of value, including people, buildings, vehicles, or other property. Targets may also include power lines or phone lines. Power lines present direct safety hazards. Both elements (the defective tree and the target) must be present for the tree to be classified as hazardous. Include removal of all ash trees within 25 feet of any soil disturbance and/or within R/W or approved impact zone, which includes driving equipment or placing materials within 25 feet of any ash tree.
- Functional plantings such as living snow fence, etc., as defined in FDM 27-20-5.4.
- Tree Preservation/Protection planning of location and specific protection measures such as protective fencing prior to clearing, grubbing, and earthwork operations include establishing a Tree Protection Zone (TPZ) where construction activities are prohibited or restricted to prevent injury to preserved trees, especially during pre-construction and construction, and includes the Critical Root Zone (CRZ). The CRZ is the area of soil extending from the tree trunk where roots required for future tree health and survival are located. This area can also be defined as a circle with a minimum radius of 1 foot for every 1 inch in trunk diameter at 4.5 feet above ground, and protection for specimen or significant trees, other existing trees, and shrub masses that will not be removed, but are within 100 feet of the vegetation proposed for removal, whether within or outside construction limits. Consult BHM LACs for specific measures to address site conditions.
- Proposed vegetation to be transplanted (trees, rare plants per Endangered Species Act, and other desirable vegetation of specimen quality) and transplant locations. Consult with BHM LACs for timing and other issues related to transplanting operations and HMM 7-25-05 Plant Rescue.

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14.2.2.1.3 Not Used

14.2.2.1.4 Visual Impact Assessment

A Visual Impact Assessment (VIA) will be conducted when there are potentially significant adverse visual impacts. To anticipate when a VIA should be considered, consult BHM LACs and the following guidance. Conduct a VIA if anyone, or any combination, of the following elements are present on or within view of your Project. This list is not all-inclusive.

- Important cultural features. Important may be defined by other agencies or the people of that area.
- Important natural or physical features. Important may be defined by other agencies or the people of that area. Natural or physical features may include, but are not limited to:
  - landforms such as cliffs/bluffs, rock outcrops, steep hills/ ridges, rolling hills, ravines, valleys/ basins, plains/ flatlands, beaches.
  - water bodies such as bays/inlets, lakes/ponds, rivers/streams, wetlands, waterfalls/rapids.
  - vegetation types such as plantation, orchard, pasture, cropland, prairie remnant, coniferous forest, deciduous forest.
- National or State Scenic Byway
- Part of the Coastal Zone Management areas of Lake Michigan/Lake Superior
- Part of a Main Street Program
- Intersects with a Rustic Road
- Located within the lower Wisconsin River Way
- An area dependent on tourism
- Affects scenic waysides or overlooks
- Travels by a significant historical building
- Is within or crosses a significant historic district

Refer to FDM Chapter 27-10 to prepare a VIA capturing site and user inventory and evaluation that can be used to guide landscape design principles, goals, and objectives moving forward. Meet with BHM LACs to discuss inventory, summary analysis, mitigation methods, and initial design approach.

14.2.2.1.5 Investigations/Supplemental Work

Consult with BHM LACs to coordinate landscape Work with any ongoing research studies or Department initiatives.

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14.2.2.1.6 Landscape Plan Development Process

Coordinate Section 5 (Quality Management) and the Planting Plan Development Process as outlined in the FDM-27-20-1, conforming with document requirements and milestones: Site Inventory/Analysis review and acceptance; Preliminary/In-progress Plans; and RFCs/Resubmittals.

Submit Maintenance Plans with RFCs.

14.2.2.2 Landscape Design Criteria

Integrate solutions to the following design issues into final plans.

14.2.2.2.1 Planting Context

Reflect local native plant communities in their species composition, restoring the appearance as it looked prior to settlements. Rural areas tend to have minimal plantings arranged in informal groups, whereas formal, more regular plant spacing may be more appropriate for snowdrift control or in urban areas and along transitional highways.

14.2.2.2.2 Planting for Function and Safety

Provide plant types and sizes that, pending site needs, act as visual screens, visual buffers, noise barriers, impact attenuators, delineators, and snowdrift control.

Comply with the Roadside Hazard Analysis and Treatments section of the FDM 11-45-20 and coordinate with BHM LACs and roadway designers: clear zone starting at the edge of the traveled way that is available for safe use by errant vehicles; a vision corner defined as the triangular area located at the intersection of two roads that is free of obstructions that would hinder a driver’s view of one road from the other; the roadside on the inside of horizontal curves; snow drift control; roundabouts; and general vegetation encroachment that causes the psychological feeling that the road is narrowing.

Consider effects of winter shading by carefully siting groups of tall-growing trees so they do not create icing problems upon attaining their mature height. Consult BHM LACs to determine if any project locations may be subject to snowdrift control measures.

14.2.2.2.3 Erosion Control Coordination

Provide complete and accurate plans that differentiate between temporary erosion prevention (interim, multiple soil, and water conveyance stabilizations over the life of the Contract) and permanent erosion prevention (completed when land disturbance is finally finished for that area) or final landscape finish. Do not allow non-natives in the cover crop components of the interim seed mixture service life to inhibit the perennial seeded mixtures used at later times.

Design temporary and permanent erosion and sediment control measures complying with the requirements of this and other relevant sections in a manner that will not prohibit or compromise the installation, effectiveness, health, or design intent of permanent turf, other vegetation, or

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vegetative assets to be preserved. Consult BHM LACs early in the design process to coordinate landscape disturbance and interim and final landscape treatments.

14.2.2.2.4 Planting for Aesthetics

As determined in the site analysis stage, incorporate a plant palette that adds interest to the landscape (evergreen, texture, color, etc.), frames views and site features, softens harsh edges or expansive surface areas, blends adjacent land, highlights natural features, and supports historic building restoration efforts. In some site conditions, views can be created or enhanced by selectively removing vegetation.

See Section 13 (Structures) and Section 15 (Visual Quality and Aesthetics) to coordinate BHM LACs planting and aesthetic approach to bridges, retaining walls, noise walls, and other significant features like drainage structures.

14.2.2.2.5 Physical Constraints

Identify and reconcile physical constraints that may limit the amount or type of plantings that can be installed: minimum clearances around underground and overhead utility lines; obstruction of outdoor advertising signs; impeding water flow of ditches or other drainage ways; minimum clearances around bridge abutments to allow for safety inspections; offset from R/W lines so they do not encroach upon neighboring property and do not interfere with fence maintenance; and effects of salt spray carried by prevailing winds.

14.2.2.2.6 Effects of Plantings on the Environment

See Section 4 (Environmental Compliance) for regulations that address nesting birds, pollinators, and threatened or endangered species or their habitat. The following are legislation, policy, and design guide resources.

- 23 U.S. Code Section 329 – Eligibility for control of noxious weeds and aquatic noxious weeds and establishment of native species.
  https://www.law.cornell.edu/uscode/text/23/329
- Migratory Bird Treaty Act (MBTA) of 1918
  https://www.fws.gov/laws/lawsdigest/migtrea.html
- Federal Highway Administration Environmental Review Toolkit
  https://www.environment.fhwa.dot.gov/env_topics/ecosystems_vegetation.aspx
- Federal Highway Administration Environmental Review Toolkit for pollinators
- https://www.environment.fhwa.dot.gov/env_topics/ecosystems/pollinators.aspx

14.2.2.2.7 Construction and Maintenance Considerations

Capitalize on the integration of Project/Contract structure by coordinating planting design intent with grading, paving, utilities, access, and sequencing prior to construction.

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Plant Materials: Unless otherwise approved by the BHM LACs, all plants will be grown within the states of Wisconsin, Minnesota, Iowa, Michigan, or the parts of Illinois, Indiana, or Ohio located within Zone 4 and 5 of the "Plant Hardiness Zone Map (2012)" produced by the United States Department of Agriculture, Agricultural Research Service, and consistent with the Project location Zone. A list of sources for plants will be furnished in accordance with Miscellaneous Publication No. 1475, issued January 1990 (or current edition) before planting begins for fall-planted plants, and before March 15 for spring-planted plants. All sources will be subject to verification by the BHM LACs.

Substitutions may be permitted only upon submission of written proof that specified plant is **not** available (per requirements described above obtainable) from no less than five nurseries with a minimum size of 300 acres. Any such substitution may only be made upon written authorization by BHM LACs.

Consult with BHM LACs to confirm if DNR may serve as another source of plant material for the Project.

Design for low-maintenance plantings in landscape plans. See FDM 27-20-1.8 for more information on maintenance plans. After the Plant Establishment Period has expired (see FDM 27-25-10), little if any additional maintenance will typically be performed, except in rare cases such as in urban areas which may have more sophisticated plantings or there is a municipal agreement in place for maintenance.

14.2.2.2.8 Invasive Species and Noxious Weeds

Remove or control all State-listed noxious weeds and NR40-listed prohibited and wild parsnip, Japanese knotweed, and phragmites-restricted invasive species located in areas where turf or other vegetation will be disturbed following methods described in Section 14.2.2.2.9 (Invasive Species Control Plan). Disturbance of turf includes foot and vehicle traffic, equipment moving, and material storage atop plants. Place fence or other suitable, impenetrable barrier around the perimeter of areas with invasive species that are not subject to disturbance to ensure that those areas remain undisturbed, and thus do not need to be treated.

Consult the current State list of prohibited noxious weeds located on the Wisconsin State Legislature website: http://docs.legis.wisconsin.gov/statutes/statutes/66/IV/0407/1/b. This includes Canada thistle, leafy spurge, and field bindweed (Creeping Jenny).

Comply with Department of Natural Resources Administrative Code. Regulation, NR 40, Invasive Species Identification, Classification and Control: https://docs.legis.wisconsin.gov/code/admin_code/nr/001/40.pdf. This includes the movement of invasive plants or their seeds, either intentionally through planting or unintentionally through construction, mowing, or other operations.

14.2.2.2.9 Invasive Species Control Plan

Prepare an Invasive Species Control Plan that identifies and maps State-listed noxious weeds, NR40 prohibited species, and restricted species, specifically Wild Parsnip, Japanese Knotweed,

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and Phragmites. Identify and map locations of other invasive plants within the Project area that are likely to pose a challenge to native seeding when native seeding is proposed. During the perennial plant establishment phase, update the weed list a minimum of one time within the growing season (April 15 to September 30) that defines the schedule and methods to maximize desirable plant species. Include the following information in the Plan:

- Locations of State-listed noxious weeds and other NR40 invasive species within the Project area that would pose a challenge to native seeding.
- Locations of State-listed noxious weeds, NR40-prohibited species, and restricted species, specifically Wild Parsnip, Japanese Knotweed, and Phragmites to be removed or controlled, noting species and extent on a map showing existing topography.
- Quantity of vegetation to be removed or controlled, as either a numerical count of the plants or an estimate based on acreage and vegetation density.
- Schedule and define methods used to control noxious, invasive, or problematic weeds at each location.

Review and update the Invasive Species Control Plan at least once per year and provide to the Department PM.

Record locations of areas of invasive and noxious weeds to be removed or controlled, noting species and extent on a map showing existing topography. Document the quantity of vegetation to be removed or controlled in the plan as either a numerical count of the plants or an estimate based on acreage and vegetation density. Detail schedule and methods used to control noxious weeds at each location.

14.2.2.2.10 Soils Management

See CMM chapter 640, Landscaping, and specification 625, Topsoil and Salvaged Topsoil.

14.2.2.2.11 Plant Materials

Select plant species consistent with WisDOT's Natural Roadsides Policy and consider hardy cultivars, nursery availability, salt tolerance, pollution tolerance, susceptibility to pests, diversity, environmental conditions (soils, moisture, temperature, sun/shade, slope aspect), and adjacent land use.

Preserve and enhance native plant communities through use of herbaceous plants for both erosion control and aesthetic purposes. Consult with BHM LACs and other review agencies if plant community preservation or rescue is expected, guidance on seed mix selection, and special considerations for roadside sites such as rest areas or scenic overlooks.

14.2.2.2.12 Establishment Period

Trees, shrubs, and native or garden perennial plants have a two-growing-seasons Plant Establishment Period. Annuals establishment period requirements include replacement of any that die during the course of the growing season.

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Follow native seeding establishment as shown in Standard Specification Section 630 requiring periodic mowing and the eradication of certain invasive, weedy species.

14.2.2.2.13 Plant Establishment Period

A 2-year Plant Establishment Period (PEP) will be required for all landscape plantings unless otherwise determined by Project circumstances. See FDM 27-25-10.

When a 2-year PEP is in force, original plantings may be installed in the fall of one year and/or the spring of the following year. After installation is complete, the contractor is responsible for the plantings for two growing seasons. As an example, if plantings were installed during the fall of 2022 and/or spring of 2023, the contractor would be responsible for their care during the 2023 and 2024 growing seasons. As part of the process, all plant material installed during the fall of 2022 would be inspected in late April or early May 2023. Replacements would be made in spring 2023, along with plant installation not completed the previous fall. All planting would be inspected in the fall of 2023, and again in spring 2024, with replacements made during the respective planting seasons. The final inspection would be made in the fall of 2024, with replacements made during the fall planting season. All Work would be complete by the time the ground freezes in 2024.

14.2.2.2.14 Landscape Planting Surveillance and Care Cycles

The item Landscaping Planting Surveillance and Care Cycles is included on all contracts that include plantings; separate sections apply for woody plants and native seeding. Under this item, the landscape contractor is required to properly care for plants from time of planting until final acceptance of the Work.

As specified in Standard Specification 632.3.19.2, the Department will assess damages in the amount the special provisions specify to cover the cost of performing the Work with other forces. Daily damages specified in the special provision should be dependent upon the value of planting items in the Contract.

14.2.2.2.15 Seed and Sod Establishment

Establish turf in all disturbed areas. Note on the RFC plan sheets the requirements for depth and location of topsoil reuse/placement, as well as any soil decompaction and soil amendment measures and their relation to each type of turf or planting area in the Project area.

Coordinate with Section 14.3 (Erosion Control) on turf seed and sod establishment.

14.2.2.2.16 Native Seed Establishment

For more complex projects and as determined by the BHM LACs, native seeding may be preferred. Native Seed Mixtures are addressed in Special Provisions; consult BHM LACs as appropriate. Native Seed Mixtures are dependent on soil and moisture conditions. Note the locations of native seed mixtures on the RFC documents. Native seeding establishment requires periodic mowing and the eradication of certain invasive, weedy species. Establish native seeds by completing Care and Surveillance Cycles discussed in Section 14.2.3.7. Native

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seed is considered established and acceptable if at least 80 percent of planted areas are healthy, show satisfactory signs of germination, and growth of at least 50 percent of the planted species.

14.2.2.2.17 Landscape Maintenance Plan

Prior to Project acceptance for a landscape planting contract, a representative of the Regional maintenance staff should accompany the BHM LACs and the Contractor's foreman when they go over the final Project punch list to make sure the contractor has fulfilled all of his obligations, and to determine if the Department will need to provide follow-up maintenance for the Department. Review RFC's Landscape Maintenance Plan, Surveillance, and Care Cycles documentation and recommended maintenance activities after the PEP expires. Ensure that vegetation defined in the Plan meets requirements for sight lines and invasive and noxious and general weed control.

In the RFC Documents, include the Contractor's commitment to mow and apply herbicide to control identified common and noxious weeds, including time and frequency, for every Contract year.

14.2.2.3 Landscape Reports/Plans

14.2.2.3.1 RFC Documents

Include the following in RFC Documents:

- Visual Quality Management Plan (if required)
- Visual Impact Assessment (if required)
- Landscape Plans and Details
- Vegetation Preservation/Protection and Removal Plan
- Invasive Species Control Plan
- Maintenance Plan

14.2.3 Landscape Construction Requirements

14.2.3.1 General

14.2.3.2 Construction Criteria

14.2.3.2.1 Qualifications

The Department has two statewide landscape pre-certified contractors lists: one for native seed installation and restoration management, and another for woody vegetation installation and restoration management. Use a contractor from list if the Project includes native seed and woody vegetation. List can be found at

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https://wisconsindot.gov/hccidocs/misc/rfq/Precertified%20Contractor%20Lists-Native%20Seed%20and%20Woody%20Veg_HCCI.pdf.

14.2.3.2.2 Vegetation Preservation/Protection and Removal

Follow all requirements of WisDOT Standard Specification 201, associated Standard Specials and Special Provisions and Standard Plans.

Provide supplemental watering and all other post-transplant care for transplanted trees during the term of the Contract in accordance with Department specifications.

Remove hazardous trees, ash trees, and any portions of hazardous trees using methods that prevent damage or injury to nearby vegetative assets, as indicated on the Vegetation Preservation and Removal plan sheets.

Prior to pre-construction activities, including tree removal, access roads, construction staging areas, etc.; erect tree protection barriers to visually indicate TPZs. Be sure to 1) use tree protection barriers that are highly visible, sturdy, and restrict entry to the TPZ; 2) install signs along the tree protection barrier that indicate that no one is allowed to disturb the area; and 3) remove any branches or trees that pose an immediate risk to structures or people prior to any construction activities.

Communicate the intent of the tree protection barriers to the construction manager and workers to ensure that TPZs are not disturbed during construction activities. Prohibit these activities in the TPZ: 1) Stockpiling of any type, including construction material, debris, soil, gravel; 2) altering soils, including grade changes, surface treatment, and compaction due to vehicle, equipment, and heavy foot traffic; 3) trenching for utility installation or repair and irrigation system installation; 4) attaching anything to tree trunks or use of equipment that causes injury to the tree. Throughout the Project, monitor the tree protection measures and tree health. Keep all tree protection barriers in place until the Project is completed. Other protection measures include applying trunk protection to trees to prevent mechanical injury, and applying 6 inches of mulch or wood chips within the TPZ to prevent disturbance to tree roots and soil.

14.2.3.2.3 Soils Management

Refer to Section 14.2.2.2.10. Clearly mark all herbicide-treated stockpile areas to prevent disturbance prior to the required stockpile period. Topsoil recently treated with herbicides to prevent plant growth may not allow seed germination or support plant growth. If herbicide contamination is suspected, the engineer should contact the Bureau of Highway Maintenance. It may be possible to treat small amounts of topsoil to neutralize the effect of the herbicide. For large amounts, treatment may not be cost-effective, the topsoil will have to be rejected, and an alternative source of topsoil found.

14.2.3.2.4 Seed and Turf Establishment

Coordinate with Section 4.3 (Erosion Control) on turf seed and sod establishment.

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If the seeding or sodding timeframes in the specifications are unattainable due to schedule conflicts, develop and implement applicable stabilization placeholders until appropriate seeding or sodding dates are back within the defined timeframe.

14.2.3.3 Watering

Provide water that is free from impurities or substances that might injure the plant. After planting, water the planting area deeply. Newly planted trees and shrubs must receive adequate water during the establishment period.

Continue to water seeding areas and annual and perennial beds at least 30 Days when rainfall is not adequate to maintain soil moisture; do not let the top inch of soil dry out until the plants are well established.

Apply water in a manner that precludes washing or erosion.

14.2.3.4 Materials/Testing

Test all seed for purity, germination, and noxious weed seed content.

14.2.3.5 Instrumentation/Monitoring

Submit list of all equipment and calibration needs to survey and install plant materials.

14.2.3.6 Invasive Species Control

Remove invasive and noxious weeds or treat areas designated on the Noxious Weed Control Plan. Maintain maps indicating areas of noxious weed control and records indicating name of applicator; date/time and method of application; and herbicide(s) name, strength, and quantity used throughout the Project duration to ensure the following:

- Treatment of State-listed noxious weeds in areas left undisturbed
- Proper placement of weed-infested soil in areas disturbed by construction activities
- Topsoil treated with certain herbicides (those with residual soil activity) is not relocated to another part of the Project

Retain all pesticide (herbicide) application records and maps and submit them to the Department at Final Acceptance.

Herbicide applicator must carry current WI DATCP pesticide applicator certification and license in Category 6 – Right-of-Way and Natural Areas, and Category 5 – Aquatic and Mosquito, if applying in a WDNR-defined waterway.

14.2.3.7 Landscape Planting Surveillance and Care Cycles and Scouting Reports

Complete surveillance and care cycles for woody plants and native seeding throughout the growing season. Properly care for plants from time of planting until final acceptance of the Work. Provide post-planting monitoring, documentation (time-stamped photos), and care for woody

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plants and/or native seeding. Care for native seeding consists of watering, weeding, mowing, re-seeding, and trash removal. Care for woody plants is listed in Section 632.3.19 of the Standard Specifications.

For each care cycle, perform surveillance and care and provide scouting reports. Submit a surveillance and care cycle schedule at least 14 Days prior to planting. Provide schedule updates as necessary. Fill out the pertinent information required on the Scouting Report. Complete one report per site per care cycle.

14.2.3.8 Final Assessment Summary and As-Built Documents

Provide a final record and assessment of vegetative activities throughout the course of construction, including dates, descriptive photos, written performance summary, management efforts, and other relevant information critical to long-term maintenance of the Project. Provide legible as-built drawings in GIS or CAD-based format that incorporate GPS-located tree and shrub locations, as well as seeding and other understory boundaries. Coordinate transfer of legible Vegetation Assets information for the Project to BHM LACs to incorporate into their database. Annotate plans to convey if site conditions, plant species, or other factors will impact long-term maintenance for the landscape assets.

14.2.4 Landscape Deliverables

Table 14-1, which lists Deliverables identified in Section 14.2, is not intended to be exhaustive. It is the Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 14-1: Non-exhaustive List of Landscape Deliverables

Name	Acceptance or Approval	Section Reference
Visual Quality Management Plan (confirm if required)	Acceptance	14.2.2.1.1
Visual Impact Assessment (confirm if required)	Acceptance	14. 2.2.1.4
Vegetation Preservation/Protection and Removal Plan	Approval	14.2.2.1.2
Invasive Species Control Plan and updates (minimally 1x/yr)	Approval	14.2.2.2.9
In-Progress Landscape Plans	Acceptance	5.4.7.1
RFC (Final) Landscape Plans	Approval	5.4.9.1
As-Built Landscape Documents	Acceptance	5.4.9.8/14.2.3.8
Landscape Maintenance Plan	Acceptance	14.2.2.2.17
Landscape Planting Surveillance and Care Cycles	Acceptance	14.2.3.7
Pesticide (herbicide) application maps and records	Acceptance	14.2.3.6

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14.3 Erosion Control

14.3.1 Erosion Control Administrative Requirements

14.3.1.1 Erosion Control Standards

In the event of a conflict among the standards set forth in Book 3 relating to Erosion Control, follow the order of precedence as set forth below, unless otherwise specified:

- Transportation Construction General Permit (TCGP) WPDES Permit No. S-066800-1
- Wisconsin Administrative Code: TRANS 401
- WisDOT *Facilities Development Manual (FDM) Chapter 10*
- WisDOT Erosion Control Product Acceptability List (PAL)
- WisDOT *Construction and Materials Manual (CMM)*
- *WisDOT Highway Maintenance Manual (HMM)*
- Code of Federal Regulations, Title 23 (Highways), Chapter 1, Part 650, Subpart B, Erosion and Sediment Control on Highway Construction Projects
- *WDNR Standards Oversight Council Construction Standards*
- Remaining standards set forth in Book 3

14.3.1.2 Erosion Control Meeting Requirements

Meet with Region Stormwater and Erosion Control Engineer and DNR Liaison to review specific erosion control issues prior to the submittal of the DNR final concurrence, NOI for TCGP coverage, and the ECIP for the Project.

Notify the DNR Liaison when regularly scheduled weekly erosion control inspections will occur and when the weekly construction meetings occur.

14.3.1.3 Erosion Control Permits/Authorizations

Review and coordinate activities with past and ongoing Section 4 (Environmental Compliance) requirements for permitting-related erosion control. Provide a summary of required coordination activities and progress as part of each meeting addressing the topics bulleted below.

- WPDES Permit No. S-066800-1 (TCGP) Notice of Intent (NOI) and Notice of Termination (NOT) submittal through the DNR electronic permit system
- Erosion control plan and ECIP amendments due to changes in design, construction, operation, sequence, schedule, or phasing
- 401 Water Quality Certification

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14.3.2 Erosion Control Design Requirements

Apply erosion control design principles at the beginning of the development process. Refer to erosion control matrix, PAL, and FDM Chapter 10 to develop the erosion control plans. Submit the erosion control plans to the DOT Region SWEC for review and comment prior to submittal to the DNR Liaison.

14.3.2.1 Erosion Control Design Criteria

Integrate solutions to the following design issues into final plans.

14.3.2.1.1 Erosion Control

Provide complete and accurate plans that differentiate between temporary erosion prevention (interim, multiple soil, and water conveyance stabilizations over the life of the Contract) and permanent erosion prevention (completed when land disturbance is finally finished for that area).

Design temporary and permanent erosion and sediment control measures complying with the requirements of relevant sections in a manner that will not prohibit or compromise the installation, effectiveness, health, or design intent of permanent turf, other vegetation, or vegetative assets to be preserved.

Ensure proper and effective design through the use of the FDM Channel and Slope Erosion Control Matrices.

Do the following:

1. In areas where seeded turf will be mown or in areas of environmental sensitivity, follow WisDOT Standard Specification 628, except employing only natural netting rolled erosion control products (RECP), typically classified as urban mats.
2. Adjacent to wetlands, employ redundant sediment control and rapid erosion prevention control including hay bale/silt fence barriers, heavy-duty silt fence, sediment traps, topsoil windrows, or other practices as appropriate.
3. Provide natural netted rolled erosion control products for interim, temporary erosion prevention activities installed prior to the completion of final grading and landscape.
4. Provide dewatering systems that have at least a two-cell settling system with a filter bag, coagulant, and downstream erosion protection, or provide equivalent protection.
5. Design a clean water bypass system to prevent off-site upgradient runoff or streamflow from entering and contaminating the construction area.

14.3.2.1.2 Soils Management

Refer to 14.2.2.2.10 of the Landscape Section.

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14.3.2.1.3 Seed and Sod Establishment

Establish turf in all disturbed areas. Note on the RFC plan sheets the requirements for depth and location of topsoil reuse/placement, as well as any soil decompaction and soil amendment measures and their relation to each type of turf or planting area in the Project area. Restore vegetation in all temporarily impacted wetlands. Document vegetation coverage with photographs and narrative to demonstrate 70 percent coverage for delivering appropriate TCGP NOT, and submit to the Department PM.

Establish turf using the following sod types in the areas noted:

- Lawn sod: In all disturbed yards (residences and businesses)
- Salt-tolerant sod: Adjacent to all trails and sidewalks to one mow width (8 feet), transitioning to Seed Mix [xx-xxx], or between trail/sidewalk and curb section

Utilize all topsoil present on the Project within the Project limits. If additional topsoil is required, ensure topsoil meets requirements of Section 14.2.2.2.10, appropriate to the deficient area.

14.3.2.1.4 Maintenance Plan

Mow twice in a growing season (late May/early June and late August/early September) to reduce weed growth. Do not allow weeds to set seed. Repair eroded slopes.

14.3.2.2 Erosion Control Plans

14.3.2.2.1 Erosion Control Plan

Prepare erosion control plans and relevant special provisions for construction using the requirements found in the FDM, standard details, standard specifications, Standard Special Provisions, PAL, Bridge Manual, region best practices and engineering judgement. Submit the preliminary erosion control plans and special provisions to the Region SWEC and the DNR Liaison for review and comment. Incorporate the comments into the final plans and special provisions. Resolve plan/special provisions issues with the SWEC and DNR Liaison.

Add erosion control designs/special provisions to address specific site conditions such as redundant/robust erosion methods adjacent to sensitive resources, dewatering details, clean water bypass, limiting extent of open areas, and restoration of embankments. Construct embankment fills in a maximum of 10-foot vertical increments. Whenever embankment fills exceed 10 feet, complete final landscape and erosion control measures before proceeding. Complete restoration of each segment area and complete final restoration adjacent to sensitive areas as soon as possible.

14.3.2.2.2 Erosion Control Implementation Plan (ECIP)

Refer to Section 14.3.3.2.2. Contractor may complete this Work concurrently with the final plans and TCGP NOI submittal and the 401 water quality certification submittal, but no later than before 14 Days prior to the start of construction.

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14.3.3 Erosion Control Construction Requirements

14.3.3.1 General

14.3.3.2 Construction Criteria

14.3.3.2.1 Requirements

Follow all requirements of WisDOT Standard Specification 628, associated Region Standard Special Provisions, and Construction Details. Remove erosion control devices when the Project has reached Final Acceptance or as directed by the engineer. Requirements include, but are not limited to:

1. The Department will perform weekly and rainfall event inspections per the requirements in Trans 401, the TCGP, and CMM. Assign a qualified Design-Builder representative who is responsible for contractor erosion control Work to accompany The Department on the inspections.
2. Comply with erosion control orders directed by Department staff.
3. The Department will organize and store all relevant erosion control–related documents in an Erosion Control Binder that is readily available for Department, DNR, EPA, or stakeholder review. The binder will be tabbed using the following categories, and the appropriate documentation will be inserted in each tab.
    a. Temporary Suspension
    b. Erosion Control Orders
    c. Release Report Forms
    d. Weekly/Rainfall Erosion Control Inspection Reports
    e. ECIP Amendments
    f. Original ECIP and Approval Letter
    g. Certificate of Permit Coverage.
4. Install and maintain robust erosion control practices. Perform timely restoration to minimize the risk of sediment releases into waterways/wetlands/storm sewers and off the Project.
5. Report releases per Section 14.3.3.2.10.

14.3.3.2.2 ECIP and ECIP Amendments

Submit the ECIP form and attachments for the Project, including for each structure, borrow site, waste site, and other temporary support activities to the DOT Project Oversight team, the DOT SWEC, and the DNR Liaison. Submit the ECIP at least 14 Days before the start of construction. The Department and the DNR will review, comment on, and approve or deny the ECIP

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amendment. Do not do any ground-disturbing activities or use any borrow site, waste site, or temporary support site until written Department acceptance of the ECIP amendment for the site has been received.

Submit amendments to the ECIP using the ECIP form and attachments for the Project regarding all changes to the Project, including for each structure, selected sites, and other temporary support activities, as described in TCGP permit section 3.3.1.

1. If there is a change in design, construction, operation, or maintenance that has the reasonable potential to discharge pollutants and has not been addressed in the plans or ECIP.
2. If there is a change in the sequence, schedule, or phasing of construction.
3. The actions required by the plans fail to reduce the impacts of pollution carried by construction site stormwater runoff.

14.3.3.2.3 Borrow Materials within the Right-of-Way

Do not acquire borrow material within Department R/W and outside excavation limits without prior Department Approval. To request Department Approval, prepare and submit an amendment to the ECIP addressing site restoration, environmental impacts, material management, and other pertinent information such as access, operations, real estate, environmental, historical, and cultural impacts using the ECIP form. The Department will respond within 14 Calendar Days of receipt of the amendment. Additional information regarding the use of materials found on the Project is provided in CMM 231.

14.3.3.2.4 Waste Materials within the Right-of-Way

Do not dispose of waste material on R/W without prior Department Approval. To request Department Approval, prepare and submit an amendment to the ECIP addressing site restoration, environmental impacts, material management, and other pertinent information such as access, operations, real estate, environmental, historical, and cultural impacts using the ECIP form. The Department will respond within 14 Calendar Days of receipt of the amendment.

The Design-builder assumes ownership of all material to be disposed of off-Site, except as otherwise noted in the Contract Documents.

Do not remove topsoil from the Site. If excess topsoil is available, grade the material over turf establishment areas within Department R/W.

Additional information regarding the disposal of materials is provided in Standard Specification 205.3.12 and CMM 320.9.

14.3.3.2.4.1 *Soils Management*

Refer to Section 14.2.3.2.3.

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14.3.3.2.4.2 *Seed and Turf Establishment*

For slopes of 3:1 or steeper, roughen existing soils before placement of Topsoil or Salvaged Topsoil so topsoil will bond with existing soil. BMPs for stabilization methods will be defined by Standard Specification Section 631.

14.3.3.2.5 Watering

Per Standard Specification 630.3.6, continue to water seeding areas and annual and perennial beds at least 30 Days when rainfall is not adequate to maintain soil moisture. Soil moisture must be maintained within 20 percent and 40 percent limits as determined using a soil moisture meter.

Apply water in a manner that precludes washing or erosion.

Water seeded areas per specifications. Do not water dormant seeding when the seed is placed. Resume seed watering in the spring per specifications.

14.3.3.2.6 Notice of Termination Requirements

The Project must be covered by 70 percent vegetation to apply for the NOT.

14.3.3.2.7 Materials/Testing

Provide documentation to demonstrate that all erosion control products meet the PAL.

14.3.3.2.8 Inspections and Deficiency Corrections

The Department will perform the required erosion control inspections. The Design-Builder's erosion control representative will accompany the Department erosion control inspector. The Site must be inspected every 7 Days, or within 24 hours after a precipitation event equal to or greater than 0.5 inch, including weekend Days, regardless of whether the Design-Builder is working or not. The Department erosion control inspector will provide a copy, upon completion, of the report and any necessary erosion control orders or emergency orders to the Design-Builders erosion control representative. The Design-Builder will take the required action outlined in the order within the timeframes required by the order, and sign and date the orders to indicate order completion. The Design-Builder erosion control representative will report directly to the Department erosion control inspector.

14.3.3.2.9 Winter Shutdown Measures

Approximately 1 month before suspending grading operations for the winter, arrange and conduct a site review with the DOT Oversight Engineer, Regional SWEC, and DNR Liaison to review anticipated erosion control needs. Prepare a winter ECIP amendment that provides details for site stabilization and maintenance over the winter months. Complete final landscape and erosion control on all completed sections prior to winter shutdown.

TEMPLATE

14.3.3.2.10 Sediment Releases

Sediment releases or discharges are movements of pollutants or sediments from the Project Site or selected site as a result of erosion or runoff. Sediment is defined as settleable solid material that is transported by runoff, suspended within runoff, or deposited by runoff away from its original location (TRANS 401.04(8) and (29)).

If sediment enters waters of the State or wetlands, whether directly or indirectly, or leaves the R/W, immediately suspend the operations that caused the release and immediately implement corrective actions to prevent further releases.

For releases to waters of the State or wetlands, whether directly or indirectly, submit a removal and restorative action plan to Project staff, SWEC, and DNR Liaison within 24 hours. After plan approval, complete the planned actions.

For releases off the R/W but not to waters of the State or wetlands, submit a corrective action plan to Project staff within 24 hours. After plan approval and with appropriate permissions from the affected property owner(s), complete the planned actions.

As described in TRANS 401.12, pay all costs associated with a prohibited discharge from a Project Site or a selected site if the Design-Builder was not in compliance with the Contract documents as described in TRANS 401.12(3)(a)(1.), or if the performance under the contract documents has fallen behind schedule, as described in TRANS 401.12(3)(a)(2.)

14.3.3.2.11 Final Coverage Documentation of Permanent Erosion Control Practices

Provide documentation for 70 percent vegetation coverage. Provide a final record and assessment of permanent erosion mat, riprap, articulate concrete blocks, and any other permanent systems through the course of construction, including dates, descriptive photos, written performance summary, management efforts, and other relevant information critical to long-term maintenance of the Project.

Include in the as-built plans riprap size and location of riprap swales and TRM composition and location.

14.3.4 Erosion Control Deliverables

Table 14-2, which lists Deliverables for Erosion Control identified in this section, is not intended to be exhaustive. It is the Contractor’s responsibility to determine and submit all Deliverables as required by the Contract.

TEMPLATE

Table 14-2: Non-exhaustive List of Erosion Control Deliverables

Name	Acceptance or Approval	Section Reference
Preliminary Erosion Control Plans and Erosion Control Special Provisions (submitted to SWEC and DNR Liaison for review and comment).	Approval	14.3.2.2.1
Final Erosion Control Plans and Erosion Control Special Provisions (as part of entire plan set and special provisions).	Approval	14.3.2
Source of Material	Acceptance	14.3.3.2.7
Notice of Intent Documentation (TCGP)	Acceptance	14.3.1.3
Erosion Control Implementation Plan (ECIP) and ECIP Amendments	Approval	14.3.3.2.2
Notice of Termination Documentation (TCGP)	Acceptance	14.3.2.1.3
Permanent Erosion Control Practice As-built Plans	Acceptance	14.3.3.2.11

TEMPLATE

15 Visual Quality Management and Aesthetics

15.1 General

This section includes the visual quality design, construction, and management requirements of the Project.

15.2 Administrative Requirements

15.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to visual quality management and aesthetics, follow the order of precedence set forth below, unless otherwise specified:

- WisDOT Facilities Development Manual (FDM)
- WisDOT Bridge Manual
- WisDOT Bridge Manual Standard Drawings
- AASHTO, Bridge Aesthetics Sourcebook, 2010
- FHWA *Flexibility in Highway Design*
- FHWA Guidelines for the Visual Impact Assessment of Highway Projects
- AASHTO *A Policy on Geometric Design of Highways and Streets*
- WisDOT Highway Maintenance Manual (HMM)
- American Society of Civil Engineers *Practical Highway Esthetic*s
- Secretary of the Interior's Standards for the Treatment of Historic Properties
- Remaining standards set forth in Book 3

15.2.2 Visual Quality Manager

Designate a Visual Quality Manager who reports to the Design-Build PM. This individual must be available to be on Site during design and construction activities involving visual quality issues. The Visual Quality Manager is responsible for the following:

- Implementing the Visual Quality Management Plan (Section 15.2.4)
- Overseeing and coordinating production of the Visual Quality Plan (VQP)
- Implementing the aesthetic concepts of the VQP
- Coordinating visual quality issues with the VQAC, the Department, the BHM Landscape Architect and the Design-Builder's design and construction teams.

TEMPLATE

15.2.3 Meeting Requirements

15.2.3.1 Visual Quality Advisory Committee

The Visual Quality Advisory Committee (VQAC) has been assembled by the Department and consists of representatives from the following:

- Bureau of Structures
- Choose an item. Region
- Bureau of Highway Maintenance Landscape Architect
- Stakeholders as deemed appropriate by the Department to participate in the final design

At the onset of the design phase of the Project, the VQAC will meet with the Visual Quality Manager to review the VQMP, and to be informed of VQAC's role in the development of the design and construction of the Project. The VQAC members will have opportunity to review and comment on the VQMP. The VQAC will be called upon to participate in decisions related to changes or modifications to the design that differ from the VQP and this section during the design and construction of the Project. Members of the VQAC are the link between their respective communities or agencies and the Design-Builder, and have the capacity to make recommendations on behalf of their residents, businesses, or constituents.

15.2.4 Visual Quality Management Plan

Provide a VQMP that defines the following:

- Methods for coordinating and interacting with the Department.
- The role of the Visual Quality Manager and the Department in identifying areas or elements of the Project that present opportunities or concerns in the development of a visually acceptable design.
- Authority of the Visual Quality Manager and the process for coordinating input from the Department and the VQAC with the Design-Builder's design and construction teams.
- Responsibilities and authority of the Visual Quality Manager in reviewing overall Project design details, mock-ups, samples, and other visual quality-related elements.
- Process for maintaining the record of visual quality recommendations and decisions throughout the Project.
- A list of VQAC members (provided by the Department), their contact information, a process and proposed schedule for interacting with them.

TEMPLATE

15.2.5 Equipment/Software

15.2.6 Permits/Authorizations

15.3 Design Requirements

15.3.1 General

This section includes design requirements for elements that will affect the Project's visual quality, which are referred to as aesthetic elements in this section.

15.3.2 Investigations/Supplemental Work

15.3.3 Design Criteria

15.3.3.1 Visual Quality Details

Include details with the RFC Documents specifying and explaining aesthetic elements to be used on the Project. Aesthetic details include:

15.3.3.2 Aesthetic Elements

Develop designs for and construct all aesthetic elements of the Project in compliance with this section, and in the VQP described in Section 15.3.4.1.

Do not allow any other disciplines to design aesthetic elements prior to VQP approval.

Design and construct a Project that responds to the Project's context and maintains or enhances existing visual quality. Develop designs that create visual harmony with the natural environment, visual order with the community setting, and design coherence within the highway corridor. Coordinate the architectural character and treatments for all elements within the Project to achieve a consistent architectural vision or family of complementary features.

15.3.3.2.1 Landscape

Reference Section 14 (Landscape and Erosion Control), and FDM Chapter 27 (Planting and Aesthetic Design), for additional guidance on landscape development including Visual Impact Assessments.

15.3.3.2.2 Bridges

This section applies to all engineered structures constructed as part of the Project that include a superstructure resting on a substructure, and that carry vehicular, bicycle, or pedestrian traffic.

15.3.3.2.3 Retaining Structures

This section applies to any structure that is engineered to hold earth in a position steeper than a natural angle of repose. Include retaining wall locations, horizontal alignments, 1:1 elevations, wall type(s), surface texture, finish, and color in the Project VQP.

TEMPLATE

- To the extent practicable, use retaining structures only in areas where such structures reduce adverse impacts to natural or cultural environmental assets, or where they will eliminate or reduce the need for additional R/W.
- Design retaining structures with jointing that matches the simulated coursing or jointing of any surface rustication or architectural treatment.

15.3.3.2.4 Noise Walls

This section applies to all constructed or installed elements meant to reduce the ability of sensitive receptors (as defined by federal and State regulations) to hear sounds generated by traffic moving on the proposed or reconstructed highway.

- Design and construct the noise wall to appear as illustrated in Exhibit . Prepare sufficient illustrations to fully communicate the visual character of the proposed noise wall, including elevations, Material designation, textures, and colors for all components of the wall for inclusion in the VQP. During the VQP preparation, present the design to the VQAC for evaluation and approval.
- For finish of newly constructed noise walls, follow the manufacturer's recommendations for surface preparation and application and the Department's guidance regarding approved products and procedures. Ensure that final noise wall Design Documents define elements to be constructed as a mock-up for approval by the Department.

15.3.3.2.5 Traffic Barriers

This section applies to all constructed devices used to redirect errant vehicles away from obstacles, including steep embankments, bridge piers and abutments, sign structures, trees, and other immovable objects. It also includes devices used to separate modes of transportation, such as motorized vehicles from pedestrians or buses from automobiles. Traffic barriers may also separate different directions of travel. Curbs are not considered traffic barriers.

- Bridge Parapets and Railings – Any standard parapet or traffic railing from the WisDOT Bridge Manual is considered a participating item.
- Street Names – Street names recessed in the bridge parapet and stained for visibility should be included on the following bridges:

15.3.3.2.6 Signing

This section applies to all signs installed within the R/W as part of the Project that are maintained by the Department or other governmental agencies. This includes regulatory, advisory, directional, service, logo, and attraction signs.

- Do not mount signs on bridges unless replacing existing signs on the same structure.
- When mounting signs on bridge(s) required to service motorists passing under the bridge(s), attach the signs in an unobtrusive manner per WBM 39.4.2.5

TEMPLATE

15.3.3.2.7 Pedestrian Railings

- Design and construct pedestrian railing for Bridge and for other site locations, as required, as illustrated in Exhibit .
- Design and construct pedestrian railing for trail facilities railings.

15.3.3.2.8 Surface Water

This section applies to any construction that results in creating, eliminating, altering, or obscuring any surface water features, including both standing and running bodies of water. Standing bodies of surface water include those commonly referred to as lakes, ponds, marshes, fens, swamps, wetlands, retention ponds, and detention ponds. Running bodies of surface water include those commonly referred to as rivers, streams, creeks, channels, canals, swales, and ditches, or other visible drainage features.

15.3.3.2.9 Slope Protection

This section applies to any non-structural treatment engineered to hold earth in a position equal to or less than a natural angle of repose. Slope protection includes paving, paved berms, riprap, and any bioengineered or vegetative method of slope stabilization.

- To the extent practicable, avoid the use of paving, riprap, or other engineered slope protection in areas where light and water conditions would adequately support vegetative cover that would stabilize slopes and control erosion.
- Provide concrete slope paving and concrete walk in areas where natural light and water conditions will not support vegetation, especially beneath bridges. See Section 13 (Structures) regarding slope protection in front of bridge substructures.
- Employ on slope protection areas a consistent surface treatment or family of complementary surface treatments that are compatible with the overall theme of the corridor.
- Provide a paved surface treatment for boulevards that are less than 6 feet wide.

15.3.3.2.10 Culverts

This section applies to all structures that traverse beneath a roadway, trail, driveway, or similar facility to convey something that would impede traffic if allowed to cross the road, trail, or driveway at grade.

TEMPLATE

15.3.3.2.11 Lighting, Signals, and Utilities

15.3.4 Reports and Plans

15.3.4.1 Visual Quality Plans

Produce a VQP that sets forth design intention and details for elements noted in Section 15.3.3.2 (Aesthetic Elements). Comply with the VQP and this section when developing RFC documents for the Project.

Include in the VQP a descriptive narrative and graphic exhibits thoroughly illustrating all aesthetic details to be employed on the Project. Includes color palette using AMS Standard Color Numbers, texture, and details, such as Plans, elevations, sections, and perspective sketches of all aesthetic details.

Present the draft VQP to the VQAC for its consent prior to submittal to the Department. Submit one hardcopy in a binder, with the words “Draft Visual Quality Plan,” and PDF of complete document. Include in the draft VQP all drawings and text necessary to convey the requirements of this section.

Revise VQP as needed, and within 10 Days of the Department’s approval, submit one hardcopy of the document in a three-ring binder with waterproof cover that includes the words “Approved Visual Quality Plan,” the name of the Design-Builder, the name of the Project, and the date of the Department’s approval. Print document on 8.5-inch by 11-inch bond paper or 11-inch by 17-inch bond paper accordion-folded to form an 8.5-inch by11-inch page. Submit a complete PDF of the Approved VQP.

Obtain approval for any aesthetic elements not covered in the VQP that the Design-Builder intends to incorporate in the Project design. Approval of any such elements is required; these designs and approvals then become part of the Approved VQP for the Project.

15.4 Construction Requirements

15.4.1 General

15.4.2 Construction Criteria

15.4.3 Materials/Testing Requirements

Provide mock-ups or samples for the items described in this section a minimum of 15 Days prior to construction or installation of each element.

Mock-ups or samples Accepted by the Department become the reference standard(s) for the Project. Maintain the reference standard(s) undisturbed until Substantial Completion of the Project.

TEMPLATE

15.4.3.1 Retaining Structures

Construct a minimum 4-foot by 4-foot mock-up for each type of retaining wall as indicated by the VQP for acceptance by the Department.

15.4.3.2 Bridges

Construct a minimum 4-foot by 4-foot mock-up for each staining and architectural concrete texture as indicated by the VQP or proposed by the Design-Builder.

15.4.3.3 Noise Walls

Construct a 3-foot by 5-foot minimum test panel of the Project noise wall.

15.5 Deliverables

Table 15-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 15-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Draft Visual Quality Management Plan	Approval	15.2.4
Approved Visual Quality Management Plan	Approval	15.2.4
Draft Visual Quality Plan	Approval	15.3.4.1
Approved Visual Quality Plan	Approval	15.3.4.1
Visual Quality Mock-ups and Samples	Approval	15.4.3

TEMPLATE

EXHIBITS

All exhibits are provided as electronic files.

Exhibit 15-A –

TEMPLATE

16 Signing, Pavement Marking, Traffic Signals, and Lighting

16.1 General

This section describes the design and construction requirements for permanent signing, permanent pavement marking, permanent signalization, and permanent lighting for the Project. It also identifies traffic-related equipment or Materials that will be provided by the Department or other agencies for the Contractor's use.

16.2 Administrative Requirements

16.2.1 Standards

16.2.1.1 General Standards

In the event of a conflict between the standards set forth in Book 3 relating to signing, pavement marking, traffic signals, and lighting, follow the order of precedence set forth below, unless otherwise specified:

- *WisDOT Facilities Development Manual (FDM)*
- *WisDOT Bridge Manual*
- WisDOT Standard Detail Drawings (SDDs)
- *WisDOT Sign Plate Manual*
- *WisDOT Traffic Engineering, Operations and Safety Manual (TEOpS)*
- *WisDOT Traffic Signal Design Manual (TSDM)*
- *Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD)*
- *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*
- *Remaining standards set forth in Book 3*

16.2.1.2 Permanent Signing Standards

- *WisDOT Sign Code Manual*
- WisDOT Sign Plate Manual
- WisDOT CADDS Sign Design Guidelines Manual
- *Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD)*
- *WisDOT Facilities Development Manual (FDM)*

TEMPLATE

- *WisDOT Traffic Engineering, Operations, and Safety Manual (TEOpS)*
- WisDOT Standard Detail Drawings (SDDs)
- WisDOT Sample Detail Sheet (Permanent Signing)
- Remaining standards set forth in Book 3

16.2.1.3 Permanent Pavement Marking Standards

- *Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD)*
- *WisDOT Facilities Development Manual (FDM)*
- *WisDOT Traffic Engineering, Operations, and Safety Manual (TEOpS)*
- WisDOT Standard Detail Drawings (SDDs)
- WisDOT Sample Detail Sheet (Pavement Marking)
- Remaining standards set forth in Book 3

16.2.1.4 Permanent Traffic Signal Standards

- National Electric Code
- Wisconsin Electrical Code
- *WisDOT Traffic Signal Design Manual (TSDM)*
- *WisDOT Traffic Engineering, Operations, and Safety Manual (TEOpS)*
- WisDOT Standard Detail Drawings (SDDs)
- WisDOT Sample Detail Sheet (Traffic Signal)
- Remaining standards set forth in Book 3

16.2.1.5 Permanent Lighting Standards

- National Electric Code
- Wisconsin Electrical Code
- Local codes and ordinances
- *WisDOT Traffic Engineering, Operations and Safety Manual (TEOpS)*
- WisDOT Standard Detail Drawings (SDDs)
- AASHTO *Roadway Lighting Design Guide 2018 Edition*
- *ANSI/IESNA Roadway Lighting RP-8-18*
- *WisDOT Sample Detail Sheet (Lighting)*
- Remaining standards set forth in Book 3

TEMPLATE

16.2.2 Meeting Requirements

16.2.3 Equipment/Software

16.2.3.1 Signing

The Design-Builder may request sign plates per FDM 11-50-55.
DOTBTOSignDetails@dot.wi.gov

If the Design-Builder is to design sign plates, use SignCAD for the design of special signs on the Project. BTO will have a minimum of 3 weeks to review prior to Project use.

16.2.3.2 Traffic Signals

Use the latest approved version traffic modeling software listed in the WisDOT TEOpS manual for traffic operations analysis and simulation.

16.2.3.3 Lighting

Use the latest version of Lighting Analysis AGI32 software as identified in the WisDOT TEOpS manual to analyze light distributions of different lighting configurations.

16.2.4 Permits/Authorizations

16.3 Design Requirements

16.3.1 General

Identify on design plans the materials and equipment to be provided by the Department or others as detailed in Section 16.4.

16.3.2 Investigations/Supplemental Work

16.3.2.1 Signing Inventory

Conduct an inventory of all in-place signing in the Project. Prepare an in-place signing inventory layout (Exhibit 16-C).

16.3.2.2 Photometric Analysis

Obtain necessary approvals(s) before beginning lighting design with the Regional Lighting Engineer in accordance with the TEOpS Manual.

Complete a photometric analysis for Department lighting in compliance with the requirements of this section to confirm that the illumination levels provided by the Contractor’s design conform with Contract requirements.

TEMPLATE

Include average light levels in foot-candles, average/minimum uniformity, veiling luminance ratio (Lmax/Lavg), light pole locations and heights, and luminaire types, including catalog number, quantities of each luminaire, and AGI32 calculations.

Provide a level of illumination as outlined in the TEOpS Manual including average maintained illuminance, average/minimum uniformity, and veiling luminance ratio.

Include light loss factor for LEDs based on the values found on the Department-Qualified Product List (QPL) for the approved luminaire used in analysis.

Follow light trespass local ordinances, if they exist.

Account for the three-dimensional aspects of the roadway with respect to the positioning of the illumination assemblies (e.g., roadways, ramps, overpasses are typically at varying vertical and horizontal distances from the luminaires being used to light the roadways).

Submit the Photometric Analysis at least 20 Working Days before beginning any final design for permanent lighting. The Department will respond within 10 Working Days of receipt.

16.3.3 Design Criteria

16.3.3.1 Temporary Traffic Signals

- Design temporary traffic signal and prepare temporary traffic signal plans.
- Reference the construction staging plans when designing the location of the poles, cables, and signal heads.
- Include vehicle detection to avoid using pre-timed operations.

Provide temporary signals at:

[location]

16.3.3.1.1 Material Requirements

16.3.3.2 Temporary Lighting

- Design all temporary lighting and prepare temporary lighting Plans.
- Maintain current levels of roadway illumination for all roadway segments and interchanges that are currently lit, which may require the construction of temporary lighting.
- Maintain current levels of illumination for pedestrian and bikeway facilities and crossings that are currently lit, which may include the need for temporary lighting.
- Provide all materials and equipment for temporary lighting installations.
- In the clear zone, provide only lighting units that are breakaway or protected from crash potential.
- Provide maintenance for the temporary lighting system.

TEMPLATE

16.3.3.3 Permanent Signing

Design and construct signs that conform to the requirements of Standard Specifications sections 634-638.

Contact Wisconsin Logos at (844) 496-9163 for existing Specific Information Signs (SIS) with Wisconsin Logos Inc. that will be included as part of the permanent signing design.

Temporary signing information can be found in Section 18 (Traffic Control).

The following sign structures may be reviewed by the Contractor for salvaged use on the Project. Any salvaged sign structures must meet vertical clearance and design requirements per Section 15 (Visual Quality Management and Aesthetics) for the proposed permanent sign area.

[insert data]

16.3.3.4 Permanent Pavement Marking

Design removal and permanent pavement markings that conform to the requirements of Standard Specifications sections 646 and 648. Temporary pavement marking information can be found in Section 18 (Traffic Control).

16.3.3.5 Permanent Traffic Signals

Design removal and permanent traffic signals that conform to the requirements of Standard Specifications sections 651-658.

Provide new fully actuated signal systems at the following locations:

[location]

Comply with the additional signal systems requirements in Exhibit 16-A (Traffic Signal Design Detail Form).

16.3.3.6 Permanent Lighting

Design and construct lighting in accordance with the requirements in Exhibit 16-B ([insert data]). Provide [insert data] luminaires with a [insert data] mast arm and a [insert data] pole height from the WisDOT Qualified Products List. Provide ([insert data]) luminaires with a ([insert data]) mast arm and a ([insert data]) pole height from local agency for non-WisDOT lighting.

Remove and replace any existing lighting impacted by construction. Remove and replace the existing wiring from the lighting unit impacted to the nearest handhole/light pole or the next handhole/light pole not impacted. Provide new wiring unless re-use of existing wiring is approved by the Department.

16.3.3.6.1 Lighting Under Structures (Underdeck Lighting)

Provide underdeck lighting on the Department roadways as specified by the Region Lighting Engineer.

TEMPLATE

Provide and install the Department underdeck lighting from the WisDOT-QPL. Match levels of illumination under the bridge to that of the roadway entering and exiting the underpass.

16.3.3.6.2 Spillover Light

Provide only WisDOT-Qualified luminaires from the WisDOT-QPL. Work with the Department to mitigate citizen complaints resulting from the lighting systems.

16.3.3.6.3 High Mast Lighting

Meet light level requirements for high mast lighting as specified above. Luminaires must be selected from the WisDOT-QPL.

16.3.3.6.4 Project-Specific Lighting Requirements

Design all new permanent lighting systems to be [XXX/XXX]: volts.

16.3.4 Reports and Plans

Follow FDM Chapter 15 for guidance on plan preparation and example plan sheets for the following section.

16.3.4.1 Temporary Traffic Signal Plan Requirements

Prepare and submit Temporary Signal Plans to the Department before initiating construction. The Department will respond within 14 Working Days of receipt.

Include the following, at a minimum, in the Temporary Traffic Signal Plan in accordance to TSDM:

- Temporary Signal Plan Sheet(s) for each stage
- Temporary Sequence of Operations Sheet
- Temporary Traffic Signal Interconnect/Communications Plan (if needed)
- Communications Schematics (if needed)

16.3.4.2 Temporary Lighting Plans

Prepare and submit Temporary Lighting Plan to The Department before initiating construction. The Department will respond within 14 Working Days of receipt.

Include the following, at a minimum, in the Temporary Lighting Plan in accordance to the TEOps Manual:

- Temporary Lighting Plan Sheet(s)

16.3.4.3 Permanent Signing Plan Requirements

Submit Preliminary Signing Plan for complex projects (spacing/ground mounted), if applicable.

TEMPLATE

Develop a Permanent Signing Plan for the Project that includes all necessary guide signs, warning signs, regulatory signs, dynamic message signs (DMS), object markers, and delineators. Also include design modifications to signage outside the limits of the Project that are rendered inaccurate, ineffective, confusing, or unnecessary by the Project. Include in the modifications the addition, removal, or alteration of sign panels and sign structures. Include in the Permanent Signing Plan all signing necessary for the Project inside and outside of the Project limits. Needs identified for signage outside the Project limits will not be the responsibility of the Contractor to construct unless the signs can reasonably be moved inside the limits.

Include the following, at a minimum, in the Permanent Signing Plan:

- Sign locations; including new signs, removed signs, and signs to remain
- Proposed pavement markings
- Panel legends
- Proximity to ITS devices, including DMS locations
- Types of proposed sign structures
- Permanent signing proposed on bridges
- Signal system mast arm/monotube arm sign legends

Please send signing reviews to DOTBTOSignDetails@dot.wi.gov

16.3.4.4 Permanent Pavement Marking Plan Requirements

Prepare permanent pavement marking plans that show center line striping, edge line striping, lane line striping, crosswalks, stop lines, arrows, legends, symbols, and other markings for the Project. Provide for modifications to pavement markings outside the Project construction limits that are rendered inaccurate, ineffective, confusing, or unnecessary by the Project. Include in the modifications the addition, removal, or alteration of pavement markings. Include in the Plans all pavement markings necessary for the Project inside and outside the Project construction limits.

Include the following, at a minimum, in the Permanent Pavement Marking Plan:

- New and removed pavement markings

16.3.4.5 Permanent Traffic Signal Plan Requirements

the Department BTO must review and approve the traffic signal plans prior to construction documents being released for construction.

Include the following, at a minimum, in the Permanent Traffic Signal Plan in accordance to TSDM:

- Proposed Plan Sheet(s)
- Sequence of Operations Sheet

TEMPLATE

- Cable Routing Sheet
- Traffic Signal Interconnect/Communications Plan
- Communications Schematics
- Miscellaneous quantities for electrical items
- Engineering Estimate for electrical items
- Special provisions pertaining to electrical items
- Signal Removal Plans
- Details of non-standard items
- List of SDDs, general construction notes, and construction details pertaining to electrical items.

16.3.4.6 Permanent Lighting Plan Requirements

Include the following, at a minimum, in the Permanent Lighting Plan:

- Proposed Plan Sheet(s)
- Wiring Diagram
- Miscellaneous quantities for electrical items
- Engineering Estimate for electrical items
- Special provisions pertaining to electrical items
- Details of non-standard items
- List of SDDs, general construction notes, and construction details pertaining to electrical items
- Roadway, Area, and Pavement Classifications used in the design
- Legend describing the Luminaires, poles, arms, cabinet, and circuit information
- Luminaire symbols will include location and circuit information
- System wiring diagram including conduit, conductor, and circuit information for all conduit segments
- Maintenance Authority

16.3.4.7 Permanent Signing Released for Construction Documents

After the Permanent Signing Plan is Approved by the Department, create the RFC Documents.

Coordinate pictorial drawings and fabrication details from the BTO Traffic Design Unit at DOTBTOSignDetails@dot.wi.gov.

TEMPLATE

Include roadway layout sheets showing pavement marking lines and messages (with no labels).

Send SignCAD files for unique signs to be archived to the Department at DOTBTOSignDetails@dot.wi.gov.

16.3.4.8 Permanent Pavement Marking Released for Construction Documents

Include the following in the permanent pavement marking RFC Documents:

- A plan view of the entire Project or roadway segment to have pavement markings on individual Plan sheets at a scale acceptable to the Department. Typical sections representative of pavement markings will not be accepted.
- Identification of pavement markings to be removed.
- Identification of existing pavement marking to remain in place.
- All new pavement markings identified by Material type, color, and line width.
- Design drawings other than the Department Standard Design Detail drawings that show details of pavement markings, tapers, transitions, etc.

16.3.4.9 Permanent Traffic Signal Released for Construction Documents

At a minimum, include the following in the signal RFC Documents:

- Construction details and Standard Detail Drawings
- Revised and permanent intersection layouts
- Cable Routing Sheet
- Documentation regarding source of power and coordination with the local power company
- Traffic Signal Removal Plan
- For Information Only Plan
- Documentation and calculations for monotube wind loading (only needed for non-standard monotubes)
- Traffic signal interconnect/communications layout
- Documentation showing coordination with the City/County

16.3.4.10 Permanent Lighting Released for Construction Documents

At a minimum, include the following in the lighting RFC Documents:

- Approved Department lighting luminaires and permits
- Lighting poles as specified, including foundation, bases, pole heights, luminaire arms, and luminaires
- Service cabinet types as required

TEMPLATE

- All wire, cable, and terminations needed for the complete operation of the lighting system
- Conduit, pull boxes, and junction boxes required for installation
- Standard Design Details
- Salvage and removal
- Lighting layouts
- Wiring diagrams
- Documentation regarding source of power and coordination with the local power company

16.4 Construction Requirements

16.4.1 General

Use materials listed on the WisDOT-APL/QPL for signing, pavement markings, signals, and lighting unless specified in Section 16.3 (Design Requirements). See the following website for the WisDOT-APL/QPL: https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/appr-prod/default.aspx.

Order traffic signal and lighting equipment at a minimum of [XX] months in advance of installation. Order steel traffic signal and lighting equipment at a minimum of [XX] months in advance of installation. This lead-time is necessary to order equipment.

Order Type 1 signs at a minimum of [XX] Days in advance of installation. Order I-beams galvanized at a minimum of [XX] Days in advance of installation.

The Department will provide the following Materials for this Project:

- Traffic Signal Cabinet
- [material/equipment]

The following Materials are required to be used on this Project:

[material/equipment]

16.4.1.1 Temporary Traffic Signals Shop Drawings

Include the following in shop drawings and product data:

- Poles, mast arms, overhead cable, and signal heads
- Service cabinets, if required
- Luminaires, if required
- Ballasts, if required, and photoelectric controls
- Fuse holder kits, fuses, and insulating boots

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- Vehicle signal indications and lenses
- Pedestrian signal indications, lenses, and housings

16.4.1.2 Temporary Lighting Shop Drawings

Include the following in shop drawings and product data:

- Poles and mast arms for each type and size
- Service and control cabinets, including their physical arrangement, dimensions, internal components, and wiring diagrams
- Luminaire
- Transformer breakaway base

16.4.1.3 Permanent Traffic Signal Shop Drawings

Include the following in shop drawings and product data:

- Poles, mast arms, monotubes, traffic signal standards (by type and size), and pedestals
- Service cabinets, if required
- Luminaires, if required
- Ballasts, if required, and photoelectric controls
- Paint (prime and finish)
- Fuse holder kits, fuses, and insulating boots
- Loop detector splice kits
- Vehicle signal indications and lenses
- Pedestrian signal indications, lenses, and housings

16.4.1.4 Permanent Lighting Shop Drawings

Include the following in shop drawings and product data:

- Poles and mast arms for each type and size
- Service and control cabinets, including their physical arrangement, dimensions, internal components, and wiring diagrams
- Luminaire
- Transformer breakaway base

16.4.1.5 As-Built Drawings

See Section 5 (Quality Management) for As-Built requirements, along with Section 9 (Land Surveying) for facilities that are required to be surveyed.

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16.4.2 Construction Criteria

16.4.2.1 Temporary Traffic Signals

Provide 3-day notice to the Department prior to implementing temporary signal phasing for the Department's inspection.

Provide signal timing plans that optimize the signal timing to account for changes in traffic control schemes for all signal systems within the Project limits impacted by the Design-Builder's traffic control. Obtain approval of the Plans from the agency operating the signals 20 Working Days prior to implementation.

The contractor will enter the timing parameters into the signal controller. The contractor will be responsible for the operation and maintenance of the signal controllers and signal controller cabinets for temporary signals.

16.4.2.1.1 Operation and Maintenance

Maintain all components of the temporary signal systems. Contractor will provide and install signal timing for temporary traffic signals. Contractor to remove all temporary signal system installations upon completion and operation of the new permanent signal systems from the first day of construction until the permanent signals are installed and operational.

16.4.2.2 Temporary Lighting

If screw-in bases and poles are used for temporary lighting, assume ownership of the bases, poles, and accessories. If wooden poles are used, remove the poles before Substantial Completion and assume ownership of them.

16.4.2.3 Permanent Signing

Mark locations of the proposed signs in the field and conduct a construction design review with the Department for concurrence prior to installation.

16.4.2.3.1 Sign Removal

Coordinate with Wisconsin Logos Inc. for them to remove existing SIS signs on freeways. Contact Wisconsin Logos at (844) 496-9163 at least 14 Days before the signs need to be removed.

16.4.2.4 Permanent Pavement Marking

Construct pavement markings that conform to the requirements of Standard Specifications Sections 646 and 648.

16.4.2.5 Permanent Traffic Signal

Use non-metallic conduit (NMC) for all signal system conduit, except for any conduit attached to bridges. For conduit attached to bridges, coordinate with Region Structures and Traffic group to

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determine conduit type and placement. Ensure all signal system conduit under roadways is a minimum of 3 inches in diameter.

Contact the Region electrical field unit [XXX-XXX-XXXX] to have the pull boxes and conduit runs inspected 5 Working Days prior to placing signal cable into the system.

16.4.2.5.1 Permanent Traffic Signal Electrical Service

Provide all sources of power and obtain the Department's approval for locations. Coordinate with the local power supplier to provide the power service connection at least 2 weeks prior to request service connection. Coordinate the location and number of sources of power with any public partner maintenance agreements. Place location of sources of power to allow for the appropriate electrical billing of each public Utility. Contact the electric Utility to determine the source of power.

Install the electrical service conforming to local utility requirements. Furnish the utility with a wiring affidavit, certifying that the service was installed conforming to the WSEC.

16.4.2.5.2 Operation and Maintenance

the Department will provide and install signal timing for revised and permanent signals.

16.4.2.5.3 Traffic Signal Salvage

Salvage the following items from the existing signal systems:

- [material/equipment]

Deliver the salvaged items to [name of agency]:

[contact name]
[agency]
[address 1]
[city]
Phone: [phone]

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

Notify the Department's Electrical Field Unit at [XXX-XXX-XXXX] at least 5 Working Days prior to the removal of the traffic signals. Complete the removal Work as soon as possible following shutdown 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.

Assume Contractor ownership of items not salvaged and remove items off the Department R/W.

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16.4.2.6 Permanent Lighting

Provide the Department and [name of agency] with separate lighting systems and separate electrical feeds.

Provide maintenance for permanent lighting installations under the Contract until Final Acceptance.

16.4.2.6.1 Permanent Lighting Source of Power

Provide all sources of power and obtain WisDOT approval for locations. Coordinate with the local power supplier to provide the power service connection at least 2 weeks prior to request for service connection. Coordinate the location and number of sources of power with any public partner maintenance agreements. Place location of sources of power to allow for the appropriate electrical billing of each public Utility. Contact the electric Utility to determine the source of power.

Install the electrical service conforming to local utility requirements. Furnish the utility with a wiring affidavit, certifying that the service was installed conforming to the WSEC.

16.4.3 Materials/Testing Requirements

Use products from the WisDOT QPL, unless otherwise specified in this section.

16.4.3.1 Temporary Traffic Signal Material Requirements

16.4.3.2 Temporary Lighting Material Requirements

16.4.3.3 Permanent Signing Material Requirements

Use materials that conform to the requirements of Standard Specifications sections 634-638.

16.4.3.4 Permanent Pavement Marking Material Requirements

Use materials that conform to the requirements of Standard Specifications section 646.

16.4.3.5 Permanent Traffic Signal Material Requirements

16.4.3.6 Permanent Lighting Material Requirements

16.4.3.7 Instrumentation/Monitoring Plans

16.5 Deliverables

Table 16-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Contractor’s responsibility to determine and submit all Deliverables, as required by the Contract.

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Table 16-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Preliminary Signing Plan	Approval	16.3.4.1
Temporary Signal Plan	Acceptance	16.3.4.1
Temporary Lighting Plan	Acceptance	16.3.4.2
Permanent Signing Plan	Approval	16.3.4.3
Permanent Pavement Marking Plan	Approval	16.3.4.4
Permanent Traffic Signal Plan	Approval	16.3.4.5
Permanent Lighting Plan	Approval	16.3.4.6
Photometric Analysis	Acceptance	16.3.2.2
SignCAD Files	Acceptance	16.3.4.7
Temporary Signal Timing Plans	Acceptance	16.4.2.1

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EXHIBITS

All exhibits are provided as electronic files.

Exhibit 16-A Traffic Signal Design Detail Form

Exhibit 16-B Permanent Lighting Location Information

Lighting system location(s)

Include preliminary permit(s)

Lighting equipment

Exhibit 16-C Existing Signing Inventory

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17 Intelligent Transportation Systems

17.1 General

Section 17 describes the requirements associated with the development of ITS for the Project.

17.2 Administrative Requirements

17.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to ITS, follow the order of precedence set forth below, unless otherwise specified:

- WisDOT *Traffic Engineering, Operations, and Safety Manual (TEOpS)*
- WisDOT Statewide ITS Architecture
- *Wisconsin Manual on Uniform Traffic Control Devices (WMUTCD)*
- PM: Review status of Special Provisions. See Book 3, Section 5 for how Special Provisions are to be modified. Modify Special Provision requirements in the appropriate location in this section by adding pertinent requirements, OR modify the specific Special Provision text in the Book 3, Section 5, Modifications to Special Provisions document.
- WisDOT *Facilities Development Manual*
- National Fire Protection Agency
- National Electric Code (NEC) Standards, including Lighting Requirements
- International Code Council International Building Code (IBC)
- AASHTO *A Policy on Geometric Design of Highways and Streets*
- AASHTO *Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals*
- AASHTO *Roadside Design Guide*
- U.S. Department of Transportation National ITS Architecture
- National Electrical Manufacturers Association (NEMA) Standards
- Electronics Industries Alliance (EIA) Standards
- Telecommunications Industries Association (TIA) Standards
- National Transportation Communications for ITS Protocol (NTCIP) Standards
- Institute of Transportation Engineers (ITE) Standards
- EIA/TIA Fiber Optic Test Procedure (FOTP) Standards

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- United States Department of Agriculture (USDA) Rural Utilities Service (RUS) Specifications
- Remaining standards set forth in Book 3

17.2.2 Meetings

Work with the Department to form an ITS design team to oversee and provide input on the ITS design and construction. Include permanent signing and roadway designers on the team.

The ITS design team will meet, at a minimum, as described below in this section.

17.2.2.1 ITS Design Workshop

Schedule an ITS design workshop prior to initiation of design plans or any Work that disrupts existing ITS infrastructure and field equipment. Include the Department's PM and ITS staff in the ITS design workshop. Coordinate with the Department to determine if additional stakeholders such as FHWA, affected cities and counties, or others should be invited to participate in the workshop. The ITS design workshop is intended to build consensus on the goals, parameters, and overall functionality and feasibility of the system. Provide hardcopy layouts of the draft ITS Conceptual Plan at the ITS Design Workshop.

At the ITS design workshop, discuss the following topic areas:

- Salvaged, installed, or removed ITS infrastructure
- CCTV surveillance at signals system
- Fiber-optic cable/conduit location
- Blown-in fiber (practices and procedure)
- Vault locations
- Connection to in-place ITS infrastructure
- Cabinet and communication hut locations
- Fiber-optic cable splicing, terminating, and testing
- Locating ITS components (DMS, cameras, ramp control signals, detection, others, as necessary).
- Sources of power for ITS equipment and coordination with local utility provider
- State-furnished material lead time
- Automatic Traffic Recorder (ATR)
- Road Weather Information Systems (RWIS)
- Worker certifications
- Component testing

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- Test equipment calibration
- ITS construction best practices
- Documentation, GPS coordinates, as-built, and submittal requirements
- Temporary ITS infrastructure, including Contractor's plan for construction staging specific to the ITS infrastructure, the plan for maintaining communication to devices, and the length of downtime for unavailable devices

17.2.2.2 ITS Progress Meetings

During the ITS design development and ITS construction, organize, schedule, and conduct every-other-week design progress meetings to be attended in person with the ITS design team and affected cities and counties to discuss progress of the ITS design and ITS construction until As-Built Documents have been submitted, unless the Department allows a lesser frequency. Take meeting minutes and distribute them within 1 working day via email to the ITS design team, meeting attendees, and the Department.

At the meeting, provide location maps for review and inspection that show all proposed locations for ITS components and how those components interrelate to form the ITS component system. Schedule, organize, and conduct the ITS design progress meetings to accomplish the following:

- Review existing ITS systems and operations, including field verification of all legacy ITS systems and components.
- Define and finalize the functional, technical, operational, and maintenance ITS design.
- Finalize the goals and parameters of the ITS design.
- Address State-Furnished Equipment needs and timelines.
- Discuss integration requirements.
- Work toward the acceptance of the ITS design.
- Address and discuss ITS construction issues.
- Monitor SOP coordination status.

17.2.2.3 GPS As-Built Data Meeting

Prior to any GPS As-Built data collection, schedule and hold a meeting with the Department to discuss the proposed process and final deliverables. Ensure data collection personnel attend the meeting. Provide the Department at least 2 Working Days' notice of the meeting.

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17.2.3 Equipment/Software

17.2.3.1 State-Furnished Materials

The following materials will be State-furnished in compliance with Division SZ of the Special Provisions:

- Camera assemblies
- Camera poles with lowering assemblies
- Dynamic message signs (DMS)
- ITS ground-mount field cabinets
- ITS pole-mounted cabinets
- Microwave detector assemblies
- Solar power systems
- Ethernet switches and optics
- Wireless radios and antennas
- Cellular modems and antennas
- Terminal servers
- 2070 controllers for ramp metering
- Fiber-optic cable
- Fiber-optic splice enclosures
- Fiber-optic termination panels

17.2.4 Salvaged Materials

Salvage the following materials in accordance with Exhibit 17-B and Division SZ of the Special Provisions:

- Camera assemblies
- Camera poles with lowering assemblies
- Dynamic message signs (DMS)
- ITS ground-mount field cabinets
- ITS pole-mounted cabinets
- Microwave detector assemblies
- Solar power systems
- Ethernet switches and optics

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- Wireless radios and antennas
- Cellular modems and antennas
- Terminal servers

17.2.5 Permits/Authorizations

17.3 Design Requirements

17.3.1 General Requirements

Design, furnish, and install a complete, operational, and maintainable ITS system, including all components unless stated otherwise in this section. Remove, salvage, furnish, and install the ITS components shown in Exhibit 17-B (ITS Layout). Remove, salvage, furnish, and install all ancillary ITS Materials, infrastructure, and components necessary to accomplish the Work shown in Exhibit 17-B, and integrate with any existing systems. ITS components include all items furnished, installed, or furnished and installed by the Contractor and all existing ITS infrastructure.

Design the ITS components to be placed in a location that generally conforms to the locations shown in Exhibit 17-B while allowing the flexibility to move the ITS components to meet the specific requirements of Book 3 and other Contract requirements. Department Approval is required if the ITS components are moved more than 25 feet from the locations shown in Exhibit 17-B. Ensure these systems and components are compatible with the in-place legacy system and any future system planned by the Department.

Protect non-breakaway ITS infrastructure within the clear zone with roadway barrier or other allowed installations. ITS equipment may be placed outside of the clear zone without roadway barrier as long as it functions properly and is located in a dry area. Provide a maintenance access in the roadway barrier within 50 feet of the equipment between the shoulder and the equipment. If there is not a full shoulder, provide a 60-foot by 12-foot gravel pad for truck parking by ITS equipment. Provide a dry path from the maintenance access to the equipment. A dry turf path is acceptable.

Provide an ITS design that includes the following devices and equipment:

- [list item(s) and provide a general location of where they should be placed]

Label the ITS devices with Department -provided naming and numbering convention.

17.3.1.1 Has Met and Approved/Qualified Products List

The term “Has Met” refers to a manufacturer’s product that is in conformance with the applicable specifications. Submit any other manufacturer’s product of equal or better quality to the Department for Approval.

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The term QPL refers to the WisDOT Qualified Product List. These products are in conformance with the applicable specifications. Submit other manufacturer's products of equal quality by following the approval/qualification guidance for a given product category. See the QPL web page: https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/tools/prods/qpl.aspx.

17.3.2 Investigations/Supplemental Work

17.3.3 Design Criteria

17.3.3.1 Communication Network

Perform the following:

- Maintain the existing communications functionality during construction, including unused fiber capacity.
- Design and construct a communications network to serve the ITS components along the segments of the Project.
- Provide communication links with proposed ITS components to in-place components that are not located within the R/W or within the Project limits.

Do not use wireless communications for the ITS communications network, unless approved by The Department.

Do not substitute, apply, or attach any part or piece of equipment contrary to the manufacturer's recommendations.

17.3.3.1.1 Fiber-Optic Cable

Perform the following:

- Locate fiber-optic trunk cable that runs parallel with overhead electrical transmission lines as far from the transmission lines as possible to minimize induced voltage onto the fiber-optic armored jacket. Ensure proper grounding of the cable.
- Install Department-furnished fiber-optic cable in the general locations shown in Exhibit 17-B.
- Minimize the number of transverse crossings of the freeway.
- Place all permanent fiber-optic cables within conduit.
- Install fiber-optic cables between splice vaults/shelter and field device control cabinets.
- Install a minimum size fiber-optic trunk cable of 72 SM.
- Install drop fiber cables to control cabinets and terminate the fiber-optic cable with the specified connectors.

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Install State-furnished fiber termination equipment (i.e., fiber termination panels and fiber splice enclosures) to accommodate the increased number of fibers in the trunk fiber-optic cable line. Reroute fiber-optic cable for devices outside the Project limits that are routed through the Project limits. See QPL web page and Special Provisions for product lists.

17.3.3.1.2 Closed-Circuit Television (CCTV) Assembly

Install Department-furnished camera poles and lowering systems, pole-mounted control cabinets, and camera assemblies at the locations indicated on Exhibit 17-B. Furnish and install all other required CCTV hardware, including cabling and lightning and surge protection. Consult with the Department on the areas of concern, such as camera views, accessibility, and maintainability, and for placement of CCTV cameras. CCTV systems within the Project limits must remain operational during construction. Provide a CCTV system that includes the following maintenance-free components:

- Coverage to remotely monitor highway or connecting arterial street traffic conditions, and if possible, confirm messages displayed on any remotely controlled DMS
- Placement to allow monitoring of ramp metering and ramp queues, if applicable

Do not place standards and cameras in the median of the highway.

17.3.3.2 Ramp Meter Systems

Install ramp meter systems at the locations indicated in Exhibit 17-B. The Department will furnish 2070 ramp meter system controllers and ground-mount cabinets to be installed by the Contractor. Furnish and install all other ramp meter system equipment. Provide a fully functional ramp meter system that matches the ramp meter configuration in Exhibit 17-B using components from the QPL.

17.3.3.3 System Detection Stations

Install Systems Detector Stations (SDS) at the locations in Exhibit 17-B. The Department will furnish microwave detectors and solar power systems to be installed by the Contractor. Furnish and install all other SDS equipment. Provide a fully functional SDS using components from the QPL. Install the SDS on a stand-alone pole, unless approved by The Department.

17.3.3.4 Dynamic Message Signs

The Department will furnish the DMS for installation by the Contractor. Install a paved parking pad for maintenance activities. See Section 11 (Roadways) for additional details. Furnish and install the DMS support structure. See Section 16 (Traffic) for additional details.

Design the DMS support structure using a Structural Engineer licensed in the State of Wisconsin. Provide a walkway on all overhead DMS structures that extends over the roadway to the outside edge of the shoulder or to the edge of the structure, as Approved by the Department. Provide all mounting hardware and mount the DMS to the support structure. Locate the signs to allow motorists to select alternate routes and to advise travelers of adverse

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road conditions, including construction-related congestion. The Department personnel at the Traffic Management Center will change the messages on the signs.

Place DMS signs in the approximate locations indicated in Exhibit 17-B unless otherwise approved by the Department. Place DMS signs in coordination with the permanent signing plans. DMS signs can be moved longitudinally within 50 feet of the location identified in Exhibit 17-B without the need for additional geotechnical information for foundation design to be obtained and paid for by the Contractor. Locate the DMS so no lane closures are required to perform maintenance.

Install a paved parking pad and roadside hazard protection for maintenance vehicle access at all DMS locations in compliance with Section 11 (Roadways). Size the paved parking pad to accommodate an aerial lift truck and a standard pick-up truck with both vehicles located simultaneously on the paved parking pad.

17.3.3.5 ITS Communication Hut

17.3.3.5.1 Electrical Conduit

Provide galvanized steel or corrosion-resistant metal conduit raceways, fittings, and hardware for aboveground installations.

17.3.3.5.2 Electrical Wiring

Provide copper wire only.

17.3.3.5.3 Lighting

Provide minimum illumination at floor level of 150 footcandles.

17.3.3.5.4 Duplex Receptacles

Provide receptacles of 20 amps and 110 volts.

17.3.3.5.5 Cable Tray

17.3.3.5.6 Control Cabinets

Control cabinets will be furnished by the Department.

17.3.3.6 Communication Vault and Pull Box

17.3.3.6.1 Communication Vault

Provide a communication vault from the Qualified Products List.

Place communication vaults in locations to minimize the number and length of pigtails. However, use the location of field devices as the controlling factor in vault placement. Place vaults so the spacing between them is no more than 2,000 feet. Place vaults in a location compatible to furnishing and installing the drain system and daylighting drainage. Cable runs must connect equipment vaults without any splices between those equipment vaults.

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17.3.3.6.2 Pull Box

Provide a pull box from the Qualified Products List. Modify proposed pull boxes to accommodate existing conduit as needed. Pull boxes serve as collection points for conduits entering a cabinet, shelter, or service. Perform the following:

- Place pull boxes adjacent to all control cabinets, shelters, electrical service points, and detector stations.
- On long conduit runs designed to contain pulled-in cables, place pull boxes no farther apart than 300 feet.
- Do not place pull boxes in the median of the freeway.
- For pull boxes placed in unpaved areas and not subject to vehicular loading, install the pull vaults so covers and frames are level with the final grade.
- Do not place pull boxes where they may be subjected to vehicular loading.

17.3.3.7 NMC and HDPE Conduit

Provide conduit systems for power and communication systems using conduit types specified in sections 652 and 671 of the WisDOT Standard Specifications. Do not use buried rigid steel conduit (RSC) except under rail crossings as negotiated with railroad companies, and under or within bridges. Do not use intermixed conduit sizes within conduit runs. Furnish and install Fiber-Optic Cable Markers as specified in section 671 of the WisDOT Standard Specifications.

17.3.3.7.1 Existing Conduit Systems

Existing conduit systems may consist of stick polyvinyl chloride, stick polyethylene, continuous polyethylene, or RSC.

17.3.3.8 Electrical Service

Do not share electrical service for ITS components with other roadway components unless approved by the Department.

17.3.3.8.1 Coordination with Power Utility

Perform the following:

- Process an application for electrical service for each location.
- Coordinate with the Utility to ensure the proper location of electrical services provided by the Utility.
- Provide the Utility company with the construction schedule so that power is available when needed.

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17.3.3.9 Automatic Traffic Recorder (ATR)

17.3.3.10 Roadway Weather Information Systems (RWIS)

17.3.4 Reports and Plans

17.3.4.1 ITS Conceptual Plan

Provide an electronic copy of an ITS Conceptual Plan to the Department for acceptance a minimum of 2 weeks prior to submitting any ITS RFC documents. At a minimum, denote the location of ITS components, construction, and testing schematics in this plan.

17.3.4.2 Maintenance and Operations Manual

Supply, as part of the Work, all manufacturers' maintenance and operations manuals in a complete package unless waived by the Department in writing. A complete package is defined as one assembled submittal of all manuals with a table of contents for all equipment installed as part of the Project. Submit electronic copies, with original hard copies if available, for acceptance.

17.3.4.3 Project Testing and Documentation

Present Project testing and documentation submittals in accordance with the applicable sections of the WisDOT Standard Specifications. Transmit submittals directly to the Department as a complete package unless allowed in writing by the Department. A complete package is defined as one assembled submittal for components and one assembled submittal for testing, which includes all required documentation. Project testing and documentation submittals are required for the following items:

- ITS components
- Fiber-optic cable
- Fiber-optic test plan
- Submit an electronic copy of the Fiber-Optic System Test Plan to the Department for approval. The Department will respond within 10 Working Days of receipt of the Fiber-Optic System Test Plan.

Use the Fiber-Optic Schematic sheets in Exhibit 17-C as a guide for developing fiber-optic schematics to record power meter and Optical Time Domain Reflectometer test data, as well as the physical characteristics of the fiber-optic cable and fiber-optic cable run.

17.4 Construction Requirements

Design the ITS system as a whole before installing any individual field component unless otherwise Approved by the Department. Notify the Department 3 Working Days in advance of staking locations for ITS components. Do not make final connections of the newly installed components to the existing system without the Department's approval.

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17.4.1 General Requirements

- Provide the Department a 4-month advance notice of installation of camera assemblies, microwave detectors, solar power systems, ethernet switches and optics, wireless radios and antennas, cellular modems and antennas, terminal servers, 2070 controllers, fiber-optic enclosures, and fiber-optic termination panels. This lead-time is necessary to order communications end equipment.
- Provide the Department a 6-month advance notice of installation of camera poles with lowering assemblies, DMS, pole-mounted cabinet, and ground-mounted cabinets.
- Provide the Department a 9-month advance notice of installation of fiber-optic cable and communication huts.
- Complete the ITS Work, described in Section 17.2.3, 60 Days in advance of the Substantial Completion date to allow the Department to complete ITS integration by the Substantial Completion date. The 60-Day TMS integration period must be between April 15 and December 1.
- Notify the Department ITS Integrator 90 Days prior to completion of the ITS Work.

17.4.1.1 Allowable Working Hours on the ITS System

Do not affect ITS devices outside the Project limits; all must remain operable during construction of the Project. Ensure the Traffic Management System is fully operational Monday through Friday from 5:00 a.m. to 9:00 a.m. and 3:00 p.m. to 7:00 p.m. unless otherwise approved by the Department. Notify the Department 2 Days prior to performing any Work on existing/active system elements. Perform all Work in a manner ensuring the integrity and proper performance of all ITS components during these hours.

17.4.1.2 Maintenance/Operation of ITS Components

Maintain and operate temporary ITS installations and permanent ITS installations not yet accepted by the Department as complete. Maintenance and operation includes the Contractor's response to faults. There are three categories of faults: urgent, priority, and minor, as follows:

- **Urgent**—Any fault that causes a total failure, disruption, or system-wide disruption of the following equipment or services:
  - Communications links and equipment
  - CCTV

Respond to urgent faults of ITS components in less than 4 hours. Repair urgent faults of ITS components in less than 4 hours after the response.

- **Priority**—Any fault that causes a failure or disruption of an operator workstation, local control unit for DMS, or the DMS itself. Respond by noon the next day. Make repairs in less than 4 hours.

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- **Minor**—Any other fault. Respond by midnight of the next day. Make repairs in less than 4 hours.

Replace (do not repair) ITS infrastructure if any of the following occur:

- The Contractor has attempted to repair ITS infrastructure on at least one previous occasion and there has been a subsequent failure.
- The repair activities interfere with the movement of traffic, or the Department determines that replacement is necessary in the interest of public safety.

17.4.1.3 Intelligent Transportation System Integration

Coordinate all integration activities per the Department specifications and the following:

- Acquire approval from the Department when the following ITS component locations are staked or flagged:
  - [list item(s)]

Locate all existing utilities prior to installation of any proposed Department -staked ITS infrastructure locations. Any staking performed by the Department is not a substitute for existing utility location.

17.4.1.4 Electrical Service

Unless otherwise specified, coordinate with power company to provide 120v/240v electrical power to each location as necessary. Step-down transformers are not allowed as part of the electrical system maintained by the Department. Apply for electrical service and incur costs associated with Utility hook-up charges and components installed by the power company. Ensure service components are composed of non-ferrous or stainless-steel Materials, with the exception of the meter socket.

17.4.2 Construction Criteria

17.4.2.1 ITS Communication Hut Foundation

Furnish and install the ITS Communication Hut Foundation per the ITS Communication Hut Manufacturer’s specifications, or as designed by the Contractor and Accepted by the Department.

17.4.2.2 Fiber-Optic Cable Splicing

Splice to new or existing fiber-optic cables at the location determined in Exhibit 17-B (ITS Layout).

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17.4.3 Materials/Testing Requirements

17.4.3.1 Communication Network

Configure locations containing identical equipment and wire in a consistent, if not identical manner, including internal wiring and harnesses, wiring color codes, labeling terminal block positions, termination strips, power service configuration, and panel and equipment mounting and locations.

Submit fiber-optic cable testing documentation submittals to the Department 30 Working Days after the last test.

17.4.3.2 Documentation

Notify the Department when all ITS requirements have been met. The Department will Accept the Contract Work after verifying proper operation of all ITS devices. Provide the following during construction as described below:

- Submit inspection checklists, attached as Exhibit 17-A, with all forms signed by Contractor's Traffic Engineer.
- Submit the proof of performance (POP) test results to the Department for acceptance.
- Submit for approval detailed pre-installation test (PIT) procedures in accordance with standard testing procedures at least 2 weeks before the commencement of the test.
- Submit PIT results to the Department for approval at least 2 weeks prior to the scheduled installation of the equipment.
- Submit the loop detector test report to the Department within 7 Days after splicing the lead-in cable for all loops.
- Submit all wiring diagrams, incorporating all comments, to the Department for review.
- Submit electric, electronic, power, and control cable test results to the Department within 1 week of making final connections.

17.4.3.3 Monetary Deductions

The Department will assess the Contractor $200 per day for each day or portion thereof that the Department determines the Contractor has not complied with fiber-optic cable testing documentation described in this section.

17.4.4 Deliverables

Table 17-3, which lists Deliverables identified in this section, is not intended to be exhaustive. It is Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

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Table 17-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
ITS Conceptual Plan	Acceptance	17.3.4.1
Maintenance and Operations Manual	Acceptance	17.3.4.2
Fiber-optic system test plan	Approval	17.3.4.3
Documentation submittals	Acceptance	17.4.3.2

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EXHIBITS

Exhibits are provided as electronic files.

Exhibit 17-A Intelligent Transportation Systems Testing and Checklist Forms

- WisDOT Fiber-Optic Vault Inspection Checklist
- WisDOT CCTV Pole Box Inspection Checklist
- WisDOT CCTV Pole Inspection Checklist
- WisDOT DMS Inspection Checklist
- WisDOT Loop Detector Test Report
- WisDOT NID Pole Inspection Checklist
- WisDOT Preformed Loop Detection Inspection Checklist
- WisDOT Ramp Meter Inspection Checklist
- WisDOT Saw-cut Loop Detection Inspection Checklist

Exhibit 17-B WisDOT ITS Layout

Exhibit 17-C

- ITS Detail Sheets
- WisDOT ITS Details
- Example Fiber-Optic Schematics

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18 Traffic Control

18.1 General

Section 18 describes requirements associated with traffic control, including providing for the safe and efficient movement of people, goods, and services through and around the Project while minimizing negative impacts to residents, commuters, and businesses. It also describes allowable road/lane closures, requirements for a Transportation Management Plan, and the duties of the Design-Builder's Traffic Control Supervisor (TCS).

18.2 Administrative Requirements

18.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to traffic control, follow the order of precedence set forth below, unless otherwise specified:

1. WisDOT Standard Detail Drawings
2. Wisconsin Flagging Handbook
3. WisDOT Sign Plates
4. *Wisconsin Manual on Uniform Traffic Control Devices* (*WMUTCD*)
5. WisDOT *Traffic Engineering, Operations and Safety Manual (TEOpS)*
6. WisDOT Facilities Development *Manual (FDM)*
7. Remaining standards set forth in Book 3
8. WisDOT CADDS Sign Design Guidelines Manual

18.2.2 Meeting Requirements

Conduct a preliminary staging meeting to discuss goals, preliminary concepts, and associated timelines within 30 Days of Notice to Proceed 1 (NTP1). Attendees must include the Design Manager, Construction Manager, Design-Builder's Traffic Control Supervisor, the Department Construction PM, and the Department Region work zone engineer.

Separately, establish a traffic control task force, inviting representatives of the Design-Builder (including the PI liaison), the Department, Cities, Counties, law enforcement agencies, emergency response providers, and other agencies whose operations affect or are affected by the Project construction or traffic control.

Hold traffic control task force meetings bimonthly from NTP1 to Project completion. The meeting schedule and frequency may be adjusted upon the agreement of the traffic control task force members. Meet the following objectives for these meetings:

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- Further refine and develop the traffic control Plans.
- Review the Design-Builder's traffic control details.
- Disseminate Project traffic control information to task force meeting attendees.
- Obtain traffic control input from task force meeting attendees.
- Develop, refine, and review the Incident Management Plan (IMP) and its implementation.
- Review all crashes that occur within the Project limits and upstream of the Project temporary traffic control devices. Review detour route and any crashes that occur on the detour route.

Submit a list of all parties invited to join the traffic control task force, including their responses to the invitation.

18.2.3 Equipment Requirements

18.2.4 Software Requirements

1. The Design-Builder may request sign plates per FDM 11-50-55. DOTBTOSignDetails@dot.wi.gov
2. If the Design-Builder is to design sign plates, use SignCAD for the design of special signs on the Project. BTO will have a minimum of 3 weeks to review prior to Design-Builder ordering special signs.

Access to WisDOT TMP System: https://transportal.cee.wisc.edu/tmp/

Access to WisDOT Lane Closure System (LCS): https://transportal.cee.wisc.edu/closures/

18.2.5 Permits/Authorizations

18.3 Design Requirements

18.3.1 General

18.3.2 Investigations/Supplemental Work

The Design-Builder's TCS must review the location of all traffic crashes within the Project limits and upstream of the Project in person to determine whether modification to maintaining the traffic scheme is necessary. Provide a report detailing each incident, including the traffic control setup at the time of the incident, time of occurrence, weather, pavement condition, and recommendations for modifications to the setup, if necessary, within 48 hours of occurrence. Send the report to DOTworkzonecrashes@dot.wi.gov.

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18.3.3 Design Criteria

18.3.3.1 Design Vehicle

Ensure traffic control accommodates a WB-62 design vehicle unless otherwise specified or Approved by the Department.

18.3.3.2 Temporary Guardrail, Barrier, Attenuators, and Glare Screen

Use temporary guardrail or barrier and attenuators to protect the traveling public from the following:

- Fixed objects within the clear zone
- Drop-offs that are not in accordance with the traffic control treatment of longitudinal joint and edge drop-off guidelines in the WisDOT *FDM, Section 11-50-21.6.*
- Slopes steeper than 1:3 (V:H)

To reduce the headlight glare of approaching vehicles, place a temporary glare screen on top of the temporary precast barrier wall that separates opposing traffic at curves or lane shifts where opposing traffic headlights will impact oncoming traffic. Glare screen installation must be MASH compliant.

18.3.3.3 Pedestrian Access

Maintain existing pedestrian access on all existing sidewalks, paths, and intersections unless Approved by the Department or otherwise noted.

The Design-Builder must demonstrate pedestrian access cannot be maintained before a detour will be considered by the Department. If the Department agrees that access cannot be maintained, obtain approval from the Department and all other appropriate governing agencies to close or modify the pedestrian access. If an access closure is granted, provide a plan of the signed detour route for pedestrian access for approval.

The alignment of the existing sidewalk or path can be temporarily relocated within the Department's R/W to avoid pedestrian conflicts with the Work area. Provide a safety buffer between the temporary sidewalk or path location and the Work area. The temporary shift in the alignment of the sidewalk or path would not be considered a detour, and would not require signing or approval by The Department.

Coordinate with business owners within the Project limits and The Department's Business Liaison for temporary and permanent pedestrian access to their businesses. Maintain pedestrian access to all businesses within the Project limits at all times.

18.3.3.4 General Project Requirements

Submit temporary pavement designs to the Department. See Section 10 (Pavements and Roadway Materials) for temporary pavement design details and requirements.

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18.3.3.5 Road-Specific Requirements

18.3.3.5.1 Interstate, US Highways, State Highways-[###][Route]:

- [# of lanes][# of lanes][direction of travel] through lanes and [# of lanes] [direction of travel] through lanes
- Ramps (requirements for direct system-to-system movement requirements with no yield conditions):
  - [# of lanes] [direction of travel] [Route] through lanes and [# of lanes][# of lanes] left turn lane in [direction of travel] direction
  - [# of lanes][direction of travel] [Route] to [# of lanes][direction of travel][Route]
- Ramps (requirements for service movements with intersection control conditions):
  - [# of lanes][# of lanes] through lanes and [# of lanes][# of lanes] left-turn lane in [direction of travel][direction of travel] direction
  - [# of lanes] [# of lanes] through lanes and [# of lanes][# of lanes] right-turn lane in [direction of travel][direction of travel]direction.

18.3.3.5.2 County Highways and Local Roadways

- [# of lanes][# of lanes]through lanes and [# of lanes][# of lanes] left-turn lane in [direction of travel][direction of travel] direction
- [# of lanes][# of lanes]through lanes and [# of lanes] [# of lanes] right-turn lane in [direction of travel][direction of travel] direction.

18.3.3.6 Lane Rental Fee Assessment

The Design-Builder will be assessed Lane Rental charges in accordance with Table 18-1: Permitted Temporary Lane Closures
and Lane Rental Fee Assessment

Lane Rental charges a fee to the Design-Builder for exceeding maximum allowable closure times. A Lane Rental is charged for a closure of any portion of roadway closed for any part of a 15-minute increment exceeding the allowable lane closure restrictions.

Table 18-1: Permitted Temporary Lane Closures and Lane Rental Fee Assessment

Roadway	Closure Type	Day of Week	Permitted Closure Hours	Fee Assessment (Per 15-Minute)
I-		[day of week] –[day of week]	[12:00 AM] to [00:00] [AM/PM] [00:00] [AM/PM] to [00:00] [AM/PM]	$[dollars]

Notes:

1. Lane rental fee assessments will be charged in 15-minute increments.

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2. Failure to remove closure types within the permitted closure hours will result in additional lane rental fee assessments for each 15-minute increment outside the permitted closure hours that the Department determines the Design-Builder has not complied.

18.3.3.7 Completion of Work

Complete all Work for each roadway within the completion date indicated in Table 18-2.

Table 18-2: Completion Date and Liquidated Damages

Roadway	Stage/Location	Completion Date	Liquidated Damage (Per calendar day)
[road name/###]	([road name/###][Intersection] or [Intersection approach]	[##][Date]	[##] $[dollars]
[road name/###]	[Stage]	[##]	
[road name/###]	[STA] to [###+##][STA] [###+##]	[##]	

Notes:

1. Complete date may indicate an interim or final completion of Work.

18.3.3.7.1 Work Restrictions

Do not perform Work on, haul materials of any kind along or across any portion of the highway carrying 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 and special events: Section 9 of TMP.

18.3.3.8 Intersection Control

Provide intersection control as needed in accordance with TEOps 6-1. Ensure that intersection control operates within 10 seconds of delay for each intersection approach movement of the intersection control being replaced.

18.3.4 Reports and Plans

18.3.4.1 Transportation Management Plan

- Describe contact methods, personnel available, and response times to address any conditions needing attention during off-hours.
- Accommodate special events per coordination with local stakeholders.
- Identify measurable limits for repair and replacement of traffic control devices, including pavement markings. Refer to Book 3 for applicable guidelines.
- Identify, produce, and receive acceptance for designs of any necessary temporary traffic signals or intersection control changes.
- Determine anticipated and actual impacts due to traffic diversion using traffic modeling and observation during construction. Traffic impacts from diversion to parallel routes may require the development, acceptance, implementation, and maintenance of mitigation methods used to address parallel route impacts.

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- Determine the need for revised traffic signal timings. If revisions are required, detail the procedures for the development, acceptance, implementation, testing, and maintenance of all affected signals. See Section 16 (Signing, Pavement Marking, Traffic Signals, and Lighting).
- Provide an Incident Management Plan (IMP) as described in Section 18.3.4.2, including the process to receive approval of stakeholders of the IMP.
- Maintain existing access to all properties within the Project limits for the duration of the Project, except as provided elsewhere in the Contract Documents. Provide appropriate information about access modifications to the appropriate parties.
- Provide continuous access to established truck routes and hazardous materials (HazMat) routes. Determine if Project is on Oversize Overweight Truck Route, National Long Truck Route, High Clearance Route, or Wind Tower Corridor.
- Modify the Traffic Control Plans as needed to adapt to current Project circumstances.
- Update the TMP for any changes to the traffic control. Changes to the traffic control should comply with the TMP or engineering analysis should support change. Use the Amendment process in the WisTMP System.
- Communicate TMP information to the Design-Builder's public information personnel and notify the public of Traffic Control issues in conjunction with the requirements of Section 3 (Public Information).
- Implement environmental commitments (if any) related to traffic operations during construction.

Use the procedures developed in the TMP to create the Traffic Control Plans, including details of all stages and phases, all required switching procedures, and the IMP.

Obtain approval of the TMP prior to issuance of NTP2. The Department will respond to the submittal within 15 Working Days. Update the TMP throughout the Project and revise as conditions or situations may arise that will change the Project staging.

18.3.4.2 Incident Management Plan

During construction, equipment malfunctions, crashes, inclement weather, special events, and other incidents can significantly affect traffic within the Project limits. Prepare and implement an IMP for all types of potential incidents. Identify methods for incident detection and verification, response, Work zone access and management, clearance, and collection of motorist information. If any local agencies along the corridor have adopted incident management guidelines, coordinate with local policies and procedures.

Include proposed construction phasing in the IMP. Modify and implement the IMP in conjunction with planned special events. Provide a mechanism in the IMP to review and capture lessons learned from all incidents. Include specific time limits for the detection, verification, and classification of incidents, as well as for the dissemination of information about the incidents.

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Identify and provide for the incorporation of design elements to aid incident management, including turnarounds for emergency vehicles, emergency access points, crash investigation sites, and signing such as enhanced reference markers to help motorists report the location of crashes or incidents in the Project.

18.3.4.3 Traffic Control Plans

Prepare and submit Traffic Control Plans and Plan revisions in compliance with Exhibit 18-A (Traffic Control Plan Requirements), signed by the Traffic Engineer. The Department will respond to the Traffic Control Plan submittals within 14 Working Days. Distribute the Accepted Traffic Control Plans to stakeholders at least 14 Working Days prior to implementation, or as directed by the Department.

18.4 Construction Requirements

18.4.1 General

Provide traffic control devices, markings, and signing starting on the day Work begins on the Project. Continually monitor and maintain the traffic control devices to ensure proper placement and the safe and efficient flow of all construction traffic into and out of the Project. Perform Work necessary to implement traffic control plan and perform maintenance until Substantial Completion at a minimum. Punch List Work items required for the Design-Builder to receive Final acceptance, or warranty Work items that necessitate traffic control will require traffic control as determined by the Department. Maintain and monitor traffic control related to punchlist items, items required for the Design-Builder to receive final acceptance, or warranty Work during all times that these items impact traffic. The Department may, in writing, temporarily suspend such responsibility in conjunction with an official suspension for weather or other reasons.

18.4.1.1 Traffic Control Supervisor

The TCS will manage and monitor all traffic control operations for the duration of the Project.

Provide a copy of the traffic control supervisor’s certification to the Department.

The duties set forth below in this section are all responsibilities of the TCS.

Perform drive-through inspections each working day and immediately after any change in traffic control setup. If the Project has intersections, perform the review at peak traffic times, and if signalized, review each signal cycle. Perform at least two of the daily traffic control inspections each week at night so the arrangement and condition of the traffic control devices can be reviewed for the effectiveness of the retroreflective sheeting and lighting. Also include in the inspection assurances that all requirements of this section are being met.

The Department will inform the Design-Builder’s Traffic Control Engineer whenever the design is not functioning as intended or when improvements are warranted. Document the results of the inspection in a daily report that, at a minimum, lists the exact timeframe of the drive-through

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inspection and the defects noted. Document any maintenance or corrective action ordered as a result of the inspection and the name and position of the Design-Builder personnel directed to provide the maintenance or corrective action in the report. Sign the daily report and note whether the traffic control setup and all traffic control devices are in substantial conformance with the Contract requirements.

18.4.1.2 Staging Areas

Staging areas are sites where equipment or vehicles needed for incident clearance can be stored and have reasonable and safe access to the construction zone. Ensure, at a minimum, that the staging areas meet the following requirements:

- Provide reasonable and safe ingress and egress to/from the Work zones.
- Ensure that Design-Builder's Project-related staging locations outside the Department's R/W are in accordance with local ordinances.

18.4.1.3 Temporary Vertical Clearances

Vertical clearances for bridges over roadways may be temporarily decreased during construction to a minimum of [XX.XX] feet [X.XX feet, as low as 15 feet]. If an existing bridge has an existing vertical clearance of less than [XX.XX] feet[X.XX feet], the vertical clearance may remain as is, but may not be decreased during construction. If existing vertical clearances are temporarily decreased to no less than [XX.XX] feet[X.XX feet], the Design-Builder must notify the Department's staff of the temporary clearance dimensions and the timing of the reduced clearance.

Horizontal clearances through Work zones may be temporarily decreased during construction to a minimum of [XX.XX] feet. Closures and restrictions will be entered into LCS.

18.4.2 Construction Criteria

18.4.2.1 Project-Specific Items

A minimum of 7 Days prior to beginning Work on the Project, place PCMS boards in advance of the construction area in all [##] [##] directions.

Provide the following advance notification to the Department for incorporation into the Wisconsin LCS. Obtain all traffic control permits from the appropriate roadway authority (Table 18-3). Ensure all necessary RFC Documents and Traffic Control Plans are reviewed and Approved or Accepted (as required by the Contract Documents) by the Department prior to providing notification.

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Table 18-3: Traffic Control Notifications

Closure type with height, weight, or width restrictions (available width, all lanes in one direction < 16 feet)	**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 feet)	**Minimum notification**
Lane and shoulder closures	3 Business Days
System and service ramp closures	3 Business Days
Modifying all closure types	3 Business Days

Provide certified flaggers. Construction Work zone access locations must be approved by the Department.

The Design-Builder will not restrict traffic beyond the allowances of Section 18.3.3.5.1. The Design-Builder is restricted to the hours and lane rental fee assessments in Table 18-3. The Design-Builder will not restrict traffic during Work restrictions detailed in Section 18.3.3.7.1.

Maintain access to all properties within the Project limits at all times unless otherwise arranged with the property owner.

18.4.2.2 Pedestrian Access

After obtaining approval for any pedestrian detour routes, notify the Department and all other stakeholders 7 Days prior to pedestrian access closures.

18.4.2.3 Pavement Markings During Construction

Provide temporary pavement markings per Standard Specification 646. Use epoxy pavement markings for temporary markings that will be in place from November 15 to April 15.

Do not grind or use any other method that may damage the new pavement during removal of the temporary markings.

18.4.2.4 Access

Provide temporary access to all properties if the existing access is closed. At a minimum, provide and install [material] for temporary access surfacing.

For properties being acquired by the Department as shown on Exhibit 7-A (TPP) Transportation Project Plat or Traditional Plat), maintain access to the property until the Department has acquired the property and grants the Design-Builder permission to access the property.

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Comply with mailbox requirements in Section 11 (Roadways). Ensure no property owner or resident is without a mailbox.

18.4.3 Materials/Testing Requirements

18.4.4 Instrumentation/Monitoring Plan

18.4.4.1 Video Record

Before the start of construction, video-record the entire Project Site and surrounding areas to document the pre-construction condition. Provide an electronic copy of the video to the Department prior to the commencement of construction Work.

Video-record all potential detour and haul routes prior to routing traffic on these routes.

18.4.4.2 Freeway Service Team (FST)

Contact a towing service or towing vehicle(s) immediately upon notice of all crashes, including vehicle stalls within the Project limits, during the hours of 6 a.m. to 8 p.m., Monday through Friday, and whenever the Design-Builder is performing construction.

18.4.4.3 Design-Builder Response Time

From Monday through Friday, 6:00 a.m. to 8:00 p.m., have at least one employee on call who can respond to and resolve an incident within [material] minutes. Upon arrival at the incident site, that employee must have the equipment and resources to repair barriers, set up temporary traffic control, or otherwise resolve the incident until the barrier can be repaired.

At all other times, have at least one employee on call who can respond to and resolve an incident within 1 hour.

The Design-Builder will be assessed a monetary deduction in the amount of [material]for each 15-minute increment, or any portion thereof, that the Design-Builder fails to meet the time limits specified above.

18.5 Deliverables

Table 18-4, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 18-4: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
List of task force invitees	Acceptance	18.2.2
Pedestrian Access Plan	Approval	18.3.3.3
Transportation Management Plan	Approval	18.3.4.1
Incident Management Plan	Approval	18.3.4.2

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Name	Acceptance or Approval	Section Reference
Temporary Signal Plan	Acceptance	18.3.4.3
Temporary Lighting Plan	Acceptance	18.3.4.4
Traffic Control Plans	Approval	18.3.4.5
Daily Traffic Control inspection report	Acceptance	18.4.1.1
Advance written notice of traffic closures	Approval	18.4.2.1
Signal timing Plans	Approval	18.4.2.3
Preconstruction video	Acceptance	18.4.4.1

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EXHIBITS

All exhibits are provided as electronic files.

Exhibit 18-A Traffic Control Plan Requirements (attached)

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Exhibit 18-A: Traffic Control Plan Requirements

Use the procedures in the TMP to provide for all construction staging, construction Work zone security, and access to the construction Work zone. Prepare Plans under the direction of the Traffic Engineer and submit as RFC Plans. Include the following items:

- Complete Plan sheets and details for construction staging, detours, construction access, security, and appropriate traffic control.
- Plan sheets or details for handling construction operations, such as Material delivery and storage, access and exit of construction and delivery vehicles, haul roads, and other items that may impact traffic.
- The appropriate details when temporary construction of any of the following is required to maintain traffic: traffic signals, haul routes, detour roadways, bridges, retaining structures, drainage, and other miscellaneous construction.
- Roadway Plan sheets showing all in-place traffic control devices that need to be retained, relocated, or removed and all temporary traffic control devices (including any required directional business signing) that need to be installed, retained, relocated, or removed.
- Drawings showing dimensions on how to fabricate any sign not detailed in the Traffic Engineering, Operations, and Safety Manual (TEOpS), including background color and legend.
- The size and color of all standard traffic control devices.
- Roadway Plan sheets with the exact location of each sign so it can be easily read in relation to the roadway and other traffic control devices. Do not use numbers and letters on the roadway Plan sheets as a substitute for sign placement.
- Requirements for using temporary guardrail, temporary concrete barrier, or attenuators to protect the traveling public.
- Detail modifications to the Project Traffic Control to address wintertime conditions or periods of suspended Work.
- Type and location of all signing to be installed, removed, or covered that conflicts with traffic patterns.
- Signing Plan sheets, including layouts showing the locations of ground-mounted and overhead signs, special sign details, and structural and foundation requirements.
- PCMS board locations and messages.
- Type and location of all pavement markings to be installed, removed, or renewed for each stage and location of the final pavement markings.
- Temporary pavement marking Plan sheets, including striping, crosswalks, intersection details, and traffic delineators.

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- A written switching procedure for each control stage change identified in the Traffic Control Plans. The switching procedure must consist of methods, actions, and signing necessary to complete the switch and the number and duties of traffic personnel assigned to perform the switch.

TEMPLATE

19 Maintenance During Construction

19.1 General

Section 19 describes the Design-Builder's responsibilities during construction for routine and non-routine maintenance, developing a Maintenance Management Plan, and other requirements.

19.2 Administrative Requirements

19.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to maintenance during construction, follow the order of precedence set forth below, unless otherwise specified:

- WisDOT Standard Spec 104.6
- WisDOT Highway Maintenance Manual (HMM)
- Remaining standards set forth in Book 3

19.2.2 Meeting Requirements

Prior to the start of each construction season, meet with the Department to review current Site conditions and maintenance responsibilities. The attendance of the Design-Build PM and Construction Manager is required. The Design-Builder's designated maintenance supervisor must attend weekly field construction meetings with the Department.

19.2.3 Equipment/Software

19.2.4 Permits/Authorizations

19.3 Design Requirements

19.3.1 General

Determine if maintenance activities require design. If design is required to perform the maintenance activity, perform design Work in accordance with the FDM.

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19.3.1.1 Investigations/Supplemental Work

19.3.2 Design Criteria

19.3.3 Reports and Plans

19.3.3.1 Maintenance Management Plan

Prepare a Maintenance Management Plan that includes, at a minimum, the following:

- List of all proposed routine maintenance activities
- Schedule of proposed routine maintenance activities
- Name and contact information of the Design-Builder's staff who will oversee maintenance efforts

Submit a Maintenance Management Plan as a condition of NTP2. Prepare and submit a monthly Maintenance Report to the Department detailing all maintenance activities performed.

19.4 Construction Requirements

19.4.1 General

Unless otherwise stated in this section, assume maintenance responsibilities within the Project limits at 12:01 a.m. on the first day after Contract execution. Assume this maintenance responsibility until 11:59 p.m. on the date of Substantial Completion.

The Design-Builder will maintain only those facilities or portions of facilities, including the roadbed surfaces, on which construction has begun or been completed, or has been damaged by the Design-Builder's operations, or has been damaged due to the Design-Builder's negligence or noncompliance with the requirements of the Contract.

Perform maintenance, including the following:

- Maintain temporary facilities.
- Repair shoulder drop-offs, eliminate vertical drop-offs per Standard Specification 104.6.
- Replace/repair temporary roadways, bridges, and crossovers.
- Replace/repair traffic attenuators and guardrail damaged during construction.
- Maintain the safety of the traveling public and control traffic using barricades, signs, flaggers, and temporary barrier as specified in part VI of the WMUTCD.
- Replace/repair pavements/shoulders within the Project limits under any of the following conditions:
  - The Design-Builder's construction operations damage in-place pavements/shoulders

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  - The Design-Builder's staging or routing of traffic results in pavement/shoulder damage above normal maintenance incurred under existing traffic configuration.

- Maintain drainage at and through the Worksite during construction according to Standard Specification 205.
- Maintain erosion control devices.
- Maintain haul routes.
- Maintain existing and temporary lighting.
- Maintain all parts of all signal systems.
- Maintain temporary fence.
- Keep the area free of litter and debris caused by the Project. All other litter and debris removal will follow HMM, Chapter 7, Section 1, Subject 20: https://wisconsindot.gov/Documents/doing-bus/local-gov/hwy-mnt/mntc-manual/chapter07/07-01-20.pdf
- Mow grassed areas within the Site that cannot be mowed by governmental entities due to lack of access as needed to keep the grass height at 12 inches or less. Normal maintenance will occur outside the Site as specified in the HMM, Chapter 7, Section 5, Subject 35: https://wisconsindot.gov/Documents/doing-bus/local-gov/hwy-mnt/mntc-manual/chapter07/07-05-35.pdf
- Replace/repair temporary and permanent barrier wall.
- Maintain traffic control devices supplied by the Design-Builder, including any that are displaced by snow removal operations.
- Locate any Design-Builder installed or existing Utilities within the Project limits for Diggers Hotline.

19.4.2 Materials/Testing Requirements

19.4.3 Instrumentation/Monitoring Plan

19.5 Deliverables

Table 19-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 19-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Maintenance Management Plan	Acceptance	19.3.4.1
Monthly Maintenance Report	Acceptance	19.3.4.1

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20 Bicycle and Pedestrian Facilities

20.1 General

Section 20 describes the design and construction requirements associated with bicycle and pedestrian facilities. This includes, but is not limited to, ADA compliance of facilities such as sidewalks, shared-use paths, curb ramps, and items identified in scoping and preliminary design. Coordination with other business areas will be necessary, including traffic operations for signals, pavement markings, and Work zones. As described in WisDOT's FDM, there are federal and state laws and policies regarding bicycle and pedestrian accommodations on improvement projects. FDM Section 11-46 provides detailed design and construction requirements and references to other manuals and resources as appropriate.

When pedestrian facilities are provided, they are required to be accessible. FHWA and the Department place an emphasis on curb ramps, as described in FDM Section 11-46.

20.2 Administrative Requirements

20.2.1 Standards

In the event of a conflict between the standards set forth in Book 3 relating to bicycle and pedestrian facilities, follow the order of precedence set forth below, unless otherwise specified:

20.2.1.1 Bicycle Facilities

- *WisDOT Facilities Development Manual (FDM)*
- *WisDOT Standard Detail Drawings (SDDs)*
- *Wisconsin Bicycle Facility Design Handbook*
- AASHTO *Guide for the Development of Bicycle Facilities*
- *Wisconsin Manual on Uniform Traffic Control Devices* (WMUTCD)
- Manual on Uniform Traffic Control Devices (MUTCD)
- Remaining standards set forth in Book 3

20.2.1.2 Pedestrian Facilities

- *WisDOT Facilities Development Manual (FDM)*
- *WisDOT Standard Detail Drawings (SDDs)*
- *Wisconsin Guide to Pedestrian Best Practices*
- U.S. Access Board *Public Rights-of-Way Accessibility Guidelines* (PROWAG)
- U.S. Access Board *2010 Standards for Accessible Design*

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- *Wisconsin Manual on Uniform Traffic Control Devices* (WMUTCD)
- Manual on Uniform Traffic Control Devices (MUTCD)
- AASHTO *Guide for the Planning, Design and Operation of Pedestrian Facilities*
- Remaining standards set forth in Book 3

20.2.2 Meeting Requirements

20.2.2.1 Curb Ramp Focused Design Meetings

Schedule design meetings with the Department, Contractor, and Subcontractors involved in the design of curb ramps. Curb ramp design is an area of emphasis for the Department. The design meetings will review the curb ramp design process, including the Project scope, potential curb ramp locations, technical curb ramp design details, and submittal requirements.

20.2.2.2 Bicycle and Pedestrian Design Meetings

Schedule design meetings with the Department, Contractor, and Subcontractors involved in the design of the bicycle and pedestrian facilities. The design meetings will review the Project scope worksheet and preliminary design materials, and develop design alternatives accordingly for bicycle and pedestrian facilities that are included as part of Project development. The meetings will also include discussion on temporary pedestrian traffic control.

20.2.2.3 Pre-Construction Meetings

Schedule at least one pre-construction meeting annually before construction activities start to discuss Work elements, including sidewalks and driveways, curb ramps, traffic operations (e.g., pedestrian signals, pavement markings), and Work zones for pedestrians and bicycles. Ensure all pertinent Contractors and Subcontractors attend. Consideration may be given to holding routine construction meetings for curb ramps. For example, meetings prior to staking and curb ramp construction is recommended.

20.2.2.4 Public and Local Officials Meeting(s)

Public meeting(s) and local officials meeting(s) will be held to refine alternatives for bicycle and pedestrian facilities within the Project as part of the environmental and public involvement processes. These meetings are separate from the meetings described in the WisDOT Standard Specifications for the purposes of providing access to businesses and property owners during construction.

20.2.2.5 Coordination with Other Agencies and Jurisdictions

Review Project scoping materials regarding maintenance agreements for facilities such as sidewalks, crosswalk pavement markings, and bicycle lane pavement markings.

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20.2.3 Equipment/Software

20.2.4 Permits/Authorizations

20.3 Design Requirements

20.3.1 General

Design and construct all facilities shown in the Basic Configuration and Exhibit 20-A within the Project R/W. Preserve, replace (if damaged by construction), or reestablish (if impacted by construction) all existing bicycle and pedestrian facilities to remain within the Project limits. When replacing/reestablishing pedestrian facilities, they must be in full compliance with current minimum ADA accessibility standards, unless technically infeasible. If there are existing physical or site constraints that limit or restrict the ability to meet current minimum ADA accessibility standards, then design criteria are required to the maximum extent feasible, and design decisions must be documented in the Design Study Report (DSR). FDM Section 11-46-5.1 describes technical infeasibility conditions and documentation requirements.

Follow the technical requirements of the WisDOT FDM for RFC drawings depicting bicycle and pedestrian facilities, including shared-use paths. Meet WisDOT ADA Standards, as described in FDM Section 11-46, on all constructed pedestrian facilities.

If Project scoping determined that bicycle and pedestrian accommodations are to be included as part of the Project, and in the design process it is realized that such facilities cannot be established, the circumstances for exclusion and decisions to omit facilities are to be documented. Follow the procedures in FDM Section 11-46-1.3.1, Evaluation Criteria, and attach documentation to DSR.

20.3.2 Investigations/Supplemental Work

20.3.3 Design Criteria

20.3.3.1 Project-Specific Design Criteria

Provide facilities at locations as indicated on Exhibit 20-A.

20.3.3.2 Pavement Markings and Signing

Coordinate with traffic operations on pavement markings and/or signing for crosswalks and marked bicycle lanes at locations as indicated on Exhibit 20-A.

20.3.3.3 Curb Ramps

Provide curb ramps for each leg of crossing shown on Exhibit 20-A, and for any other ramps that are removed, damaged, or otherwise impacted by Construction activities. Ensure the ramp width (excluding flares) matches the width of approaching sidewalk or shared-use path. Design ramps prior to locating traffic control signal equipment and ordering traffic control signal

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equipment. Provide Curb Ramp Construction Details with RFC Plans in accordance with FDM Section 11-46.

20.3.4 Reports and Plans

If full ADA compliance is not met, facilities must meet compliance to the maximum extent, and documentation on technical infeasibility and maximum extent is to be provided. This documentation is to be attached to the DSR as described in FDM Section 11-46. Submit to the Department with the RFC Plans.

Prepare conceptual Plans, including crosswalk locations and pavement markings, to be used for the Curb Ramp Focused Design Meetings and Bicycle and Pedestrian Design Meetings as identified in Sections 20.2.2.1 and 20.2.2.1.

Include bicycle and pedestrian temporary traffic control plan with RFC Plans.

No payment will be made for non-compliant pedestrian facilities, unless Approved by the Department.

20.4 Construction Requirements

20.4.1 General

Install curb ramps per RFC Plans.

20.4.2 Construction Criteria

20.4.3 Materials/Testing Requirements

20.4.4 Instrumentation/Monitoring Plan

20.5 Deliverables

Table 20-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Contractor's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 20-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
Documentation of bicycle and pedestrian accommodation evaluations		20.3.1
Curb Ramp Construction Details		20.3.3.3
ADA Technical Infeasibility and Maximum Extent Documentation		20.3.4

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Name	Acceptance or Approval	Section Reference
Bicycle and Pedestrian Facility Conceptual Plan		20.3.4
Bicycle and Pedestrian Temporary Traffic Control Plan		20.3.4

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EXHIBITS

Exhibits provided in electronic format

Exhibit 20-A Preliminary Plan Set and Scoping Checklist

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21 Railroads

21.1 General

Railroad facilities belonging to [complete name of railroad] have been identified within the Project limits (herein referred to as “the Railroad”). Section 21 provides information relating to the requirements applicable to the Work performed upon or adjacent to the Railroad’s R/W. Abide by and fulfill the requirements related to Railroads as outlined in this section.

21.2 Administrative Requirements

21.2.1 Standards

The Department has an existing stipulation with the Railroad. The stipulation [enter stipulation number] is provided as Exhibit 21-A.

In the event of a conflict between the standards set forth in Book 3 relating to rail facilities, follow the order of precedence set forth below, unless otherwise specified:

- WisDOT Facilities Development Manual
- WisDOT Standardized Special Provisions
- *WisDOT Bridge Manual*
- American Railway Engineering and Maintenance of Way Association (AREMA) standards
- Remaining standards set forth in Book 3

21.2.2 Contacts

21.2.2.1 WisDOT

21.2.2.2 [complete name of railroad]

[contact name]
[contact title]
[name of railroad]
[address 1]
[address 2 (or delete)]
[city], [2-letter state code] [zip+4]

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Phone: [phone]
Email: [email]

Ensure that all questions and correspondence relating to Work with the Railroad are coordinated with the Department's Regional Railroad Coordinator and copied to the Department's PM.

21.2.3 Meeting Requirements

21.2.4 Equipment/Software

21.2.5 Permits/Authorizations

Comply with all requirements of the Railroad safety and access procedures. Refer to Standardized Special Provisions 107-026 and 107-034.

Provide the following additional permits/authorizations:

21.3 Design Requirements

21.3.1 General

Coordinate both the design and construction operations to ensure there will be no impacts to [name of railroad or abbreviation] operations beyond those permitted/authorized.

21.3.2 Investigations/Supplemental Work

The Railroad R/W may include public and/or private underground utilities within the construction area. In addition to contacting Diggers Hotline, notify the Department's Regional Railroad Coordinator and each Railroad owner's underground location service before any Work begins on Railroad property.

[Railroad contact name]
[contact title]
[address 1]
[address 2 (or delete)]
[city], [2-letter state code] [zip+4]
Phone: [phone]
Email: [email]

21.3.3 Design Criteria

21.3.4 Reports and Plans

Submit design Plans to the Department for review. After its review, the Department will submit the Design-Builder's design Plans for review by the Railroad for Work required on Railroad R/W. The Railroad will have up to [##] Days to review the Plans, and will provide written notification of

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its Approval or any conditions of its Approval. Acquire Railroad approval prior to Work commencing on Railroad R/W.

Submit any additional deliverables to the Department in PDF format, and as detailed in the C&M Agreement.

21.4 Construction Requirements

21.4.1 General

Submit signed/sealed shop drawings to Railroad's chief engineering officer at least [##] Days in advance.

21.4.2 Construction Criteria

Comply with the requirements of the stipulation (see Exhibit 21-A).

21.4.3 Instrumentation/Monitoring Requirements

21.5 Deliverables

Table 21-1, which lists Deliverables identified in this section, is not intended to be exhaustive. It is the Design-Builder's responsibility to determine and submit all Deliverables, as required by the Contract.

Table 21-1: Non-exhaustive List of Deliverables

Name	Acceptance or Approval	Section Reference
DT1804	Acceptance	
107-026 or 107-034	Acceptance	

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EXHIBITS

Exhibits provided in electronic format.

Exhibit 21-A Stipulation or other Agreement ([complete name of railroad])

Exhibit 21-B Railroad Project Submittal Package (template)

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