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## I-01.01 Purpose

This manual has been prepared to provide NDDOT employees, consultants, and Local Public Agencies (LPA) with a convenient guide for the policies, procedures, and design values that are presently recommended for the development of plans for federal or state funded highway construction in the State of North Dakota.

This Design Manual is designed to provide guidance on all design activities for the various levels of federal aid streets and highways in North Dakota, from the Interstate system to local streets and highways. The manual also provides guidance on certain state-funded activities, such as maintenance type projects.

Design guidance in this manual consists primarily of information on minimum standards to be followed in design work for the department. General guidance from federal or national organizations, such as the FHWA or AASHTO, is included in the manual by reference.

It does not contain data or design methods that are adequately covered in college textbooks or engineering handbooks, nor does it presume to answer or anticipate all situations which may arise. It does provide a means of conveying the department's experience in the various aspects of highway design, with the expectation that this information used together with good judgment will enable employees, consultants, or other parties doing design work to develop detail plans with a minimum of effort and indecision.

Each user should follow the instructions contained in this manual and thereby achieve a more consistent and uniform application of the department's policies and procedures. Should conflicts exist between this manual and the Standard Specifications or FHWA or AASHTO, the Standard Specifications will prevail.

#### I-01.02 Instructions to User

The information in this manual contains minimum acceptable design values for various roadway features. Some of the information pertains to new and reconstructed highways, while other information covers work on existing highways. The values given in these chapter are acceptable minimums. Higher values for features like the clear zone, stopping sight distance, geometrics, etc. should be used within reasonable economic limits.

These guides are not meant to be applied rigidly to every situation. There will be situations when special site conditions such as environmental, aesthetic, or economic considerations warrant deviation from the values stated in this manual. It may be acceptable to use values below these minimums with the approval of the Design Engineer (or Bridge Engineer for structural designs). In these cases, the reasons and justification for the deviation from the minimum standards should be clearly documented and a design exception processed through appropriate channels. See Section I-06.04 for information on the design exception process.

## I-01.03 Effective Dates

The effective date for the material published in this manual is the date shown on the title page. Also, since it is expected that additions and/or revisions to this manual will be necessary in the future, the date that revisions or additions are effective will be indicated at each of the revised or added paragraphs.

If a project is started after new material is published in this manual, project design should follow the new policies or guidelines given in this manual. However, projects already under development when new material is published will have to be reviewed on a case-by-case basis. If possible, the new guidance should be followed, but it will depend on how much of the design has already been completed and other considerations. The Design Engineer (or Bridge Engineer for structural work) should be consulted whenever there is doubt on which policies or guidelines are applicable.

In some cases, there will be a fixed date when a new design feature must be implemented (for example, there may be a specific deadline set by FHWA for using improved safety appurtenances like guardrail terminals). The Design Engineer will notify designers of any such deadlines, but they generally will not be published in this manual.

## I-02.01 General

The Milestone Program provides a means for scheduling and monitoring the multiple number of prescribed activities required to advance a project to the actual bid opening for a construction contract. The Milestone Program indicates the inter-relationship of activities and establishes a time schedule that will permit the accomplishment of projected completion dates. The Design Division is responsible for managing the Milestone Program.

Projected end dates for the various activities are established by the Milestone Committee, made up of representatives from Design, Environmental & Transportation Services, Bridge, Materials and Research, Local Government, Planning/Asset Management, and Programming Divisions. A meeting is held when a new project is set up or when one of the divisions involved wishes to adjust the time frame for an activity, typically weekly. Projected end dates for the various activities are set after considering workloads, available personnel, and the already established bid opening date.

The Milestone Program may be accessed by NDDOT employees using the mainframe "RIMS#HP" computer system.

## I-02.02 Summary of Milestone Activities/Tasks

On the following pages is a Milestone Activities index in alphabetical order followed by a brief description of the Milestone Activities in sequential order, with their abbreviations. Some of the activities may be seldom used, therefore they may not have a description of the activity listed. It is the intent of this section to identify the general preliminary engineering activities and responsible divisions beginning with project inception and ending with the project bid opening. It is not meant to imply each activity is necessary on each project, nor will the projected completion dates follow the order as presented here. Activities are major work items, while tasks are work items necessary to complete an activity. Appendix I-02 A provides flow charts for certain milestone items. Unless otherwise stated in the activity descriptions, the milestone actual end date represents the completion and submittal of the milestone activity.

## I-02.03 Adding Activities/Tasks or Revising Projected Completion Dates

Bid opening and authorization dates are revised by Programming Division when a new bid opening schedule is published. Activities are added and deleted by the Milestone Committee. Dates for other activities are revised by the Milestone Committee.

## I-02.04 Entering Completion Dates for Activities/Tasks

The Lead Designer, Technical Representative, or responsible division/district enters the actual end (completion) dates for the milestone activities. The milestone team sets the projected end dates and revises the projected actual end dates as required.

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ACACM

MICOM

APPCN

IANTE

# **Description of Milestone Activities**

## **Citizen Advisory Committee Meeting**

Citizen advisory groups are established on complex projects to obtain early public involvement and input on the project. The citizen advisory groups may be comprised of adjacent property owners, businesspeople, the general public, or special interests, as appropriate for the project. Normally, the first meetings with the group are held before the completion of the detailed engineering studies and continue throughout the project development process. The Environmental Document Author will conduct Citizen Advisory Meetings to provide review and comment of project development activities; prepare informational handouts and exhibits, as necessary; prepare and distribute written summary of comments received; and prepare and distribute project newsletter to participants, as necessary.

The milestone actual end date represents the date of the first Citizen Advisory Committee Meeting.

## **Milestone Committee Review**

All projects that are milestoned should have this activity. This activity tracks the number of dates a project has been brought to the Milestone Committee. Previous meeting dates are recorded in the remarks.

The milestone actual end date is when the review committee meets.

## Associated Project PCNs

This activity links multiple related projects or a larger project that was broken down into smaller projects.

The milestone actual end date represents the date that all associated PCNs have been recorded.

## **Interagency Negotiated Timeframe**

This activity is added on high level environmental documents; Environmental Assessments (EA) and Environmental Impact Statements (EIS). Immediately upon notification to FHWA that an EA or EIS will be necessary for the project, the Environmental Document Author will add the activity and set up timeframes which place estimated times for completion on primary steps in the environmental review process. The list of activities and dates will then be sent to outside agencies who have been determined to be primary reviewers on the document. The agencies to which the activities and dates will be sent will be selected based on the nature of the project, and in conjunction with FHWA. The agencies will be asked for their review and concurrence on the dates.

The milestone actual end date represents the date that the concurrence of the activity dates is reached with the agencies solicited.

**Scoping Report** 

This activity is added to any project that requires a scoping report. Scoping reports will not be done on preventive maintenance projects such as seal coats, microsurfacing, thin lift overlays, pavement marking, minor bridge repair. Scoping reports will consist of general project information along with information on traffic, existing roadway characteristics, geometry, structures, adjacent land, other structural and incidental items, proposed performance guidelines, and proposed improvements. They will also include a cost estimate and decision items along with comments from the District Engineer. The Deputy Director for Planning or the Deputy Director for Engineering will sign off on the scoping reports after the scoping meeting is held.

The milestone actual end date represents the date the scoping report is signed by the Deputy Director.

## Traffic Data

The Planning/Asset Management Division - Roadway Data Section provides current and forecast mainline traffic volumes, pavement loadings, and equivalent single axle loadings (ESALS) for the proposed project. This information is used for some traffic operation analysis, to complete safety reviews, and to develop pavement surface thickness recommendations. Preventative Maintenance and Minor Rehabilitation projects only use current traffic volumes for design. Structural Improvement, Major Rehabilitation, and New/Reconstruction projects use 20or 30-year projected volume. The traffic data information should be summarized in the environmental document; it is used to evaluate the appropriate scope of work and to develop the purpose and need for the project.

The milestone actual end date represents the date that the Traffic Data has been completed and RIMS has been updated.

#### Falling Weight Deflectometer

The Materials and Research Division provides falling weight deflectometer data and analysis. This information is used to develop surface thickness recommendations and for the identification of subcut areas.

The milestone actual end date represents the date that the Falling Weight Deflectometer data has been collected and the analysis is complete.

## **District To Get Core Sample**

District obtains existing pavement core samples for the milestone core analysis. Guidance is in the Field Sampling and Testing Manual.

The milestone actual end date represents the date that Core Samples have been taken and sent into the central lab.

#### **Core Analysis**

The Materials and Research Division provides analysis on existing pavement core samples for

#### SCPRP 15

TRAFF 20

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CORE

PACOR

the development of surface thickness recommendations.

The milestone actual end date represents the date that the cores have been submitted by the district and Material and Research's analysis of the cores is complete.

## **Pavement Condition Information**

The Planning/Asset Management Division - Pavement Management Section provides a historical summary of the pavement condition and maintenance costs for the proposed project. Pavement conditions are obtained from Pavement Management data and may include information about pavement distress and ride. The pavement condition information is summarized in the environmental document, and is used to evaluate the appropriate scope of work, and to develop the purpose and need for the project.

The milestone actual end date represents the date that the Pavement Condition Information has been obtained and the information has been distributed.

## **Field Review**

## FDRVW 130

PMS

Generally, a field review will be conducted for all major highway construction projects. The field review is conducted prior to or in conjunction with the beginning of the environmental document. The field review is used to verify office information and to determine if any additional materials testing or traffic analysis is necessary. The field review also provides participants a chance to get an onsite look at the proposed project to discuss project alternatives and possible problem areas.

The Designer and/or Environmental Document Author will conduct a project field review with representatives as required on the distribution list shown on the Reference and Forms page of the Design Manual. Other representatives may be invited as deemed appropriate by the District or LPA. The distribution list can be found at on the Reference and Forms page of the NDDOT website. The Designer and/or Environmental Document Author will prepare preliminary project information and conduct a field review to determine the range of possible alternatives and proposed improvements; and prepare and distribute written summary to meeting participants and districts/divisions after the meeting.

Developing a field review agenda and field review packet (preliminary project information and data available before field review) for attendees is very instrumental in achieving effective results when conducting the field review discussion. The information needed includes engineering data on existing pavement condition, geometry, structures, traffic operations and milestone schedule.

A field review outline and discussion should generally include the following: Visual evaluation of roadway conditions, structures, drainage, railroad crossings, traffic control devices, etc.

Verification of beginning and ending points of the project and compatibility of the proposed project with adjacent segments of the roadway.

Cursory review of presently compiled project information.

Existing typical section

Project history

Purpose and need for project.

Scope of project, possible alternatives, and compatibility of the proposed alternatives with

adjacent segments of the roadway. Identify possible problem areas: Scope of additional surveys and material testing Review existing and potential right of way needs Review structures and conditions Review potential environmental and social issues How will the number and severity of environmental issues affect how the project is advanced? Note any potential 4(f) issues (parks, grasslands, easement wetlands, historic sites, etc.). Railroad Crossing Review. Recommendations should be discussed and included in the environmental document, if applicable. Review Milestone activities and schedule. Scope of additional surveys, if needed Scope of additional material testing, if needed Scope of additional traffic analysis, if needed Extent of public involvement **Review Utilities** Note existing utilities that might be impacted by the project Ask District Utility Coordinator about recent and proposed utility permits within the project limits Extent of possible city/county involvement and participation. The District should have contacted the respective city/county at the time the project was planned so the city/county becomes part of the scoping of the project. Identify the class of action (CE, EA, EIS)

After the field review is completed, a summary of the field review discussion should be documented and sent to the people who attended the meeting and the project file.

The milestone actual end date represents the date that the Field Review is held. If it is agreed that no Field Review is needed, then that date should be entered and a note made in mainframe.

## **Survey Permission**

## SRPER 131

132

106CO

This activity represents when permission is sought for projects on various Federal lands.

## Section 106 Coordination

The Consultant or Internal Lead Designer shall ascertain the scope of work as it relates to Section 106 (preferably after the field review to ensure any added items are included) and coordinate with ETS Division to ascertain the Area of Potential Effect (APE) and level of survey efforts needed (Class I, Class III, both, and other). The Consultant or Lead Designer shall facilitate coordination with ETS by completing and signing the Section 106 Coordination Form and email the form to -grp-DOT Section 106 (dotsection106@nd.gov).

An ETS Cultural Resource Representative shall review the project scope of work, information submitted within the form, and respond to the Consultant or Lead Designer with the applicable APE and level of survey efforts needed for Section 106 consultation, or if the project can be Exempted from further consultation.

Any scope of work changes, revision, or additions to the project shall require an additional form to be submitted as outlined above to document the project changes and facilitate additional

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Section 106 consultation activities as required.

The milestone actual end date represents the date the Consultant or Lead Designer has completed and submitted the signed Section 106 Coordination Form to -grp-DOT Section 106 (dotsection106@nd.gov).

## **Railroad Coordination**

The Consultant or Lead Designer shall ascertain the scope of work as it relates to railway property and features and coordinate with the Railroad Coordination Team to ascertain the requirements of the railway company or companies. The Consultant or Lead Designer must complete the Railroad Coordination Form. The Technical Representative or the Lead Designer will then email the form to –Tm-DOT-Railroad-Coordination (-Tm-DOT-Railroad-Coordination@NDGOV.onmicrosoft.com).

Any scope of work changes, revisions, or additions to the project shall require an additional form to be submitted as outlined above to document the project changes and facilitate additional coordination activities as required.

The milestone actual end date represents the date the Technical Representative or Lead Designer has submitted the Railroad Coordination Form to –Tm-DOT-Railroad-Coordination (-Tm-DOT-Railroad-Coordination@NDGOV.onmicrosoft.com).

## **Project Initiation**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **Draft Coordination Plan**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## Bridge Preliminary Concept

Bridge Preliminary Concepts will be completed by Bridge Division or Consultant. The Bridge Preliminary Concept will document the bridge number, description, current condition, supporting data, and proposed improvements or recommendations for the bridges and box culverts within the proposed project limits. The Bridge Preliminary Concept Report is completed after the field review and appended by reference to the environmental document.

For Consultant projects, Bridge Preliminary Concepts will be prepared by the Consultant performing the structural work. Bridge Division will provide any available information, such as most recent inspection, existing asbuilt plans, load rating or other information as deemed necessary to assist in the completion of this activity. Bridge Preliminary Concepts must be submitted to the Bridge Division for review and approval prior to proceeding with preliminary Bridge Design activities.

The milestone actual end date represents the date that the Bridge Preliminary Concept has been completed and distributed.

## **Resource Agency Meeting**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## Notice of Intent

When a proposed project requires an Environmental Impact Statement (EIS), a NOI is prepared for publication in the Federal Register. The NOI initiates the EIS process and summarizes the proposed project and scoping process. The format and content of the NOI are specific and must be strictly adhered to as provided in the FHWA Technical Advisory Guidance Material. The Environmental Document Author in conjunction with Environmental Services will prepare a NOI in accordance with FHWA Technical Advisory Guidance Material.

The milestone actual end date represents the date that the NOI is submitted to FHWA.

# Notice of Availability NOAVL 151

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **Coordination Plan**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **Solicitation of Views**

The various SOV form letters and Master SOV List are located on the Reference and Forms page of the NDDOT website.

The Environmental Document Author or Consultant will email solicitation of views letters to agencies, associations, or officials as designated on the Master SOV List that may have an interest in the proposed improvements. A copy of the letters emailed, mailing list recipients, and all comments received shall be incorporated into the environmental document as an appendix.

The milestone actual end date represents the date that the Solicitation of Views letters have been emailed or distributed to the various recipients.

## Management Presentation

A management presentation will occur after the initial field review, and before the development of the environmental document. The purpose of this meeting is to provide project information to management and to receive guidance and direction on the project scope. This early management concurrence of the scope of proposed improvements is an effort to streamline and improve the efficiency of the project development process and reduce the time spent developing the formal environmental document.

The designer, environmental document author, or consultant will provide a presentation to management that summarizes the scoping and field review activities. The presentation shall be

## RAM 146

NOINT

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SOLVW 160

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complete with existing roadway data and photographs, current roadway standards, and options for resurfacing, restoration, rehabilitation, potential environmental issues, public concern, reconstruction, and preliminary cost estimates.

Attendees at the presentation should include: \*Deputy Director for Engineering \*Deputy Director for Planning \*Director of Project Development \*Director of Operations affected City/County Representatives all engineering Division/District Engineers & Assistants FHWA (as necessary): District Operations Engineer

\* At least two of the above asterisked attendees must be able to attend the management presentation or the presentation needs to be rescheduled.

The milestone actual end date represents the date that the Management Presentation was held.

CHAR

PIMTG

PINFO

## Design Charrette

A cadre of Designers collaboration.

## Public Input Meeting

See Chapter II Section 3 of the Design Manual for information. The Public Input Meeting Legal Display Advertisement and Press Release can be found on the Reference and Forms page of the NDDOT website.

Public input meetings provide an early opportunity for the public and other agencies to comment on the need for the project, discuss and suggest project alternatives, and identify areas of concern. The Environmental Document Author will coordinate meeting location and time, advertise meeting, and invite meeting attendees, prepare informational handouts and exhibits, conduct public input meeting, and prepare and distribute the Public Involvement Report. Public Input Meetings can be either a traditional format with a formal presentation, open-house format, virtual format with a live or pre-recorded presentation, or a combination of all above.

The milestone actual end date represents the date that the Public Input Meeting is held.

## **Public Information Meeting**

See Chapter II Section 3 of the Design Manual for information. The Public Information Meeting Legal Display Advertisement and Press Release can be found on the Reference and Forms page of the NDDOT website.

Public Information Meetings provide an opportunity to inform the public and other agencies of the project proposal, and not necessarily receive input from the public. The Environmental Document Author will coordinate meeting location and time, advertise meeting, invite meeting attendees, prepare informational handouts and exhibits, conduct public information meeting and prepare and distribute the Public Involvement Report. Public Information Meetings can be either a traditional format with a formal presentation, open-house format, virtual format with a

live or pre-recorded presentation, or a combination of all above.

The milestone actual end date represents the date that the Public Information Meeting is held.

## Public Hearing

See Chapter II Section 3 of the Design Manual for information on conducting a Public Hearing. The Public Hearing Legal Display Advertisement and Press Release can be found on the Design Manual- Reference and Forms page of the NDDOT website.

Public hearing meetings provide an opportunity for the public and other agencies to comment on the proposed improvements identified in the DCE, Environmental Assessment, or Environmental Impact Statement, and to discuss and comment on the social, economic, environmental, or other areas of concern regarding the project. The Environmental Document Author will coordinate meeting location and time; advertise meeting and invite meeting attendees; prepare informational handouts and exhibits; conduct public hearing meeting; and prepare and distribute the Public Involvement Report for CatEx projects. For projects processed under an EA or EIS, the materials shall be contained in the appendices.

The milestone actual end date represents the date that the Public Hearing is held.

#### **Public Involvement Report**

After the public comment response period has passed for Public Input Meetings or Public Hearings, the Public Involvement Report (PIR) is prepared by the Environmental Document Author. The PIR should include the following: when and where it was held; affidavit of publication including a copy of the Public Hearing Legal Display Advertisement; Press Release including a copy of the email distribution from Communications Division; an explanation of the Public Meeting(s); a copy of any handouts; a copy of the exhibits presented; the video script (if video was used); Power Point slides; a copy of the roster; transcript; a copy of all comments received and responses provided; and any other information about the Public Meeting(s).

The milestone actual end date represents when the PIR has been distributed to appropriate persons.

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-	Structural Improvements	SRSIM	237
	Major Rehabilitation	SRMAR	238

This work is identified in Chapter III Section14 of the Design Manual for Minor Rehabilitation, Structural Improvements, and Major Rehabilitation projects.

Safety Reviews fall under the following investment strategy categories:

Safety Review – Minor Rehab (SRMIR), Safety Review – Structural Improvements (SRSIM), Safety Review – Major Rehab (SRMAR).

The safety review is used to determine the existence and location of roadside obstructions and to propose cost effective roadside safety improvements for the proposed project. The recommendations of the safety review should be summarized in the environmental document; it is used to evaluate the appropriate scope of work and to develop the purpose and need for the project.

PUBHR 207

PIR 210

The milestone actual end date represents the date that the Safety Review has been completed and the Lead Designer has been notified.

## **Traffic Operations**

The Programming Division – Traffic Operations Section or consultant provides traffic operations analysis and report consisting of lighting, crashes, capacity, traffic control, and recommendations. Traffic operations analysis and reports will be completed for Structural Improvement, Major Rehabilitation, New/Reconstruction, and sometimes Safety projects. The information provided in the traffic operations report is included in the environmental document and is used to develop the appropriate scope of work and to develop the purpose and need for the project.

The milestone actual end date represents the date that the Traffic Operations report has been completed, approved, and the information has been distributed.

## **Decision Document**

The Decision Document is used to make decisions on the project during the project development phase, but is not included in the environmental document. A Decision Document may also be needed when questions/concerns that have arose during the design phase that need decisions. The Environmental Document Author or Lead Designer prepares the Decision Document and distributes it to the Offices, Engineering Divisions, Districts, FHWA, and other interested parties for review and comment. The Environmental Document Author or Lead Designer then revises the document and submits it for approval and decisions.

The Decision Document consists of a cover sheet, certification page, table of contents, introduction (background), proposed improvements, comments, decisions, and an appendix if needed.

The milestone actual end date represents the date of the completion and approval.

## Structure Type Study

The Bridge Division or Consultant will perform a Structure Type Study to determine rehabilitation or replacement alternatives for a project. The Study should include an analysis of estimated time to complete the environmental document, areas of concern, and permitting challenges associated with each of the alternatives. The Study should include enough preliminary analysis and design to allow for adequate comparison of the alternatives.

The milestone end date represents the date that the Structure Type Study is completed and approved by the NDDOT Bridge Division.

## **Preliminary Structure Hydraulics**

The Bridge Division or Consultant will perform a preliminary hydraulic analysis to aid in structure type selection. Conduct preliminary engineering and hydraulic studies to determine the required opening size for the proposed replacement, as specified in Chapter V of the NDDOT Design

DECD 257

260

265

STS

PSHYD

Manual.

The milestone end date represents the date that the Preliminary Structure Hydraulics is completed and approved by the NDDOT Bridge Hydraulics Section.

## **Preliminary Roadway Hydraulics**

The Bridge Division or Consultant will perform a preliminary hydraulic analysis to determine design peak flows and required opening size for culverts, as specified in Chapter V of the NDDOT Design Manual.

The milestone actual end date represents the date that the Preliminary Roadway Hydraulics, including analysis and calculations, have been completed and approved by the NDDOT Bridge Hydraulics Section.

## **Pavement Design**

The Materials and Research Division provides HMA pavement, PCC pavement, and aggregate base thickness recommendations and pavement design life. Asphalt Depth Core Data is normally included to establish existing surfacing depths and to develop blended base projects. This information is included in the environmental document and is used to develop the appropriate scope of work and proposed project improvements. The report should document the engineering analysis used to determine the recommendations.

The milestone actual end date represents the date that the surface information has been obtained and the information has been distributed.

## Wetland Delineation – Office

A wetland delineation using readily available references to determine where wetlands lie within the project area. Unless told otherwise, the environmental document author will be responsible for doing the office delineation.

This milestone actual end date represents the date of the completion of the office wetland delineation and submittal of a complete delineation report and shape files.

## Wetland Delineation – Field

An on-site wetland delineation. The field delineation will be conducted in accordance with the United States Army Corps of Engineers publication "Corps of Engineers Wetlands Delineation Manual" January 1987 - Final Report (87 Manual).

This milestone actual end date represents the date of the completion of the field wetland delineation and submittal of a complete delineation report and shape files.

## Wetland Jurisdictional Request

Office and/or field delineations require USACE review to determine if the wetlands contained

#### PVMTD 267

#### WETDO 270

#### WETDF 271

WJREQ

273

#### PRHYD 266

within the project limits are jurisdictional.

Consultants will transmit all delineation documentation, along with SOV letter #2 to Environmental Services through the Technical Representative. Upon satisfactory review of the delineation by Environmental Services, Environmental Services will submit the information provided by the Consultant, or internal delineations, to the USACE requesting a wetland jurisdictional determination. The information will be placed in FileNet and a link will be provided to the Document Author. For Local entity projects, the Local Government Technical Representative will transmit all delineation documentation after a satisfactory review by the Rural Program Manager.

The milestone actual end date represents the date that the request was sent to the USACE for review.

## **Jurisdictional Determination**

After the submittal of a Wetland Jurisdictional Request, the USACE will respond with a Wetland Jurisdictional Determination.

Upon receipt of the Jurisdictional Determination from the USACE, the wetland table and maps are updated by the entity who completed the delineation and placed into FileNet, a link sent to Environmental Services through the Technical Representative (if applicable), and the original is sent to the Environmental Document Author.

The milestone actual end date represents the date that the determination was made by the USACE.

## Class III Cultural Resource Inventory CLIII 279

Will be determined by ETS Cultural Resources Staff if needed.

## Section 106 Application

106AP 280

JRDET

The Consultant or Lead Designer shall complete and submit the Request for Concurrence form along with the final Class I or Class III cultural survey report. A draft Class I or Class III cultural survey report shall be submitted for review and approval to the ETS Cultural Resource Representative a minimum of 2 weeks prior to the milestone date.

The ETS Cultural Resource Representative shall initiate Section 106 consultation by submitting the Request for Concurrence form and final cultural survey report to either the ND State Historic Preservation Office (NDSHPO) or the applicable Tribal Historic Preservation Office (THPO) for concurrence. In some cases, Section 106 consultation may also include additional coordination with FHWA, the ACHP, or adjacent state SHPOs for border projects.

The milestone actual end date represents the date the Consultant or Lead Designer has submitted the Request for Concurrence form and final accepted cultural survey report to the ETS Cultural Resource Representative.

#### Section 106 Compliance

106 281

Section 106 activities are typically completed through written concurrence by NDSHPO or the applicable THPO. In some cases, Section 106 Compliance may also include additional consultation with FHWA, the ACHP, or adjacent state SHPOs for border projects. The historic properties effect determination from the Section 106 consultation shall also be entered within the milestone task comments by the ETS Cultural Representative including the NDSHPO concurrence number, THPO concurrence number, or if the action was Exempted from further consultation.

The milestone end represents the date Section 106 Compliance has been received or completed by the ETS Cultural Resource Representative. The milestone actual end date represents the date all Section 106 activities have been completed.

#### 289 **Endangered Species Act Consultation** ESACO

The Department must comply with Section 7 of the Endangered Species Act (ESA) for all federally involved projects. Compliance with Section 7 results in one of three affect determinations for a listed species or critical habitat: "no effect"; "may affect, but not likely to adversely affect"; or "may affect, and is likely to adversely affect". These affect determinations are covered under various documents. Projects with a "may affect, and likely to adversely affect" determination must be covered under a project specific Biological Assessment, which is a separate milestone task. See Section 7 ESA Guidance on the References and Forms page of the NDDOT website for further information.

The ETS Biologist will enter the actual end date in RIMS and depending on which documents are used to fulfill Section 7 ESA requirements for a project, the milestone actual end date represents:

The date that the NDDOT ESA Affect Determination table has been filled out. Note - If NDDOT Biologist review is not required for any species or critical habitat, the Environmental Document Author or Technical Representative shall notify the ETS Biologist when the table has been completed.

The date that the Section 7 Affect Determination Package has been signed by the ETS Biologist.

The date the ETS biologist signs the project submittal package to be covered under the FHWA/NDDOT Programmatic Biological Assessment (PBA).

## **Biological Assessment- USFWS**

The Department must prepare a project-specific Biological Assessment (BA) when a project has potential for adverse effects to listed resources protected under the Endangered Species Act (formal consultation). The ETS Biologist or consultants will prepare the BA, which will include an effects analysis for all listed species or critical habitat that may be exposed to project activities. After the BA has been written and any required fieldwork completed; the BA will be sent to FHWA after internal review. When the document is approved by FHWA, it will be submitted to USFWS. The USFWS may take up to 135 days to complete formal consultation and issue a **Biological Opinion**.

The milestone actual end date represents the date that USFWS issues a Biological Opinion agreeing with the determination made in the BA. The ETS Biologist will enter the actual end

#### BIOAS 290

date in RIMS.

## Biological Evaluation- USFS

BIOEV 291

The Department must prepare a Biological Evaluation (BE) when a project occurs on U.S. Forest Service (USFS) land. Environmental staff or consultants will prepare the BE, which will include an effects analysis for all USFS species of concern (including both plant and animal species). After the BE has been written and any required fieldwork completed; the BE will be sent to FHWA after internal review. When the document is approved by FHWA, it will be formally submitted to USFS for concurrence. Concurrence from the USFS may take up to 6-8 months, dependent upon the project.

The milestone actual end date represents the date that the USFS issues a concurrence letter agreeing with the determinations made in the BE. ETS will enter the actual end date in RIMS.

## Noise Analysis

Conducted for a proposed project that meets the definition of a Type I Project per CFR 772. Complete the Type 1 Project Determination form and refer to NDDOT's Noise Policy and Guidance document to determine if a proposed project meets the criteria of a Type I Project and requires completion of a Highway Traffic Noise Analysis. Type I Projects typically include construction of a highway on new location, the physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes. These can include projects such as urban street reconstruction, rural and urban construction on new alignment, lane addition projects, new construction on urban freeways, or construction of new freeways. Coordinate with Environmental Services to complete the Noise Analysis and required FHWA coordination.

The milestone actual end date represents the date that FHWA has concurred on the findings of the analysis.

## Work Zone Safety & Mobility

Although work zone safety and mobility are required on all projects with work zone traffic control, the milestone activity Work Zone Safety & Mobility is included on projects that are determined to be significant. The activity is completed during the development of the environmental document.

The milestone actual end date represents the date the Work Zone Safety & Mobility plan is approved. This is typically the same time the environmental document is approved.

## CatEx by Definition

The CED Checklist, CED Checklist Instructions, and CED Work Types are found on the Design Manual- Reference and Forms page of the NDDOT website. See Chapter II Section 2 of the Design Manual for more information.

The CatEx by Definition (CED) Checklist is an environmental document for projects that are typically preventive maintenance type projects, but can also include minor safety, structure,

## WZSM 299

CED

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## NOISA 298

earthwork, right of way, and other various work. Only projects and work types listed within the CED Work Types may utilize the CED Checklist for environmental documentation, coordination, permitting, consultation, and approval.

The milestone actual end date represents the date the CED has been completed, approved, and placed in FileNet.

## **Draft Programmatic CatEx**

DPCE 303

Refer to the CatEx Workflow on the Reference and Forms page of the NDDOT website and Chapter II Section 2 of the Design Manual for more detailed instructions.

The Draft Programmatic CatEx (PCE) is submitted to the NEPA Liaison for review. Allow for a 2week initial review time. After the draft PCE has been reviewed by the NEPA Liaison, it is distributed according to the Preliminary Engineering Distribution List for comments. A 2-week comment/circulation period is desirable for most projects.

The milestone end date represents the date the Draft Programmatic CatEx has been submitted for review.

## Programmatic CatEx

## PCE 304

The PCE/DCE Template, Environmental Impact Checklist, CatEx Workflow, and SOV Letters and mailing list are found on the Reference and Forms page of the NDDOT website. See Chapter II Section 2 of the Design Manual for more information.

Any project or work type not listed within the CED Work Types will typically utilize either a Programmatic CatEx (PCE) or Documented CatEx (DCE) for environmental documentation. PCEs are utilized when the Programmatic Categorical Exclusion Agreement (PA) thresholds are not expected to be exceeded, and DCEs are utilized when the PA thresholds are expected or may be exceeded.

The PCE or DCE shall follow the instructions within the PCE/DCE Template for the various executive summary categories and will vary in length depending on the complexity and number of alternatives for the project. PCEs and DCEs will attach a detailed list of environmental questions contained within the Environmental Impact Checklist which identify any additional supporting documentation to be included either in the appendix or appended by reference. PCEs and DCEs are similar documents but vary in the number of required questions within the Environmental Impact Checklist.

The milestone end date represents the date the Programmatic CatEx (after addressing all comments from the Draft PCE) has been completed, approved, and submitted for final signature using DocuSign.

## Draft Documented CatEx

## DDCE 305

Refer to the CatEx Workflow on the Reference and Forms page of the NDDOT website and Chapter II Section 2 of the Design Manual for more detailed instructions.

The Draft Documented CatEx (DCE) is submitted to the NEPA Liaison for review. Allow for a 2-

week initial review time. After the draft DCE has been reviewed by the NEPA Liaison, it is distributed according to the Preliminary Engineering Distribution List for comments. A 2-week comment/circulation period is desirable for most projects.

The milestone end date represents the date the Draft Documented CatEx has been submitted for review.

#### Documented CatEx

#### DCE 306

The PCE/DCE Template, Environmental Impact Checklist, CatEx Workflow, and SOV Letters and mailing list are found on the Design Manual- Reference and Forms page of the NDDOT website. See Chapter II Section 2 of the Design Manual for more information.

Any project or work type not listed within the CED Work Types will typically utilize either a Programmatic CatEx (PCE) or Documented CatEx (DCE) for environmental documentation. PCEs are utilized when the Programmatic Categorical Exclusion Agreement (PA) thresholds are not expected to be exceeded, and DCEs are utilized when the PA thresholds are expected or may be exceeded.

The PCE or DCE shall follow the instructions within the PCE/DCE Template for the various executive summary categories and will vary in length depending on the complexity and number of alternatives for the project. PCEs and DCEs will attach a detailed list of environmental questions contained within the Environmental Impact Checklist which identify any additional supporting documentation to be included either in the appendix or appended by reference. PCEs and DCEs are similar documents but vary in the number of required questions within the Environmental Impact Checklist.

The milestone end date represents the date the Documented CatEx (after addressing all comments from the Draft DCE) has been completed, approved, and submitted for final signature using DocuSign.

## Documented CatEx Addendum

For CatEx projects (CED, PCE, or DCE) a CatEx Addendum will be completed for any additional actions or alternatives that are added after the original CatEx approval. The CatEx Addendum will generally consist of a cover sheet and a written summary of the added or proposed work. Any changes to the environmental impact categories, additional field studies, consultations, and coordination will be summarized and addressed. The SFN 18878 form will be completed, and the "Addendum" checkbox will be checked. If the original CatEx required FHWA approval, a courtesy copy of the CatEx Addendum will be forwarded to FHWA with FHWA approval only required if any new PA thresholds are exceeded. If the original CatEx was approved by the NDDOT, the CatEx Addendum will be approved by NDDOT (ETS Division) provided no PA thresholds are exceeded.

The milestone end date represents the date the CatEx Addendum has been completed, submitted, and approved.

## **Categorical Exclusion**

## CATEX 308

DCEA

307

Projects that do not individually or cumulatively have a significant environmental effect and do

not require an EA or EIS. A listing of projects that normally fall into this category is contained in 23 CFR 771.117, paragraphs (c) and (d).

The milestone actual end date represents the date that the CATEX has been approved by FHWA.

## **FHWA Notification**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **Environmental Document**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## Programmatic Section 4(f) Compliance

Section 4(f) refers to part of the 1966 U.S. Department of Transportation Act, which gave specific protection to certain classes of public properties. These lands include public parks, recreation areas, wildlife and waterfowl refuges, and most Historic Properties (i.e., cultural resources eligible for the National Register of Historic Places).

Whenever a project involves such properties, a Section 4(f) document must be prepared for each location before the land use is approved. The 4(f) document shows that the provisions of the law are met. The Environmental Document Author should coordinate the need and preparation of Section 4(f) documentation with Environmental Services.

The milestone actual end date represents the date that the Section 4(f) Evaluation is complete.

# Interchange Justification Report IJR 312

A request made to FHWA by NDDOT that provides written documentation to support the formal request and the documentation of the coordination with other agencies. Early coordination between NDDOT and the FHWA Division office is recommended to refine the scope of the analysis and to make an initial determination if the project is reasonable. This coordination will allow for the project analysis to be performed in a cost-effective manner and provide for a more effective review of the request.

The request is required to be a standalone document. Referencing information that is needed to support decision making in other documents is discouraged. Relevant information from these documents should be provided in the appropriate section of the access request. Excerpts may be included as appendices.

NDDOT is responsible for ensuring that the collection of all data, conducting of all required analysis and development of the required documentation is compete, correct and appropriate for the proposed change in access.

The milestone actual end date represents the date the request has been approved by FHWA.

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## FHWAN 309

ED 310

SEC4F

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## Milestone Program Revised 9/4/2024

## 6FPRO

Section 6(f) Compliance Section 6(f) refers to a portion of the 1965 Land and Water Conservation Fund Act (L&WCF). This act provides grants to communities to be used for acquiring or improving lands for recreation uses. Transportation projects which acquire land that has received a Section 6(f) grant are considered to be converting the use of the land. When this occurs, replacement lands must be acquired.

Whenever a project involves such properties, a Section 6(f) document must be prepared for each location before the land use is approved. The 6(f) document shows that the provisions of the law are met. The environmental document author should coordinate the need and preparation of Section 6(f) documentation with Environmental Services.

The milestone actual end date represents the date that the Section 6(f) process, coordination, and approval are complete.

## Assign Project Designer

This activity is a tracking device for who is responsible for the roadway, traffic control or bridge design and who is assigned as Right of Way Agent, Utility Coordinator, Environmental Representative, and Technical Representative.

This milestone actual end date represents the date that the activities have been assigned.

## **Airport Clearance**

The Design Division - Roadway Design, Utilities Coordinator will coordinate the survey and prepare an FAA airport clearance permit (Notice of Proposed Construction or Alteration). The Lead Designer should begin coordinating with the Utilities Coordinator after the environmental document approval, and on an ongoing basis as the preliminary roadway design becomes available.

The milestone actual end date represents the date that the Airport Clearance Permit has been obtained.

Alternatives Public Workshop	APW	350
As needed and applicable, or as otherwise described in scop	e of work.	
Archaeological Testing	ARCHT	351
As needed and applicable, or as otherwise described in scop	e of work.	
Preliminary Environmental Assessment	PEA	353

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

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## 313

#### PDSGR 330

AIRCL 331

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Draft Environmental Assessment	DEA	354

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **Environmental Assessment**

These are projects in which the significance of the environmental impacts are not clearly established and require an EA to determine the necessary environmental documentation. The EA is prepared in accordance with FHWA Technical Advisory Guidance Material. The EA normally consist of a cover sheet, table of contents, purpose and need for action, alternatives, impacts, comments and coordination, appendices. The EA shall be revised as required following agency and public involvement and department review.

The milestone actual end date represents the date that the EA is sent to FHWA for review.

## Environmental Site Assessment- Phase I EAP1

The Phase I ESA assesses the likelihood that a site is contaminated through visual observations, historical use reviews and regulatory records, and interviews. If recognized environmental conditions (REC) or historical recognized environmental conditions (HREC) are found, the Consultant should make the recommendation of whether a Phase II ESA should be completed or not.

The actual end date is the date that the Environmental Services has approved the document.

## Environmental Site Assessment- Phase II EAP2 357

A Phase II ESA assesses whether contamination is in fact present. During the Phase II ESA, soil, groundwater, and/or soil vapor samples are collected from the subsurface to analyze for contamination. If contamination has been found, further coordination with Environmental Services will be required.

The actual end date is the date that the Environmental Services has provided a decision.

## Memorandum of Agreement

Memorandum of Agreement (MOA) is a document detailing roles and responsibilities for all parties involved in a project, plan or coordinated effort. MOAs are not legally binding but serve the purpose of establishing a relationship and buy in from all parties.

The actual end date is the date that the MOA is signed by all parties.

## **Preliminary EIS**

As needed and applicable for EIS projects, or as otherwise described in scope of work.

PEIS 380

## MOA 360

EA

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Preliminary Section 4(f) Evaluation	P4F	381

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## Draft EIS

Draft Environmental Impact Statement. These are projects which may significantly affect the environment and require an EIS. The DEIS is prepared in accordance with FHWA Technical Advisory Guidance Material. The DEIS normally consists of a cover sheet, summary, table of contents, purpose and need for action, alternates, affected environment, environmental consequences or impacts, list of preparers, list of DEIS distribution, comments and coordination, index, appendices, and Section 4(f) and 6(f) evaluations.

The milestone actual end date represents the date that the Draft EIS is sent to FHWA for review.

## **Draft Section 4F Evaluation**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **AV Presentation**

The Environmental Document Author will provide an audiovisual presentation for the public hearing, and will prepare the script for the presentation. The Environmental Document Author will provide the necessary project information and coordinate this work activity to ensure completion of the presentation for the public hearing.

The milestone actual end date represents the date that the Environmental Document Author completes the AV presentation.

## Legal Sufficiency Review

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## **Tribal Consultation**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work. Tribal Consultation is primarily conducted and completed through the Tribal Consultation Committee.

## FONSI

Finding of No Significant Impact. The FONSI summarizes the selected project alternative and mitigation measures and is completed for projects that require an EA. The FONSI normally consists of a cover sheet, summary of selected alternates, summary of environmental commitments, summary of agency and public comments received on EA and department responses, and a request that a finding of no significant impact be made. Environmental

AVPRE 410

D4F

TRIBC 450

LEGSR

FONSI

420

475

386

DEIS 385

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Services will prepare a FONSI in accordance with FHWA Technical Advisory Guidance Material.

The milestone actual end date represents the date that the FONSI has been approved by FHWA.

## **Final Environmental Document**

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## Final EIS

Final Environmental Impact Statement. The FEIS is prepared following the circulation of the DEIS for public and agency comments, and public hearing. The FEIS normally consists of reference or revision of DEIS, selection of preferred alternates and basis of decisions, selection of mitigation and enhancement measures, environmental findings, results of coordination, summary of agency and public comments received on DEIS and department responses, final Section 4(f) and 6(f) findings. The environmental document author in conjunction with Environmental Services will prepare a FEIS in accordance with FHWA Technical Advisory Guidance Material.

The milestone actual end date represents the date that the FEIS is completed.

## Final Section 4F Evaluation

As needed and applicable for EA or EIS projects, or as otherwise described in scope of work.

## Reevaluation

See Chapter II-02.06 of the Design Manual for more detail.

Sometimes there are changes to the proposed action, new information or circumstances, or there is a lapse of time between preparation of the environmental document and implementation of the action (typically 3 years or more). This may trigger the need to revisit the NEPA analysis and complete a Reevaluation.

The milestone end date represents the date the Reevaluation of the environmental document has been completed and approved.

## **Conditional Categorical Exclusion**

This activity will be added by the Environmental Document Author when a categorical exclusion (CATEX) is received which has conditions included in the CATEX authorization. The condition should be included in the remarks area of the milestone activity.

The milestone actual end date represents the date upon which the condition in the CATEX is satisfied.

#### REVAL 489

CCATX

FED

FEIS

F4F

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480

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## **Gravel Prospecting**

GRAVL 495

The Materials and Research Division provides gravel and prospecting information for aggregate materials and provides pit plats and boring logs for inclusion into the plan sheets when it is available.

The milestone actual end date represents the date that the pit plats and boring logs have been completed and distributed to the Lead Designer or Technical Representative.

Relocation Identification	RELID	501
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As needed and applicable prior to the environmental document approval, or as otherwise described in scope of work. This task is to identify potential relocations and identify availability of replacement housing and replacement business locations on the market.

Survey-	Ground	GRND	503
-	Aerial	ARIAL	510
	Mobile	MOBIL	511

This work is identified in the Design Division-Survey Manual. 90-1 surveys are identified in chapter 18 of the Survey Manual and typically utilize Ground Survey.

Surveys may consist of identifying or reestablishing public land survey corners, horizontal and vertical control, topography, utilities, signing, and hydraulic data, etc. Ground, Aerial, and Mobile Survey represents the technique being utilized to collect data. Ground Survey may consist of GPS, static LiDAR, total station, etc. Aerial Survey represents a manned aircraft or drone being utilized to collect aerial imagery and/or LiDAR. Mobile Survey represents the use of a Mobile LiDAR unit. These surveys are normally completed by the Preliminary Surveys Section or a Consultant. The districts normally complete 90-1 surveys and may perform small ground surveys.

The milestone actual end date represents the date that the Ground/Aerial/Mobile Survey information has been transmitted.

## Survey Transmittal

The completed survey will be transmitted (given) by the Preliminary Survey Section of Design Division to the Records Management Section. All completed surveys from consultants are sent to Preliminary Survey Section and are then transmitted through the above process.

The milestone actual end date represents the date that the completed survey is transmitted to Records Management and will be entered/ recorded by the Preliminary Surveys Section.

## Additional Survey

If a survey is completed and the project is not designed and/or let to contract, additional Ground/Aerial/Mobile survey information may be needed to update the existing survey. A survey would be done to pick up the additional data and this information is transmitted by the Preliminary Survey Section of Design to the Records Management.

ADSVY

TRANS 515

The milestone actual end date represents the date that the additional survey information has been transmitted to the Records Management and will be entered/ recorded by the Preliminary Surveys Section.

## **Record Of Decision**

The ROD summarizes the selected project alternative and mitigation measures and is completed for projects that require an EIS. The ROD normally consists of a cover sheet, summary of selected alternates and basis of decision, summary of alternatives considered and basis of decision, summary of Section 4(f) and 6(f) basis of decision, summary of measures to minimize harm and environmental commitments, summary of monitoring and enforcement program, summary of agency and public comments received on EIS and department responses, and a signature block. The environmental document author in conjunction with Environmental Services will prepare a draft ROD in accordance with FHWA Technical Advisory Guidance Material and will submit it to FHWA for comment and finalization.

The milestone actual end date represents the date that the ROD has been approved by FHWA.

## Preliminary Engineering (PE) Agreement

The Programming Division or Local Government Division will provide a Preliminary Engineering Agreement with affected LPAs. This agreement states that if the LPA should unilaterally and voluntarily terminate the agreement by whatever means or action, the LPA will reimburse NDDOT for any and all costs it has incurred for engineering services under the agreement.

The milestone actual end date represents the date that the Preliminary Engineering Agreement has been signed by all parties involved.

## Preliminary Utility Coordination

This work is identified in Section III-Section 08 of the Design Manual and in the "Coordination and Notification for Utility Relocation, Adjustments, and Reimbursement Policies and Procedure" manual on the NDDOT website.

This meeting will discuss the alternate selected for the project and any preliminary potential utility impacts, review any available preliminary information or comments from the SOV letters, and discuss future utility coordination. This milestone activity also indicates when the Lead Designer or Consultant and Technical Representative have provided the following deliverables needed for utility coordination letters:

Title Sheet Scope of Work Sheets Preliminary Utility Coordination Form

The NDDOT Utilities Coordinator or Consultant will send a preliminary utility coordination letter to all potential impacted Utility Co. after this meeting requesting comments, share preliminary information, or further correspondence with Utility Company.

The desired schedule date is 2 weeks after the CATEX. This milestone actual end date represents the date the Lead Designer or Consultant and Technical Representative have met,

#### ROD 520

## UTPRE 551

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PEAGR

discussed, and coordinated with the NDDOT Utilities Coordinator. The Actual Completion Date for this activity shall be recorded in milestone by the Lead Designer or Technical Representative.

## Preliminary Utility Engineering

This work is identified in Section III-08 of the Design Manual and in the "Coordination and Notification for Utility Relocation, Adjustments, and Reimbursement Policies and Procedure" manual on the NDDOT website.

This coordination is to ascertain the location and extent of any utility relocations necessary to accommodate the planned project including any state optioned borrow sites, and where feasible and within acceptable design standards, to avoid relocation or adjustment of major or costly utilities without changing the scope of the project. The NDDOT Utilities Coordinator or Consultant may at this time request comments, share information, or further correspondence with Utility Co.

The desired schedule date is 6 months before the project completion date. This milestone actual end date represents the date when draft plans, including cross sections, have been refined enough to complete utility conflict plans. At this point coordination between the Utility Coordinator, Lead Designer or Consultant and Technical Representative should be sufficient to have minimized or eliminate utility impacts. Utility Engineering has been completed to a point where changes to the amount of impacts are not anticipated. The Actual Completion Date for this activity shall be recorded in milestone by the Lead Designer or Technical Representative.

## Structure Hydraulics

The Bridge Division or Consultant will perform a Hydraulic Analysis and Structure Selection Report at the bridge and box culvert locations that require replacement. After the completion of the report, the Bridge Division or consultant will conduct a Type, Size, and Location (TS&L) and prepare and distribute a written summary.

The milestone actual end date represents the date that the Hydraulic Analysis and Structure Selections Report and TS&Lsummary is approved.

## **Roadway Hydraulics**

Bridge Division or the Consultant will perform a Hydraulic Analysis to determine the appropriate size of culverts for replacement of existing culverts or new culverts.

The following hydraulic analysis and calculations for both centerline and approach culverts shall be submitted for review and approval concurrently with the submission of the PS&E plans. The submitted hydraulic analysis and calculation shall include: Delineated drainage areas shown on a map: Label drainage area size Label longest drainage path and slope Label each culvert stationing

USGS Regression Calculations or Rational Method Calculations.

HY-8 or other computer-generated output, which was used to determine culvert size, including design discharge, design headwater, velocity, and other data required to prepare the hydraulic

## STHYD 561

UTENG

# RDHYD 562

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data sheet in the plans.

The milestone actual end date represents the date that the Hydraulic Analysis and calculations have been approved by the Hydraulics Section.

## **Geometric Roadway Design**

The milestone activity is used as needed and applicable, or as otherwise described in scope of work. The work includes providing roadway alignments and modeling for other dependent activities such as impact analysis or right of way limits.

## Linear Soil Survey

The Geotechnical Section of Materials and Research Division or Consultant will provide Linear Soil Survey Report and Recommendations. The report identifies soil classifications, properties, moisture contents, and design recommendations. The design recommendations generally address subcuts, scarification, compaction, backfill materials, slopes, geotextile fabrics, etc. The Linear Soils Reports are required on projects with scopes at a level of Minor Rehab or higher. The Linear Soils Report shall be included as supplemental data in the bid documents.

The milestone actual end date represents the date that the Linear Soil Survey Report has been completed and distributed to the Lead Designer or Technical Representative.

## **Slope Stability**

The Geotechnical Section of Materials and Research will provide stability evaluation of existing slopes, proposed slopes, and landslides. This activity covers backslopes, foreslopes, bridge end slopes, and landslide areas. The report will provide an analysis and recommend corrective measures or acceptable slopes to obtain or increase stability. The Slope Stability Report shall be included as supplemental data in the bid documents.

The milestone actual end date represents the date that he Slope Stability Report have been completed and distributed to the Lead Designer or Technical Representative.

## Bridge Soil Borings

The Geotechnical Section of Materials and Research Division or Consultant will provide bridge soil borings, analysis and design recommendations for bridge piling/foundation design, settlement, and slope stability problems which may affect bridge design and construction. The Deep Foundation Report shall be included as supplemental data in the bid documents.

The milestone actual end date represents the date that the Bridge Soil Borings have been submitted to the Bridge Designer or Technical Representative.

## **Guardrail Soil Borings**

The Geotechnical Section of Materials and Research Division or a Consultant will provide guardrail soil borings and soil analysis to be used by the Guardrail Designer for the foundation

#### GRDWY 563

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SS 566

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BSB

GRDSB

design of high-tension guardrails.

The milestone actual end date represents the date that the completed soil boring logs have been submitted to the Guardrail Designer.

## Bridge Design

Refer to Chapter IV-Section 01.01 of the Design Manual for additional information.

The Bridge Division or Consultant will provide bridge and box culvert design. A Preliminary Engineering meeting must be scheduled with the Bridge Engineer prior to beginning the preliminary design process. Persons in attendance shall include the Bridge Engineer, Assistant Bridge Engineer, Section Leader, Designer of the project, and others as appropriate.

The milestone actual end date represents the date final design calculations have been completed and final drafting of plans can begin.

## Load Rating

New, replaced, and rehabilitated bridges are to be load rated in accordance with the NDDOT Load Rating Manual as part of the design phase, except as noted below. The NDDOT Load Rating Engineer will review and load rate bridges to ensure they meet intended design and legal loads.

For Consultant led projects, a preliminary load rating shall be submitted to the NDDOT prior to the submittal of final plans. A preliminary load rating for precast box culverts will be completed as part of the Shop Drawing review process.

The milestone actual end date represents the date that the preliminary Load Rating has been completed and approved. This date will be entered by the NDDOT Load Rating Engineer upon approval.

## **Bridge Plan Preparation**

This work is identified in Section IV of the Design Manual.

The Bridge Division or consultant will provide bridge and box culvert plan preparation.

The milestone actual end date represents the date that the Bridge Plans are ready for PS&E.

## **HMA Mix Recommendations**

The Materials and Research Division will provide recommendations for HMA aggregate classification, compaction requirements and specifications, asphalt cement classification, and asphalt cement percentage.

The milestone actual end date represents the date that the HMA Mix Recommendation has been distributed to the Environmental Document Author or Technical Representative.

#### BRDES 610

BRR 615

BRGPP 620

HMA

#### Design Right Of Way Limits

## ROWL 655

RWABS

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The Lead Designer or Consultant will provide the permanent and temporary right of way limits and construction easements for the purpose of obtaining of title commitments, surface ownership reports, and preparation of right of way plats. Lead Designers will submit to their assigned representative from Right of Way Services in ETS Division, and submit to the Right of Way Plats Section Team Leader in Design Division. Consultants will submit to the Technical Representative.

The following information shall be submitted for Design Right of Way Limits:

Map showing temporary construction easements and permanent right of way needs with approximate dimensions, and color or hatching to distinguish which needs are permanent and which are temporary.

Legal Description to the quarter-quarter section (e.g., NW4-NW4 of Sec.2) and shall include the County, Section, Township, and Range.

If the property is located in a platted subdivision include the: Lot, Block, Subdivision, and City and/or County (e.g., Lot 1, Block 2, Sundown Acres, Mandan)

The subject of the email or request shall include the Project Number, PCN, and text "Request for Title Information"

The milestone actual end date represents the date that the Design Right of Way Limits are transmitted to Right of Way Services or to the Technical Representative.

## Abstracts/Title Information

This work is identified in the Right of Way Manual. ETS Division – Right of Way Services or the Consultant will order and obtain title commitments from the title insurance company upon receipt of the permanent and temporary right of way limits from the Lead Designer. Surface Ownership Reports will be obtained on temporary parcels where permanent right of way is not needed.

The milestone actual end date represents the date that the last Abstract/Title is received by the Right of Way Section or Consultant.

## Right of Way Plats Preliminary to ETS PLETS

This work is identified in Section VIII of the Right of Way Manual.

The Right of Way Plats Section, or the Consultant will prepare the right of way plats and legal descriptions of the right of way parcels. For consultant projects, the Consultant will submit the plats and legal descriptions to the Technical Representative who will forward to the Right of Plats Section for review and approval. When the Right Way Plats Section has approved, they will submit the completed plats to the ETS Division. ETS may need revisions as their process proceeds.

The actual end date will be updated after each revision and the previous submittal dates will be tracked in the comments section of this activity. The milestone actual end date shall be entered by the Right of Way Plats Section and represents the date the most recent version of the right of way plats have been submitted to ETS Division.

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## Right of Way Cost

ETS Division Right of Way Services Staff Appraiser will create a preliminary right of way cost. The preliminary cost estimate is obtained by establishing an estimated acquisition value that is added to the estimated cost to acquire the property. These cost estimates include administrative costs of negotiation and acquisition, title fees, appraisal fees, administrative settlements, court fees, relocation, and any other foreseen cost to acquire all the right of way for the project. These values are summed and submitted as the preliminary cost estimate to FHWA for Right of Way Authorization approval.

The milestone actual end date is the date authorization is requested and will be entered by the Right of Way Staff Appraiser that submits for right of way authorization.

## **Right of Way Authorization**

Upon completion of a right of way cost estimate by ETS Division – Right of Way Services, or its consultant, Right of Way Services will obtain authorization from FHWA to commence with appraisals, acquisition of right of way, and relocation assistance if necessary.

The milestone actual end date represents the date that authorization has been obtained from FHWA.

## Appraisal

ETS Division – Right of Way Services will provide preliminary cost estimates for all permanent and temporary right of way parcels. The right of way plats and preliminary parcel cost estimates are submitted to the FHWA as part of the request for right of way authorization to appraise and negotiate. Right of Way Services, or Consultant, will then commence with the appraisals of the right of way parcels. All consultant prepared appraisals shall be completed by a qualified fee appraiser and need to be reviewed by Right of Way Services, Review Appraiser.

No appraisals are required If: 1) The property owner agrees to donate and waives their right to an appraisal; or 2) the property owner accepts the State's minimum payment for all temporary easement parcels and for all permanent right of way parcels and waives their right to an appraisal; or 3) The appraisal problem is determined to be uncomplicated and complies with the NDDOT's criteria for acquisition via Waiver Valuation.

The milestone actual end date represents the date that the last appraisal has been accepted.

## **Borrow Quantities To R/W**

For internal projects, the Lead Designer will email the estimated borrow quantity to the Right of Way Program Manager in Environmental and Transportation Services (ETS). For external projects, the Consultant will email the estimated borrow quantity to Technical Representative for review.

The milestone actual end date represents the date that the Borrow quantities have been submitted to the Right of Way Program Manager in ETS for internal projects or the date the borrow quantities have been delivered to the Technical Representative for consultant projects.

## RWAPP 715

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The Lead Designer or Technical Representative will enter the actual completion date in RIMS.

## Borrow

## RWBOR 745

ETS Division – Right of Way Services or Consultant will acquire borrow options for additional borrow material needed for the project, utilizing the NDDOT borrow option agreement form.

Borrow Site Naming Convention: The first optioned site within a project will be designated, "B-1". Subsequent sites will be similarly designated in sequential order, i.e., B-2, B-3, B-4, B-5, etc. Sites will not to be designated with the same number, even if the number is preceded by a name. For example, do not designate sites as "Smith B-1" and "Jones B-1".

Sites will not be optioned for multiple projects.

For each optioned site, the NDDOT Negotiator, or the Consultant Negotiator through the Technical Representative, will:

E-mail the estimate of the NDDOT's borrow cost share to the Lead Designer or Technical Representative.

Submit Material Source Request form to Environmental & Transportation Services.

Submit option agreement to ETS Right of Way Program Manager through the Technical Representative for approval and processing of option fee.

The Right of Way Agent or Consultant will assemble a balance spreadsheet that tracks the quantity of borrow needed, the amount optioned, the amount provided with a clue, and the remained as contractor furnished. Once the balance sheet is complete, the Right of Way Agent or Consultant through the Technical Representative will notify the Right of Way Program Manager via e-mail when the balance sheet is complete. This notification will list all borrow sites that have been optioned for the project, any clues, and any remaining need as contractor furnished borrow. The optioned sites will include the borrow site number, date optioned, name of optionee, site acreage, section-township-range, county, and option quantity (cubic yards). The final balance spreadsheet will also be distributed to the Lead Designer or Technical Representative, and Materials and Research Division.

The milestone actual end date represents the date that the balance spreadsheet for borrow and COA is complete.

## **Borrow Investigation**

This work is identified as follows: Once the ETS Division issues a Material Source Certificate of Approval (COA) for the Optioned area(s), the geotechnical investigation will be completed by eh Geotechnical Section for the Materials and Research Division or Consultant. The investigation will include conducting soil borings in order to obtain and analyze samples. A Borrow Area Report detailing what was found and if it is suitable for the intended use will be generated from the data obtained. The Borrow Area Report shall be included as supplemental data in the bid documents.

The milestone actual end date represents the date that the Borrow Area Report has been approved and distributed to the Lead Designer or Technical Representative.

## BORIN 746

#### Section 401 WQC Pre-Application 401PA

401PA 748

WETIE

The information required for a 401 WQC Pre-Application can be found on the Reference and Forms page of the NDDOT website.

Lead Designer, or Consultant through the Technical Representative, shall submit preapplication information to ETS Division –Environmental Services Section by the projected end date.

Upon receipt of the information, Environmental Services will proceed with EPA notification of the need for 401 WQC. This information is required 30 days before a 401 WQC Application can be submitted and accepted by the EPA.

The milestone actual end date represents the date that complete 401 WQC Pre-Application information has been submitted to ETS Division – Environmental Services.

#### Section 404 and Wetland Information

The information and forms required can be found on the Reference and Forms page of the NDDOT website. The information will satisfy a typical Nationwide or 404 Permit Application. See the Design Manual Chapter II - Section 4 for more information.

This activity requires the Lead Designer, or Consultant through the Technical Representative, to submit final wetland information and any applicable Section 404 Permit application to ETS Division – Environmental Services Section by the projected end date.

The milestone actual end date represents the date that Environmental Services receives the final wetland impact information with any revisions completed.

## Section 404 Agency Mitigation Site Review WETMP 750

This activity is required for onsite mitigation areas requiring an agency site visit to verify that the site is an acceptable compensatory mitigation location. Site visits are for onsite mitigation areas not located within a typical ditch section or are requested by an agency. ETS Division – Environmental Services Section will coordinate with the appropriate agencies to determine if a site visit is warranted and will also work with Design to determine the appropriate documents needed. Coordination of the site visit will be conducted by ETS Division – Environmental Services Section prior to final design.

The milestone actual end date represents the date that a site visit was conducted or determined not required and is entered in by ETS Division – Environmental Services Section.

#### Section 401 WQC Application

401A 751

The information required for a 401 WQC Pre-Application can be found on the Reference and Forms page of the NDDOT website.

The Lead Designer shall submit the final wetland impact information to ETS Division – Environmental Services Section by the projected end date. Upon receipt of the information,
Environmental Services will proceed with the 401 WQC.

The milestone actual end date represents the date that final, complete 401 WQC Application information has been submitted to ETS Division – Environmental Services.

#### Section 404 Permit

See the Design Manual Chapter II - Section 4 for more information.

Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers (USACE) to issue permits for the discharge of dredged or fill material into Waters of the United States (WOTUS), including wetlands. WOTUS are identified in the Jurisdictional Determination. If any construction activity includes placing fill within WOTUS, a Section 404 Permit is required. If impacts do not meet the Nationwide Permit thresholds an Individual Permit would be needed.

The milestone actual end date represents the date that the Section 404 permit is signed by the USACE and is entered in by the ETS Division - Environmental Services Section.

#### Cost Estimate to Local Govt.

The Lead Designer or Consultant on a project will provide an up-to-date cost estimate to Local Government Division (LGD) for all projects located within the Metropolitan Planning Area (MPA) for any of the Metropolitan Planning Organizations (MPOs) in North Dakota. LGD will use this cost estimate to compare the current information with the MPO's Transportation Improvement Program (TIP) to determine if any changes are required prior to funding authorization.

The milestone actual end date is the date LGD receives the information from the Lead Designer or Consultant.

#### Section 401 WQC

Per the Clean Water Act (CWA) Section 401 Water Quality Certification (WQC), any applicant for a federal license or permit for an activity that may result in any discharge into waters of the United States must obtain a certification from the certifying agency specifying that the activity will comply with all applicable CWA requirements, unless a waiver has occurred. For typical NDDOT projects, 401 WQC will need to be obtained separately by the NDDOT when USACE jurisdictional waters are impacted on a Reservation, or an individual permit is required.

The projected end date is 2 weeks prior to plan complete date. The milestone actual end date represents the date that the 401 WQC is signed and is entered in by the Environmental Section.

#### Section 408 Permission Request

This activity requires that the Section 408 Permission Request Information be submitted to the ETS section after a Section 408 coordination meeting is held between the USACE and NDDOT. The meeting will identify the information needed for the application and determine the approximate turnaround time which will be reflected in the projected milestone end date.

The milestone actual end date represents the date that Environmental Services receives the

#### CE404 752

401P 754

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CELG 753

final, complete Section 408 Permission Request information and is entered in by the Lead Designer or Technical Representative.

## Section 408 Permission

Pursuant to 33 USC 408 (Section 408) Section 408 permission is needed from the USACE Secretary of the Army to make alteration to, or temporarily or permanently occupy or use, any USACE Corps of Engineers (USACE) federally authorized Civil Works Project, referred to as USACE Project. A USACE Project can consist of USACE owned lands, USACE flowage easements, USACE managed levees, USACE channel realignments, etc. If any construction activity impacts a USACE Project, temporarily or permanently, Section 408 Permission will be needed, and this activity should be added.

The milestone actual end date represents the date that the Section 408 Permission is signed by the USACE and is entered in by the ETS Division - Environmental Services Section.

## **USACE** Outgrant

A USACE Outgrant is required for additional permanent easements on USACE property. This is for all non-recreational real estate outgrant requests for use of lands and waters operated and maintained by the Corps. It takes upwards of 1 year to go through and to complete the outgrant.

The milestone actual end date represents the date that the outgrant has been approved by USACE and signed. It is the Environmental Services Section's responsibility to ensure the milestone date is met.

## Floodway Authorization Request

The information required for a Floodway Authorization Request can be found on the Reference and Forms page on the NDDOT website. See the Design Manual Chapter II - Section 4 for more information.

This activity requires that the Lead Designer, or Consultant through the Technical Representative, submit a completed Floodway Authorization Information Checklist including all required information to ETS Division - Environmental Services Section by the projected end date. Upon receipt of the information, Environmental Services will proceed with the Floodplain Permit application.

The milestone actual end date represents the date that final, complete Floodway Permit information has been submitted to ETS Division – Environmental Services.

## **Floodway Authorization**

Per Century Code 61-16.2 and Title 44 Code of Federal Regulations Part 59, work within a regulatory floodway may require authorization from the ND Department of Water Resources prior to applying for a Floodplain Permit. The solicitation of views response from the ND

The milestone actual end date represents the date that the Floodway Authorization is signed

Department of Water Resources will identify if there is a floodway within the project area.

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and is entered in by the Environmental Section.

#### Flood Plain Permit Application

PERA3 761

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The Floodplain Permit Application Checklist can be found on the Reference and Forms page on the NDDOT website. See the Design Manual Chapter II - Section 4 for more information.

This activity requires that the Lead Designer, or Consultant through the Technical Representative, submit a completed Floodplain Permit Application Checklist including all required information to ETS Division – Environmental Services Section by the projected end date. Upon receipt of the information, Environmental Services will proceed with the Floodplain Permit application.

The milestone actual end date represents the date that complete Floodplain Permit information has been submitted to ETS Division – Environmental Services.

#### Flood Plain Permit

Per Century Code 61-16.2 and Title 44 Code of Federal Regulations Part 59, work within a regulatory floodplain may require a Floodplain Permit to be obtained from the local City, County, Township, or Reservation floodplain administrator. The solicitation of views response from the ND Department of Water Resources – Office of the ND Department of Water Resources will identify if there is a floodplain within the project area, the floodplain administrator contact information, and the Flood Insurance Rate Map (FIRM) or panel number which identifies the floodplain location. Additional Floodplain information can be found on the ND Department of Water Resources & Office of the ND Department of Water Resources website and on the Federal Emergency Management Agency's website.

The average turnaround time to obtain a Floodplain Permit is typically one month after the application submittal.

The milestone actual end date represents the date that the Floodplain Permit is signed and is entered in by the Environmental Section.

#### **Construction Permit Application**

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The Construction Permit Application Checklist can be found on the Reference and Forms page on the NDDOT website. See the Design Manual Chapter II - Section 4 for more information.

This activity requires that the Lead Designer, or Consultant through the Technical Representative, submit a completed Construction Permit Application Checklist including all required information to ETS Division – Environmental Services Section by the projected end date. The solicitation of views response from the ND Department of Water Resources Department of Water Resources should identify the need for a Construction Permit.

The milestone actual end date represents the date that Environmental Services receives the final, complete Construction Permit information.

#### **Construction Permit**

See the Design Manual Chapter II - Section 4 for more information. Additional information can be found on the ND Department of Water Resources website.

Century Code 61-03, 61-04, and 61-16.1 authorizes the Office of the ND Department of Water Resources to regulate the construction and modification of dams, dikes, and other devices. The solicitation of views response from the ND Department of Water Resources will identify if the proposed activity requires a Construction Permit.

The milestone actual end date represents the date that the Construction Permit is signed by the ND Department of Water Resources and is entered in by the ETS Division - Environmental Services Section.

#### **Sovereign Lands Permit Application** SOVL1

See the Design Manual Chapter II - Section 4 for more information. The Sovereign Lands Permit Application Information Checklist can be found on the Reference and Forms page on the NDDOT website.

This activity requires that the Lead Designer, or Consultant through the Technical Representative, submit a completed Sovereign Lands Permit Application Information Checklist including all required information to ETS Division – Environmental Services Section by the projected end date.

The milestone actual end date represents the date that Environmental Services receives the final, complete Sovereign Lands Permit Information Checklist including all required information.

#### **Sovereign Lands Permit**

See the Design Manual Chapter II - Section 4 for more information. The list of waters considered Sovereign Lands and additional information can be founded on the ND Department of Water Resources website.

Century Code 61-33 and Administrative Code Article 89-10 states a Sovereign Lands Permit is needed when a portion of a transportation project lies partially or wholly below the ordinary highwater mark of navigable lakes and streams and is managed by the ND Department of Water Resources. The solicitation of views response from the ND Department of Water Resources will identify if there are Sovereign Lands within the project area.

The milestone actual end date represents the date that the Sovereign Lands Permit is signed by the ND Department of Water Resources and is entered in by the ETS Division - Environmental Services Section.

#### **Special Use Permit Application**

SUPA 769

The Special Use Permit Application Information Checklist can be found on the Reference and Forms page on the NDDOT website.

This activity requires that the Lead Designer, or Consultant through the Technical Representative, submit a completed Special Use Permit Application Information Checklist

#### CEDMD 766

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including all required information to ETS Division – Environmental Services Section by the projected end date.

The milestone actual end date represents the date that final, complete Special Use Permit Application information has been submitted to ETS Division – Environmental Services.

#### Special Use Permit

A Special Use Permit is required for temporary impacts on a US Fish and Wildlife Service property interests which typically occur outside of the road right of way. This permit is also used when there are permanent impacts to US Fish and Wildlife Service property requiring mitigation to allow the project to proceed while a USFWS easement exchange is being processed and will not be completed two weeks prior to the plan complete date.

The milestone actual end date represents the date that the Special User Permit is signed and is entered in by the Environmental Section.

#### **USFWS Easement Exchange**

A wetland easement is a legal agreement through which the US Fish and Wildlife Service pays a landowner to permanently protect wetlands. Similarly, a grassland easement is a legal agreement through which the USFWS pays a landowner to permanently keep land in grass. If a project impacts either a wetland or grassland easement, the Department will need to replace easements that will be released with lands of similar or greater biological and financial value. This is considered an easement exchange.

The milestone actual end date represents the date that the easement exchange has been approved by USFWS.

#### Mitigation Site Plan

This activity requires that the Mitigation Site Plan be submitted to the North Dakota Interagency Review Team (NDIRT) and approved. The Mitigation Site Plan is the document that summarizes the mitigation bank and addends it to our umbrella mitigation document and contains the performance standards and guidelines set forth in the 2008 banking rule. The milestone actual end date represents the date that the Mitigation Site Plan is approved by NDIRT and addended to the NDDOT Umbrella Mitigation Banking Instrument.

## Railroad Requirements

A Railroad Coordinator shall review the project scope of work, information submitted within the form, and respond to the Technical Representative or Lead Designer with the applicable railway requirements or if the project can be exempted from further coordination.

The Railroad Coordination Team will coordinate with the respective railroad(s) to complete any necessary permits and agreement(s) to facilitate rehabilitation or replacement of grade separations and roadway improvements within railroad right of way.

The provisions of any permits and agreements will be appended by reference in the Railroad

#### SUPER 770

#### FWSEE 772

#### MSP 778

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Requirements Special Provision and incorporated into the contract proposal.

The milestone actual end date represents the date that permits and agreements have been signed and executed.

#### Guardrail\*

Used for NDDOT internal projects when guardrails are completed by a consultant.

#### **CLOMR** Application\*

This activity requires that the NDDOT Lead Project Designer, or Consultant through the NDDOT Technical Support Contact, submit a completed Conditional Letter of Map Revision (CLOMR) Application including all required information to ETS Division – Environmental Services Section by the projected end date. The CLOMR application may take up to 1 year to process by FEMA.

The milestone actual end date represents the date that Environmental Services receives the information with any revisions completed and is entered in by the project designer or consultant technical support. It is the lead designer's responsibility to ensure the milestone date is met.

A Conditional Letter of Map Revision (CLOMR) is FEMA's comment on a proposed project that would affect the hydrologic and/or hydraulic characteristics of a flooding source and thus result in the modification of the existing regulatory floodway or effective Base Flood Elevations (BFE), or the Special Flood Hazard Area (SFHA). The letter does not revise an effective NFIP map, it indicates whether the project, if built as proposed, would be recognized by FEMA.

The milestone actual end date represents the date that the CLOMR is received by the NDDOT.

## LOMR\*

CLOMR\*

Once a project where a CLOMR was required has been completed, the community must request a revision to the Flood Insurance Rate Map (FIRM) to reflect the project. "As-built" certification and other data must be submitted to support the revision request. A Letter of Map Revision (LOMR) is then issued by FEMA. The LOMR is a letter from FEMA officially revising the current NFIP map to show changes to floodplains, regulatory floodways, or flood elevations.

The milestone actual end date represents the date that the LOMR is received by the NDDOT.

## **Coast Guard Permit Application**

See the Design Manual Chapter II - Section 4 for more information.

This activity requires that the Lead Designer, or Consultant through the Technical Representative, submit a completed Section 9 Coast Guard Permit information (Lead Designer) or Application (consultants) to ETS Division - Environmental Services Section by the projected end date.

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The milestone actual end date represents the date that a final, complete Section 9 Coast Guard Permit Application has been submitted to Environmental Services Section and is entered in by the Lead Designer or Technical Representative.

#### **Coast Guard Permit**

See the Design Manual Chapter II - Section 4 for more information and the US Coast Guard website for additional information.

Section 9 of the Rivers and Harbors Act of 1899 and the General Bridge act of 1946 preserve the public right of navigation and prevent interference with interstate and foreign commerce. These acts place navigable water of the US under control of the US Coast Guard. A Section 9 Coast Guard Permit is needed for any plans to construct or modify a bridge or causeway across a navigable waterway of the United States. This includes temporary bridges used for construction access or traffic detour.

The milestone actual end date represents the date that the Coast Guard Permit is signed and is entered in by the Environmental Section.

#### **Presidential Permit\***

Under Executive Order 13867 of April 10, 2019, the Secretary of State has been designated to receive all applications for the issuance or amendment of Presidential permits for the construction, connection, operation, or maintenance, at the international boundaries of the United States of certain cross-border projects. Any decision to issue, deny, or amend a permit is made solely by the President of the United States.

The Bureau of Western Hemisphere Affairs has been designated by the Secretary of State to receive Presidential permit applications for most facilities at the Canadian and Mexican borders, except:

Liquid petroleum and petroleum product pipelines, which go to the Department of State's Bureau of Energy Resources.

Electrical transmission lines, which go to the Department of Energy.

Natural gas pipelines, which go to the Federal Energy Regulatory Commission.

Submarine cables, which go to the Federal Communications Commission.

The milestone actual end date represents the date the NDDOT receive the permit.

## Value Engineering

## VAENG 817

The Value Engineering (VE) program is discussed in the Value Engineering Manual, which can be found on the NDDOT website.

Section V of the manual, "Project Tracking" discusses the types of projects that have a need or a high likelihood of needing VE. The Lead Designer or Technical Representative must notify the Technical Services Section – ETS Division if the triggering events from Section "Project Tracking" are in place for a particular project. Technical Services Section will coordinate a VE study, either independently or in coordination with the project consultant. This should be discussed as soon as the project tracking is triggered.

PPR

The milestone actual end date represents the date that the Deputy Director for Engineering approves or rejects all VE recommendations in the VE report.

#### **Preliminary Plan Review**

Preliminary plan reviews are conducted to discuss critical design elements that need to be determined early in the plan development process. Typical items include the typical proposed sections, alignments, profiles, cross sections, 3D models, construction phasing, and other critical items. The preliminary plan review should occur about one year prior to the PSE, or around the time right of way limits are determined.

The milestone actual end date represents the date the Preliminary Plan Review is conducted.

#### Plans In Hand Field Inspection

The Lead Designer will conduct PS&E Plan Review and complete necessary plan revisions. This task is explained in detail in Section I-10 of the Design Manual.

The milestone actual end date represents the date that the PS&E is conducted.

#### ITS Systems Engineering Checklist ITSCL 821

Lead Designer or Technical Representative shall complete and submit the ITS Systems Engineering Checklist SFN 60212 to show their ITS project or ITS elements within a project were developed using a systems engineering approach. Supporting documentation can be found at Intelligent Transportation Systems (ITS) | NDDOT

The milestone actual end date represents the date that the ITS Engineer has received the ITS Checklist from the Lead Designer or Technical Representative.

#### Plan Delivery for Final Review

This activity is when the Consultant, District, Bridge Division, Materials & Research, or Traffic Section working on NDDOT plans submits the completed set of plans, or respective portion of the plans to the Lead Designer or Technical Representative for the project. The final plan checklist is complete, and the final bid package is submitted and ready for a final review by the NDDOT. Time should be allotted between the submittal of the final bid package and the bid ready date for a final review and time for revisions prior to the bid ready date.

The milestone actual end date represents the date that the completed set of plans is submitted to the Lead Design or Technical Representative.

#### Plan Completion Date

The Lead Designer or Technical Representative will submit the original plan sheets and cost estimate to the Programming Division - Programming Section, on or before this date. Any changes to the original plans after this submittal must be coordinated with the Programming

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Section, or as provided in Section I-11 of the Design Manual.

The milestone actual end date represents the date that the Plans have been turned into the Programming Division – Programming Section.

## **Right of Way Plats Final**

The final approved Right of Way plats are stamped, signed and submitted to ETS for recording, after the certification of right of way negotiations.

The milestone actual end date represents the date the Right of Way plats are stamped, signed and submitted to ETS.

## **Utility Conflict Plans**

The desired schedule date is 4 months before project completion. It is the Departments policy to notify Utility Company of specific conflicts a minimum of 3 months before the bid opening date.

This work is identified in Section III-08 of the Design Manual and in the "Coordination and Notification for Utility Relocation, Adjustments, and Reimbursement Policies and Procedure" manual on the NDDOT website. These manuals refer to this activity as "Notification to Utility Company". The UCPL are a large part of the "Notification to Utility Company" and the terms are synonymous.

This milestone actual end date represents the date the Utility Coordinator or Consultant sends documentation notifying the Utility Company of its facilities that must be relocated or adjusted and which portions, if any, will be eligible for reimbursement. This milestone date also represents when all required utility agreements, if needed, have been sent to the utility companies.

The Actual Completion Date for this activity shall be recorded in milestone by the Utility Coordinator. The Utility Company is requested to proceed with the necessary field inspection, preparation of plans, and a cost estimate for the relocation work upon receipt of the UCPL.

## Mailboxes

ETS Division – Right of Way Services will process mailbox notices to the affected postmasters, informing them that the state will be replacing the existing mailbox support with a new crash tested support. Right of Way Services will inform the Lead Designer of the number of mailboxes that will be affected.

The milestone actual end date represents the date that the postmasters and Lead Designer have been notified.

## **TERO Agreement**

TERO 855

The Lead Designer or Technical Representative must provide Technical Services - ETS Division with the information listed in the Special Provisions section of the Design Manual (I-

#### UCPL 830

#### 850 RWMLB

# SECTION I-02 Page 45

PLFIN 829 10.03) for the TERO Agreement.

Technical Services will provide a TERO agreement for projects near or within the reservation boundaries for the roadways shown in Section I-10.03. Local Government projects also require TERO agreements, however these roads are not listed in the Design Manual. The requirements of the TERO agreement are incorporated into the project within a special provision. The Lead Designer should begin coordinating with Technical Services Section as soon as the scope of the project is known and continue coordination as the types of work included on the project become more defined, or if any work types change.

The milestone actual end date represents the date that the TERO agreement is completed.

#### Acquisition

RWACQ 865

ETS Division – Right of Way Services or Consultant, will commence with the negotiation and acquisition of the right of way after authorization to proceed from FHWA.

Negotiations shall be conducted, complete with documentation (negotiation worksheet, reports, offers, etc.) Any increases or deviations from approved appraisal value shall be justified and submitted to Right of Way Services for final acceptance. Any deviations from the approved appraisals will require advance approval of the Right of Way Section. If required, include cost estimates for hazardous material clean-up and disposal. The negotiated parcel files should be submitted to Right of Way Services as soon as the paperwork has been completed.

Right of Way Services shall be notified if any condemnation action will be necessary. Those parcel files to be condemned shall be submitted to Right of Way Services ten weeks prior to the bid opening.

#### **Right of Way Application To BIA**

The milestone end date represents the date the application has been sent and shall be 90 days prior to the Plans Due date.

#### **Project Completion**

This date represents the delivery date of project items to Programming Division such as plans, cost estimates, SPs, permits, certifications for R/W, railroad, and utilities, etc. and the project is ready to bid. The project complete date is synonymous with the bid ready date.

#### **Relocation Assistance**

All relocation assistance shall comply with 49 CFR Part 24 (Uniform Act) and FHWA's current edition of the Real Estate Acquisition Guide for Local Public Agencies, Publication FHWA PD 93 027. No lawful occupant shall be required to move unless they have received at least 90 days advanced written notice from the date the written appraisal offer was made. The 90 Day Relocation Notices will include expiration dates.

The milestone actual end date represents the date that anything that was required to be relocated has been relocated off the right of way.

RWBIA 867

869

RWREL 870

PC

872

#### **Right of Way Certification**

The Right of Way Section Program Manager is required to certify all acquisitions on Federal-aid projects that all right of way is acquired and available for the project. The lead Designer or Technical Representative will submit the right of way certification form to the Right of Way Section Program Manager. This written certification is signed no later than the project's bid ready date.

The actual end date represents the day certification is complete and will be entered by the Right of Way Section Program Manager.

#### **Railroad Certification**

Railroad certification means either there are no railroad requirements, or the railroad requirements have been completed. Railroad requirements include but are not limited to plan notes, special provisions, permits, agreements, and right of way. The Lead Designer or Technical Representative will submit the railroad certification form to the Right of Way Section Program Manager. This written certification is signed no later than the project's bid ready date.

The actual end date represents the day certification is complete and will be entered by the Right of Way Section Program Manager.

#### **Utilities Certification**

Certification letters regarding utility relocations and adjustments must be included with the submission of the original plan sheets. There are various types of letters depending on the type of project. It is the responsibility of the Utility Engineer to submit the appropriate letters to the Programming Section of the Programming Division. The certification letters must be submitted by the plan completion date.

The milestone actual end date represents the date that the Utility Certification Letter has been submitted.

#### **Right of Way Encroachments**

This work is identified in the NDDOT Maintenance Operations Manual. The District Engineers are responsible for the elimination of unauthorized encroachments and control of authorized encroachments within their districts. The districts will conduct a right of way encroachment survey and arrange for removal or permit of encroachments. At the recommendation of the District Engineer will request the necessary approval from FHWA for any permitted encroachments. The environmental document author will provide the district with exhibits detailing encroachments for review and recommendations. Encroachments will be included and discussed in the environmental document.

This milestone actual end date represents the completion survey and identification of encroachments. The agreements for removal or permit of encroachments must be obtained prior to certification of right of way.

# RWCER 871

RRCER

UCERT 873

874

RWENC

893

894

## **Right of Way Plats Recorded**

The final approved Right of Way Plats are recorded with the County Recorder.

The milestone actual end date represents the date the right of way plats have been recorded.

# **CPM Info to Local Govt**

The Lead Designer or Consultant will provide Local Government Division (LGD) with the PS&E cost estimate, project details and any unique maintenance items for preparation of the Cost Participation and Maintenance (CPM) agreement.

The milestone actual end date represents the date LGD receives the information from the Lead Designer or Consultant.

# **CPM Info to Programming**

The Lead Designer or Consultant will provide Programming with the PS&E cost estimate, project details and any unique maintenance items for preparation of the Cost Participation and Maintenance (CPM) agreement.

The milestone actual end date represents the date Programming receives the information from the Lead Designer or Consultant.

## **Cost Maintenance Agreement**

The Programming Division or Local Government Division will provide a Cost Maintenance Agreement with the Municipalities. The Bridge Division will provide a Cost Maintenance Agreement with the Railroad-on-railroad bridges. This agreement states the maintenance responsibilities and cost participation responsibilities of the municipality.

The milestone actual end date represents the date that the Agreement has been signed by all parties involved.

## PLREC 891

CPMLG

CPMPL

## CMAGR 895



Safety Review: Consultant Projects



## APPENDIX I-02 A Page 50

#### **Borrow Acquisition Process-Internal Projects**



## APPENDIX I-02 A Page 51

#### Borrow Acquisition Process-Consultant Projects



## APPENDIX I-02 A Page 52

**Traffic Operations Process-Internal Projects** 





(primary and secondary) projects.



#### I-03.01 FHWA/NDDOT Stewardship Agreement

The Federal-Aid Highway Program Stewardship and Oversight Agreement on Project Assumption and Program Oversight by and between North Dakota Department of Transportation and Federal Highway Administration North Dakota is available on the web at: http://mydot.nd.gov/manuals/StewardshipAgreementManualTag.pdf

The purpose of this agreement is to document the roles and responsibilities of FHWA and NDDOT in administering the Federal-Aid Highway Program. This agreement outlines responsibilities, clarifies actions, prevents misinterpretations, and avoids time delays.

#### I-03.02 FHWA Risk-Based Stewardship and Oversight (RBSO)

FHWA will provide oversight for risk-based stewardship and oversight (RBSO), of which these projects are mutually agreed upon with NDDOT. Final selection of RBSO projects will be identified in a FHWA/NDDOT letter. RBSO projects are assigned to a FHWA Transportation Engineer, typically according to their assigned risk areas. These projects will have a RBSO Plan outlining which project development items/phases require FHWA review and/or approval.

The degree of FHWA project review and inspection for project development activities of a RBSO project is established and outlined by the RBSO Plan for that particular project. The RBSO Plan may differ from project to project, and will contain the specific project items to receive FHWA oversight. However, there may be specific federal actions that are not listed within the project's RBSO Plan that still require FHWA oversight or approval.

FHWA will ensure NDDOT is provided a copy of the RBSO plan, as well as coordinate RBSO review. FHWA will contact Divisions and Districts that are responsible for the portions that are listed within the RBSO plan. Office Holders will notify each Division Director and/or District Engineer of projects selected as RBSO.

#### I-04.01 Purpose

Project Status Report (PSR) is an internal system that was developed to track the bid ready status of projects bid through the NDDOT. The purpose of PSR is to track and discuss the status of the development for upcoming projects, and ensure responsible divisions attend to any necessary items for upcoming project delivery. The focus of the PSR meeting is on projects that are flagged as critical, behind schedule, not scheduled to start, or not defined.

The PSR system can only be accessed by NDDOT employees using there NDDOT login at via the intranet at: <u>https://intranetapps.nd.gov/dot/prjstat/psr/login.htm</u>

#### I-04.02 PSR Reporting

Within PSR, there are multiple project development fields for each project that need to be reported. The Division user responsible for that particular field will need to select one of the following values for that item:

PROJECT STATUS KEY				
	Complete	100% Complete (bid ready)		
	Ahead of Schedule	Projected to be complete more than 1 month ahead of due date		
	On schedule	No schedule concerns		
	Not scheduled to start	Not ready to start (used for projects on hold)		
	Behind schedule	Delaying other tasks		
	Critical	Will likely not make bid opening		
	Not Defined	Currently Not Defined in System		

The following items are contained with PSR for every project, and the responsible divisions for reporting on that item are as follows:

Itom Description	Responsible Division	
Item Description	ND Highway System Projects	Off the ND Highway System
Env & Cultural Studies	ETS, Local Gov't	Local Gov't
Env Document Writing	Lead Division for the	Local Gov't
	Environmental Document	
Final Env Doc & Approval	ETS, Local Gov't	Local Gov't
Roadway Hydraulics	Bridge	Local Gov't
Structure Hydraulics	Bridge	Local Gov't
Structure Design	Bridge	Local Gov't
Roadway Design	Design or Local Gov't	Local Gov't
Traffic Safety	Design or Local Gov't	Local Gov't
Materials	Materials & Research	Local Gov't
Limits/Titles/Plats	Limits: Lead Division	Limits: Local Gov't
	Titles: ETS	Titles: Local Gov't
	Plats: Design	Plats: Local Gov't
Appraisal	ETS	Local Gov't
Acquisition	ETS	Local Gov't
Utility Engineering	Design or Local Gov't	Local Gov't
Permits	ETS	Local Gov't
Agreements	Local Gov't or Programming	Local Gov't

Comments are added to each of the above items to shortly justify the basis for the entered status for each value. If projects are critical or behind schedule, a plan on how to correct is discussed.

#### I-04.03 PSR Meetings

PSR meetings are typically held every two weeks. These meetings are organized and conducted by the Design Division. Members of the PSR meeting group include Design Division, Environmental Transportation Services, Bridge Division, Planning/Asset Management, Programming Division, Local Government Division, Materials & Research, Construction Services, Maintenance & Engineering Services, FHWA, Office of Project Development, Office of Operations, Deputy Director for Planning, and the Deputy Director for Engineering.

A PSR report is developed from projects that are programmed. All upcoming projects scheduled for the next 3 years are included on the PSR report for the meeting. The PSR group discusses each project on the PSR report that has any project development items in the Behind Schedule, Critical, Not Scheduled, or Not Defined status.

## I-05.01 General

The basic requirements for highway design are outlined in 23 CFR 625, "Design Standards for Highways" and 23 CFR 650 "Bridges, Structures, and Hydraulics." This regulation references a number of other documents and publications which are included in the Design Manual by reference. Following is a listing of specific publications that are utilized in highway and bridge design in North Dakota.

#### I-05.02 Reference Publications – Roadway and Bridge Design

- A Policy on Geometric Design of Highways and Streets. 7<sup>th</sup> edition. AASHTO, 2018 (referenced as A POLICY).
- > <u>A Policy on Design Standards Interstate System.</u> AASHTO, 2016.
- ▶ <u>Roadside Design Guide</u>. 4<sup>th</sup> edition. AASHTO, 2011 (July 2015 errata).
- Manual on Uniform Traffic Control Devices (MUTCD). 2009 edition, with revisions 1, 2, and 3, FHWA. <u>http://mutcd.fhwa.dot.gov/</u>
- Standard Highway Signs, English Version. 2004 edition with 2012 Supplement. FHWA. <u>http://mutcd.fhwa.dot.gov/ser-shs\_millennium\_eng.htm</u>
- > <u>Highway Capacity Manual.</u> 7<sup>th</sup> edition. Transportation Research Board, 2022.
- Traffic Control Devices Handbook. 2<sup>nd</sup> edition. Institute of Transportation Engineers, 2013.
- > <u>Traffic Engineering Handbook.</u> 7<sup>th</sup> edition. Institute of Transportation Engineers, 2016.
- > Access Management Manual. 2<sup>nd</sup> edition. Transportation Research Board, 2014.
- Standard Specifications for Structural Supports for Highway Signs, Luminaires, and <u>Traffic Signals</u>. 6<sup>th</sup> edition. AASHTO, 2013.
- Roadway Lighting Design Guide. 7<sup>th</sup> edition. AASHTO, October 2018.
- > <u>National Electric Code.</u> Current Edition.
- > Roadway Lighting, Publication RP-8-00, Illumination Engineers Society (IES), 2005.
- A Guide to Standardized Highway Barrier Hardware. 2nd edition. AASHTO, 1995. <u>http://www.aashtotf13.org/Barrier-Hardware.asp</u>
- Standard Specifications for Road and Bridge Construction. Current edition. NDDOT. <u>http://www.dot.nd.gov/dotnet/supplspecs/standardspecs.aspx</u>
- "NDDOT Design Manual." Current Edition. NDDOT. <u>http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm</u>
- "NDDOT CADD Standards Manual." Current Edition. NDDOT. <u>http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm</u>

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- "NDDOT Standard Drawings." Current Edition. NDDOT. <u>http://www.dot.nd.gov/dotnet2/view/stddrawings.aspx</u>
- "NDDOT Right of Way Manual." Current Edition. NDDOT. <u>http://www.dot.nd.gov/manuals/manuals-publications.htm</u>
- "NDDOT Local Government Manual." Current Edition. NDDOT. http://www.dot.nd.gov/manuals/manuals-publications.htm
  - "NDDOT Surveys and Photogrammetry Manual" Current Edition. NDDOT. http://www.dot.nd.gov/manuals/manuals-publications.htm
  - Sign Calculator Program" Current Version. NDDOT. https://www.dot.nd.gov/manuals/design/signcalculator/signcalculator.htm
  - \* "A Policy for Accommodation of Utilities on State Highway Right-of-Way." Mar. 2020. NDDOT. <u>http://www.dot.nd.gov/manuals/manuals-publications.htm</u>
  - Solution Contemporary Contempor
  - AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities. 2<sup>nd</sup> edition. AASHTO, 2021.
  - Proposed Guidelines for Pedestrian Facilities in the Public Rights-of-Way. 2011. United States Access Board, and 2013 SNPRM (Supplemental Notice of Proposed Rulemaking) on shared use paths.
  - "Designing Sidewalks and Trails for Access, Part I of II: Review of Existing Guidelines for Access." 1999. Federal Highway Administration. <u>http://www.fhwa.dot.gov/environment/sidewalks/</u>
  - "Designing Sidewalks and Trails for Access, Part II of II: Best Practices Design Guide." 2001. Federal Highway Administration. <u>http://www.fhwa.dot.gov/environment/sidewalk2/</u>
  - "Utility Relocation and Accommodation of Federal-Aid Highway Projects." Jan. 2003. Federal Highway Administration. <u>http://www.fhwa.dot.gov/reports/utilguid/</u>
  - Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects (FP-03, U.S. Customary Units). Federal Highway Administration, 2003. http://www.wfl.fhwa.dot.gov/design/specs/fp03.htm
  - Solution Structures and 1998 Supplement. AASHTO, 1998.

## I-05.03 Reference Publications – Structural Design

- > AASHTO LRFD Bridge Design Specifications. 9<sup>th</sup> edition. AASHTO, 2020.
- > AASHTO LRFD Bridge Construction Specifications. 4<sup>th</sup> edition. AASHTO, 2017.
- <u>Standard Specifications for Highway Bridges</u>. 17th ed. AASHTO, 2002. (for Rehabilitation only)

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- Highway Structures Design Handbook. Vols. I and II. American Institute of Steel Construction.
- ➢ "Box Culvert Program." NDDOT.
- > "NDDOT Load Rating Manual." Current Edition. NDDOT.

https://www.dot.nd.gov/manuals/bridge/NDDOT-LoadRatingManual.pdf

## I-05.04 Reference Publications – Other

- A. Code of Federal Regulations (CFR). The CFR is a codification of the general and permanent rules published in the Federal Register by agencies of the Federal Government. The code is divided into 50 titles representing broad areas of Federal regulations. Title 23 CFR, Highways, is the volume representing those current regulations applicable to the Federal Highway Administration and the Federal Lands Highway Program. The following are the parts of 23 CFR that are most relevant to the development and design of highways:
  - > Part 620, Subpart A. Highway Improvements in the Vicinity of Airports.
  - > Part 625. Design Standards for Highways.
  - > Part 630. Preconstruction Procedures.
  - > Part 650. Bridges, Structures, and Hydraulics.
  - Part 650, Subpart B. Erosion and Sediment Control on Highway Construction Projects
  - > Part 652. Pedestrian and Bicycle Accommodations and Projects.
  - > Part 655. Traffic Operations.
  - > Part 752. Landscape and Roadside Development.
  - > Part 771. Environmental Impact and Related Procedures.
  - Part 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise.

NOTE: CFR's can be viewed online at the following link: http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm

B. Federal Lands Highway Manual (FLHM). The manual is a one-volume book of documents developed by the Federal Lands Highway Office to consolidate all basic policies, directives, standards and guides pertaining to the Federal Lands Highway operations. Link to FLHM Project Development and Design Manual: http://www.wfl.fhwa.dot.gov/design/manual/

All of the above publications are readily available to persons performing design work for the department. In addition, there are many other AASHTO and FHWA publications and periodicals that are received and distributed to the various design entities.

## SECTION I-06\_\_\_\_ Design Guidelines, Investment Strategy, and Design Exceptions Page 62 Revised 10/24/2022

#### I-06.01 Design Philosophy

The basic philosophy to consider when designing new or existing roadway facilities is to do so in accordance with AASHTO <u>A Policy on Geometric Design of Highways and Streets</u>; hereinafter referred to as *A POLICY*. In using *A POLICY*, generally start with the minimum values provided and then adjust them as the need would dictate. There may be circumstances where it may be in the best interest to use the minimum or desirable values. There may be circumstances, it would be necessary to develop different values and process a design exception. Design exceptions are defined in more detail in Section I-06.04 of the Design Manual.

The philosophy to consider when applying *A POLICY* design values is to do so in accordance with NDDOT <u>DESIGN GUIDELINES for Preventive Maintenance</u>, <u>Minor Rehabilitation</u>, <u>Structural Improvement</u>, <u>Major Rehabilitation</u>, and <u>New/Reconstruction Projects</u>, March 2007; hereinafter referred to as *DESIGN GUIDELINES*. The *DESIGN GUIDELINES* are FHWA approved and recognized as of March 19, 2007. The *DESIGN GUIDELINES* have been referenced in the Design Manual in Section I-06.03 of the Design Manual.

The Director may designate and post special areas of state highways where lower speeds are required by condition. The design speeds for those segments are to be determined during the Project Development process.

Safety measures and issues will be identified and addressed as part of the Statewide Safety Program. The Statewide Safety programs will consist of four different types of analysis: Critical Rate Analysis, High Crash Analysis, Project Level Analysis, and Strategic Highway Safety Plan. Safety measures will be implemented with a safety project that will be scheduled and included in the Statewide Transportation Improvement Program (STIP), or if cost effective to be included with other projects. The Statewide Safety Program is defined in more detail in Section I-06.05 of the Design Manual.

## SECTION I-06\_\_\_\_ Design Guidelines, Investment Strategy, and Design Exceptions Page 63 Revised 10/24/2022

#### I-06.02 Investment Strategies

The North Dakota Department of Transportation, NDDOT, in conjunction with the Federal Highway Administration, FHWA, has developed a series of investment strategies outlined in the *DESIGN GUIDELINES* that will ensure the life expectancy of the roadway is met. These investment strategies are Preventive Maintenance, Minor Rehabilitation, Structural Improvement, Major Rehabilitation, and New/Reconstruction Projects. Below is a brief summary of each investment strategy:

**Preventive Maintenance –** The intended purpose of this strategy is to protect the pavement structure, slow the rate of pavement deterioration, and/or correct deficiencies in the pavement surface. The surface defects may be caused by the environment, and by daily wear and tear of traffic. This type of project may occur on the same roadway as frequently as supported by a cost effectiveness determination. A detailed definition of Preventive Maintenance can be found in Section I-06.03.01, which also includes examples of projects that can be considered Preventive Maintenance. An overlay is considered to be Preventive Maintenance when the maximum thickness is two inches (no allowance for rut filling).

**Minor Rehabilitation** – This strategy aims to correct the structural integrity of the pavement without necessarily changing the existing alignment and profile geometrics. A detailed definition of Minor Rehabilitation can be found in Section I-06.03.02, which also includes examples of projects that can be considered Minor Rehabilitation. When an overlay is between two and three inches the project is considered to be Minor Rehabilitation.

**Structural Improvement** – A Structural Improvement restores the structural integrity of the pavement without necessarily changing the existing alignment and profile geometrics. In addition, the load carrying capacity should be increased to meet the HPCS guidelines. A detailed definition of Structural Improvement can be found in Section I-06.03.03. A Structural Improvement is a surfacing/base material recommendation based upon an engineering analysis.

**Major Rehabilitation** – Major Rehabilitation requires a large amount of work to bring the condition of the highway up to a level that will extend the service life. This strategy also provides the opportunity to perform operational improvements. A detailed definition of Major Rehabilitation can be found in Section I-06.03.04, which also includes examples of projects that can be considered Major Rehabilitation.

**New/Reconstruction** – There may be extensive changes to the existing route such as relocating on a new alignment, or completely removing the roadway down to the subgrade and rebuild from the bottom up. Everything from ADA requirements to signing must be addressed when performing a new or reconstruction project. A detailed definition of New/Reconstruction can be found in Section I-06.03.05.

## SECTION I-06\_\_\_\_ Design Guidelines, Investment Strategy, and Design Exceptions Page 64 Revised 10/24/2022

#### I-06.03 Design Guidelines

These guidelines apply to linear rural roadway corridor projects.

The intent of the roadway width guidelines is not to reduce the roadway width to the minimum width shown in the guidelines, but rather to maintain or enhance based upon corridor needs. Select the appropriate strategy for the desired width.

- 1. If a District Corridor is on the NHS system the roadway will be designed to meet the minimum design guidelines for a State Corridor.
- 2. Design features that do not meet the minimum design guidelines but are incorporated into a project will require a design exception or appropriate documentation.
- 3. Safe pavement sloughs will be maintained as described in the Department's shoulder/slough guidelines. If there is no shoulder the slough should have a minimum slough of 3:1.
- 4. The traffic volumes shown are general guidelines. A 10% tolerance in the volumes may be allowed without requiring the designer to move to the next level of standard or the need for a design exception.
- 5. If a rural community or a location(s) with different needs fall within a corridor project and is identified in the scoping process, another strategy may be used. Rural communities may include items such as Complete Streets concepts, Rural Community Enhancements Projects (RCEP) or other enhancements that federal funding may allow.
- 6. A rail system is defined as both the bridge and/or roadway facility rail system servicing as one entire rail system protecting an individual structure or obstruction, which may include the following items:
  - end treatments and end terminals
  - linear guardrail runs
  - transition sections
  - bridge rails

A mainline roadway strategy and individual structure strategy within the mainline project limits may be different. The mainline roadway strategy dictates the minimum safety work throughout the corridor unless a structure strategy is higher. The higher structure strategy safety work shall be used for that structure's rail system.

If the roadway strategy requires the bridge rail to be in compliance with MASH, the bridge rail at a minimum shall comply with MASH Test

Level 3. However, if a portion of the bridge deck needs to be removed in order to upgrade the bridge rail to be in minimum compliance with MASH Test Level 3, the bridge rail will instead be required to be in minimum compliance with NCHRP Report 350 Test Level 3.

On Minor Rehabilitation and Structural Improvement roadway projects, the rail system may be left in place if the rail system was originally installed in compliance with NCHRP Report 350 or MASH performance criteria, and has been maintained in a condition that is in reasonably close conformity to NCHRP Report 350 or MASH performance criteria.

#### I-06.03.01 Preventive Maintenance

Traffic Data	Use current ADT
Roadway Width	Use appropriate width to meet or exceed NDDOT Guidelines for
	Minimum Roadway Width.
Superelevations	Use existing.
Design Speed	Use posted speed limit.
Cross Slope	Use existing.
Horizontal Curvature	Use existing.
Vertical Curvature	Use existing.
Obstruction	Use existing.
Clearance	
Foreslope	Use existing.
Roadway	
Shoulder/Slough	Use Department Shoulder/Slough Guidelines.
Cross Slope	
Safety	Safety issues will be identified and addressed as part of the Statewide
	Safety Program. Safety features will remain as they exist unless a need
	is identified.
ADA	Curb ramps adjacent to the project shall be addressed in accordance
	with the Departments "ADA Transition Plan" and decision document
	for "Curb Ramp Improvements on Alteration Projects".

## **Design Guidelines for Preventive Maintenance Projects**

The purpose of the Preventive Maintenance program is to protect the pavement structure, slow the rate of pavement deterioration and/or correct pavement surface deficiencies. Surface treatments used for preventive maintenance are targeted at pavement surface defects primarily caused by the environment and by the daily wear and tear of traffic. Structural deficiencies caused by traffic loading are not corrected by using these treatments.

Preventive Maintenance treatments may be applied as frequently as supported by a cost effectiveness determination Most preventive maintenance projects will be conducted on the top of the existing roadway and will have no impact to wetlands or cultural resources. Miscellaneous features such as mailboxes, signing, delineators and others will not be required to be upgraded as part of these projects unless identified by the Statewide Safety Program. Signage not in compliance with the MUTCD will be updated if engineering judgment indicates that:

- One compliant device in the midst of a series of adjacent non-compliant devices could potentially be confusing to road user.
- The anticipated schedule for replacement of the whole series of non-compliant devices will result in achieving timely compliance with the MUTCD.

All railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

Typical scope of work items, including but not limited to, for Preventive Maintenance treatments are: Crack Pouring/Sealing, Route and Seal, Seal Coats, Micro-Milling, Micro-Surfacing,

## SECTION I-06\_\_\_\_ Design Guidelines, Investment Strategy, and Design Exceptions Page 66 Revised 10/24/2022

Pavement Patching, Milling and/or Asphalt Overlay 2" Maximum with or without Full Depth Pavement Repair\*, Repair of depressed cracks, Minor Concrete Pavement Repair (less than 10% of the pavement surface area per mile), Dowel Bar Retrofit, Diamond Grinding, Rumble Strips, Pavement Marking, Signals, etc.

\*Milling and/or Asphalt Overlay 2" Maximum except at full depth pavement repair areas. These areas are limited to matching the existing pavement depth plus the 2" overlay.

- The full depth pavement repair shall be limited to a maximum of 2% of the total square yards of the project, and a maximum of 1000 square yards per mile.
- The full depth pavement repair shall be limited to 12" maximum depth below the bottom of existing asphalt layer.
- The full depth pavement repair will not be allowed at reoccurring frost heaves or in areas with an existing pipe.
- The full depth pavement repair work shall be performed from on top of the roadway. The adjacent foreslope topsoil shall not be disturbed, and no construction equipment or traffic is allowed in the ditch bottom. The pavement/aggregate slough shall be re-established to match existing.
- No allowance for rut filling. Consider milling. If rut filling is needed, the quantity shall be taken from the overall mainline quantity.

#### I-06.03.02 Minor Rehabilitation

Traffic Data	Use current ADT
Roadway Width	Use appropriate width to meet or exceed NDDOT Guidelines for Minimum Roadway Width. May widen each side 2' to 4' based upon corridor needs.
Superelevations	Use existing.
Design Speed	Use posted speed limit
Cross Slope	Use existing.
Horizontal Curvature	Use existing.
Vertical Curvature	Use existing.
Obstruction Clearance	Use existing.
Foreslope	Use existing when not widening. Use 4:1 or flatter when widening.
Roadway Shoulder/Slough Cross Slope	Use Department Shoulder/Slough Guidelines.
Safety	Safety issues will be identified and addressed as part of the Statewide Safety Program. Safety features will remain as they exist unless a need is identified. Safety hardware that is not in compliance with NCHRP Report 350 performance criteria will be upgraded to be in compliance with MASH* performance criteria. Existing guardrail that is in compliance with NCHRP Report 350 except for rail height, may be reset to correct rail height for compliance with NCHRP Report 350.
ADA	Curb ramps adjacent to the project shall be addressed in accordance with the Departments "ADA Transition Plan" and decision document for "Curb Ramp Improvements on Alteration Projects".

## **Design Guidelines for Minor Rehabilitation Projects**

\* If safety hardware is not available for MASH performance criteria, safety hardware shall instead be required to be in compliance with NCHRP Report 350 performance criteria.

*Minor Rehabilitation* is a planned strategy to extend the useful life of a highway by restoring the pavement structure without necessarily improving existing alignment and profile geometrics. The minor rehabilitation of roadways will use repair techniques designed to repair pavement distress areas primarily caused by the environment and by the daily wear and tear of traffic. A minor rehabilitation strategy will restore the load carrying capacity to its original condition. The appropriate NEPA process will be followed to address any environmental impacts.

Miscellaneous features such as mailboxes, signing, delineators and others will not be required to be upgraded as part of these projects unless identified by the Statewide Safety Program. Signage not in compliance with the MUTCD will be updated if engineering judgment indicates that:

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- One compliant device in the midst of a series of adjacent non-compliant devices could potentially be confusing to road user.
- The anticipated schedule for replacement of the whole series of non-compliant devices will result in achieving timely compliance with the MUTCD.

All railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

Typical scope of work items, including but not limited to, for Minor Rehabilitation treatments are: Asphalt Overlay up to 3", Distress Area Repairs and Asphalt Overlay, Mill & Overlay up to 3", Cold In-Place Recycling (CIR), Widening 2' to 4' on each side of the roadway to meet or exceed NDDOT Guidelines for Minimum Roadway Width, etc.

The intent of this strategy is to fit widening within the right of way and limit ditch widening to addressing wetland mitigation, borrow, snow problem areas, etc.

#### I-06.03.03 Structural Improvements

Traffic Data	Use 20 year projected
Roadway Width	Use appropriate width to meet or exceed NDDOT Guidelines for Minimum Roadway Width. May widen each side based upon corridor needs.
Superelevations	Attempt to correct to AASHTO Standards. (6% max superelevation)
Design Speed	Use posted speed limit
Cross Slope	Driving Lanes 1.5% - 2.5%.
Horizontal Curvature	Use existing, sign when less than posted speed.
Vertical Curvature	Use existing.
Obstruction Clearance	20 feet.
Foreslope	Use existing when not widening unless a need is identified in the Safety Review. Use 4:1 or flatter when widening.
Roadway Shoulder/Slough Cross Slope	Use Department Shoulder/Slough Guidelines.
Safety	Safety issues will by identified and addressed as part of the Statewide Safety Program. Safety features will remain as they exist unless a need is identified. Safety hardware that is not in compliance with NCHRP Report 350 performance criteria will be upgraded to be in compliance with MASH* performance criteria. Existing guardrail that is in compliance with NCHRP Report 350 except for rail height, may be reset to correct rail height for compliance with NCHRP Report 350. Replace mailbox supports where necessary.
ADA	Curb ramps adjacent to the project shall be addressed in accordance with the Departments "ADA Transition Plan" and decision document for "Curb Ramp Improvements on Alteration Projects".

## **Design Guidelines for Structural Improvements Projects**

\* If safety hardware is not available for MASH performance criteria, safety hardware shall instead be required to be in compliance with NCHRP Report 350 performance criteria.

*Structural improvement* is a planned strategy to extend the useful life of a highway by restoring or enhancing the pavement structure without necessarily improving existing alignment and profile geometrics.

Typical scope of work items, including but not limited to, for Structural Improvement treatments are: white topping, major concrete repair (greater than 10% of the pavement surface area per mile), full depth reclamation, crack and seat or break and seat and HMA overlay or an HMA

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overlay based on an engineering analysis. Structural Improvements also include widening each side of the roadway to meet or exceed NDDOT Guidelines for Minimum Roadway Width. A structural improvement will increase the load carrying capacity to meet the HPCS guidelines. The appropriate NEPA process will be followed to address any environmental impacts. All regulatory and warning signs and pavement markings will be verified to comply with current MUTCD standards or brought up to MUTCD standards if necessary, and all railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

## I-06.03.04 Major Rehabilitation

Roadway WidthUse appropriate width to meet or exceed NDDOT Guidelines for Minimum Roadway Width.SuperelevationsCorrect to AASHTO Standards. (6% max superelevation)Design SpeedUse posted speed limit.Cross SlopeDriving lanes 1.5 - 2.5%.Herizentel ComputerUse posted speed here the meeted one State of the second computer of
Minimum Roadway Width.         Superelevations       Correct to AASHTO Standards. (6% max superelevation)         Design Speed       Use posted speed limit.         Cross Slope       Driving lanes 1.5 – 2.5%.         Herizentel Currentum       Use cristing given when here the needs on State on the second constant.
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Design SpeedUse posted speed limit.Cross SlopeDriving lanes 1.5 - 2.5%.Harizantal ComputingUse arriting size when here the needs on State of the second se
Cross SlopeDriving lanes $1.5 - 2.5\%$ .Userizantel ComputingUse spinting size when loss the superior of th
Haringantal Congretures   Has existing along when here to deep at 1 and 1. On St. t. 1
nonzontal Curvature   Use existing, sign when less than posted speed. On State and
Interregional Corridors with ADT >750, if existing horizontal
curvature is designed for less than 15 mph less than the posted
speed make cost effective improvement or sign accordingly.
Vertical Curvature Interregional System: ADT < 2000 maintain existing. ADT >
2000 use stopping sight distance for crest curve design and
comfort curve design for sag curves. Decision sight distance
should be considered in areas where complex driver decisions are
required such as intersections with major collectors or higher,
interchanges, lane drops or additions, etc. Passing areas should
be provided at reasonable intervals based on terrain and traffic
volumes. A rule of thumb would be a passing area every 3 to 5
miles when the ADT <2000 and every 3 miles when the ADT
>2000.
State Corridors, District Corridors & Collectors: ADT <
2000, existing vertical curves should meet a design speed of no
less than 20 mph below the overall project design speed. ADT >
2000 use stopping sight distance for crest curve design and
comfort curve design for sag curves. Passing areas should be
provided at reasonable intervals based on terrain and traffic
volumes. A rule of thumb would be a passing area every 3 to 5
miles when the AD1 <2000 and every 3 miles when the AD1
2000. Obstruction Uncertained as fatz model to 20 fact abstruction abstruction of a model.
$C_{locum} = C_{locum} = C_{l$
Zono when ADT >2000 use AASHTO roadside design clear zone.
Example $4:1**$ minimum on Interracional system > 2000 ADT a 6:1
foreslope is desirable where grading or roadway widening is
required
Roadway Use Department Shoulder/Slough Guidelines
Shoulder/Slough
Cross Slope
Safety A 90-1 survey will be completed and areas needing safety
improvements will be addressed. Upgrade safety hardware to be
in compliance with MASH* performance criteria.
ADA Curb ramps adjacent to the project shall be addressed in

## Design Guidelines for Major Rehabilitation Projects

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accordance with the Departments "ADA Transition Plan" and
decision document for "Curb Ramp Improvements on Alteration
Projects".

\* If safety hardware is not available for MASH performance criteria, safety hardware shall instead be required to be in compliance with NCHRP Report 350 performance criteria.

\*\*Foreslope rates often have variations along the existing slope due to normal wear and tear, flexibility is allowed in determining the overall foreslope rate to account for these variations.

*Major Rehabilitation* is a planned strategy in which major work is performed to bring a highway up to an acceptable condition to extend the service life and provide operational improvements (i.e. adding turn lanes).

Major rehabilitation projects may include reclaiming the existing surface material and base along with the placement of additional surface material and/or other work necessary to return an existing roadway, including shoulders, bridges, the roadside, and appurtenances to a condition of structural or functional adequacy. On these projects the roadway elevation may change, shoulders may be added, and foreslope corrections may be made. The roadway will be resurfaced and safety improvements will be completed as required. A crash analysis will be completed and cost effective enhancements will be addressed. All regulatory and warning signs and pavement markings will be verified to comply with current MUTCD standards or brought up to MUTCD standards if necessary, and all railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

Typical scope of work items, including but not limited to, for Major Rehabilitation treatments are: HMA, Widening, Geometric Upgrades, etc.
## I-06.03.05 New/Reconstruction Projects

Traffic Data	Use 20 year projected
Roadway Width	Use AASHTO Standards.
Superelevations	Use AASHTO Standards. (6% max superelevation)
Design Speed	Use posted speed limit.
Cross Slope	Driving lanes 1.5 – 2.5%.
Horizontal Curvature	Use AASHTO Standards.
Vertical Curvature	Interregional System: Use stopping sight distance for crest
	curve design and comfort curve design for sag curves. Decision
	sight distance should be considered in areas where complex driver
	decisions are required such as intersections with major collectors
	or higher, interchanges, lane drops or additions, etc. Passing
	areas should be provided at reasonable intervals based on terrain
	and traffic volumes. A rule of thumb would be a passing area
	every 3 to 5 miles when the ADT <2000 and every 3 miles when
	the ADT >2000.
	State Corridors, District Corridors & Collectors: Use stopping
	sight distance for crest curve design and comfort curve design for
	sag curves. Passing areas should be provided at reasonable
	intervals based on terrain and traffic volumes. A rule of thumb
	would be a passing area every 3 to 5 miles when the ADT <2000
	and every 3 miles when the ADT $>$ 2000.
Clear Zone	Use AASHTO roadside design clear zone.
Foreslope	Use 4:1 except Interregional system > 2000 ADT and Interstate
	use 6:1
Pavement	Use AASHTO Standards.
Shoulder/Slough	
Cross Slope	
Safety	Safety hardware will be in compliance with MASH* performance
	criteria.
ADA	Pedestrian facilities adjacent to the project shall be addressed in
	accordance with the Departments "ADA Transition Plan".

# **Design Guidelines for New/Reconstruction Projects**

\* If safety hardware is not available for MASH performance criteria, safety hardware shall instead be required to be in compliance with NCHRP Report 350 performance criteria.

*New/Reconstruction* is a planned strategy in which a new road is constructed. This work may include work items such as relocating an existing route on new alignment, or completely removing the old pavement structure and restoring the roadbed and surfacing, or major widening on an existing roadway to increase traffic capacity (excludes realigning horizontal curves).

On New/Reconstruction projects a crash analysis will be completed and cost effective enhancements will be addressed. All safety hardware will be in compliance with MASH\* performance criteria. All regulatory and warning signs and pavement markings will be verified

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to comply with current MUTCD standards or brought up to MUTCD standards if necessary, and all railroad crossings will have adequate warning/protective devices in place or be otherwise addressed in the State Railroad Crossing Improvement Program.

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# I-06.03.06 Minimum Roadway Width on Four Lane Highways

# Minimum Roadway Width on Four Lane Highways

Interstate 4 - Lane	<400	400-750	750-1500	1500-2000	>2000
New /	AASHTO STDS				
Reconstruction					
Major Rehabilitation	AASHTO STDS				
Structural	Maintain Existing				
Improvement					
Minor Rehabilitation	Maintain Existing				
PM	Maintain Existing				

Interregional 4 - Lane	<400	400-750	750-1500	1500-2000	>2000
New / Reconstruction	AASHTO STDS				
Major Rehabilitation	36	36	36	36	36
Structural	32	32	32	32	32
Improvement					
Minor Rehabilitation	32	32	32	32	32
PM	31	31	31	31	31

### I-06.03.07 Minimum Roadway Width on Two Lane Highways Minimum Roadway Width on Two Lane Two Way Highways

Interregional 2 - Lane	<400	400-750	750-1500	1500-2000	>2000
New / Reconstruction	32	36	36	36	40
Major Rehabilitation	30	30	36	36	36
Structural Improvement	26	26	28	30	32
Minor Rehabilitation	26	26	28	30	32
PM	26	26	28	28	30
State Corridor	<400	400-750	750-1500	1500-2000	>2000
New / Reconstruction	32	36	36	36	40
Major Rehabilitation	*28	*28	*32	36	36
Structural Improvement	24	24	28	28	32
Minor Rehabilitation	24	24	26	28	32
PM	24	24	26	26	28
<b>District Corridor</b>	<400	400-750	750-1500	1500-2000	>2000
District Corridor New / Reconstruction	<400 32	400-750 36	750-1500 36	1500-2000 36	>2000 40
District Corridor New / Reconstruction Major Rehabilitation	<400 32 *26	400-750 36 *28	750-1500 36 *30	1500-2000 36 32	>2000 40 36
District Corridor New / Reconstruction Major Rehabilitation Structural Improvement	<400 32 *26 22	400-750 36 *28 24	750-1500 36 *30 26	1500-2000 36 32 26	>2000 40 36 28
District Corridor New / Reconstruction Major Rehabilitation Structural Improvement Minor Rehabilitation	<400 32 *26 22 22	400-750 36 *28 24 24	750-1500 36 *30 26 26	1500-2000 36 32 26 26	>2000 40 36 28 28
District CorridorNew / ReconstructionMajor RehabilitationStructural ImprovementMinor RehabilitationPM	<400 32 *26 22 22 22 22	400-750 36 *28 24 24 24 24	750-1500 36 *30 26 26 24	1500-2000 36 32 26 26 26 26	>2000 40 36 28 28 28 28 26
District Corridor New / Reconstruction Major Rehabilitation Structural Improvement Minor Rehabilitation PM	<400 32 *26 22 22 22 22	400-750 36 *28 24 24 24 24 24	750-1500   36   *30   26   26   24	1500-2000 36 32 26 26 26 26	>2000 40 36 28 28 28 26
District CorridorNew / ReconstructionMajor RehabilitationStructural ImprovementMinor RehabilitationPMDistrict Collector	<400 32 *26 22 22 22 22	400-750 36 *28 24 24 24 24 24 24 400-750	750-1500   36   *30   26   26   24   750-1500	1500-2000     36     32     26     26     26     1500-2000	>2000 40 36 28 28 28 28 26 >2000
District CorridorNew / ReconstructionMajor RehabilitationStructural ImprovementMinor RehabilitationPMDistrict CollectorNew / Reconstruction	<400 32 *26 22 22 22 22 <400 32	400-750 36 *28 24 24 24 24 24 400-750 36	750-1500   36   *30   26   26   24   750-1500   36	1500-2000     36     32     26     26     26     26     32     32     32     32     33     34     35     36     36	>2000 40 36 28 28 28 26 >2000 40
District CorridorNew / ReconstructionMajor RehabilitationStructural ImprovementMinor RehabilitationPMDistrict CollectorNew / ReconstructionMajor Rehabilitation	<400	400-750 36 *28 24 24 24 24 400-750 36 *26	750-1500   36   *30   26   26   24   750-1500   36   *28	1500-2000     36     32     26     26     26     26     30	>2000 40 36 28 28 26 >2000 40 30
District CorridorNew / ReconstructionMajor RehabilitationStructural ImprovementMinor RehabilitationPMDistrict CollectorNew / ReconstructionMajor RehabilitationStructural Improvement	<400	400-750 36 *28 24 24 24 24 400-750 36 *26 22	750-1500   36   *30   26   26   26   26   36   *28   24	1500-2000     36     32     26     26     26     26     30     26	>2000 40 36 28 28 28 26 >2000 40 30 26
District Corridor   New / Reconstruction   Major Rehabilitation   Structural Improvement   Minor Rehabilitation   PM   District Collector   New / Reconstruction   Major Rehabilitation   Structural Improvement   Minor Rehabilitation   Minor Rehabilitation   Minor Rehabilitation   Major Rehabilitation   Structural Improvement   Minor Rehabilitation	<400	400-750   36   *28   24   24   24   24   36   *28   24   24   24   24   24   24   24   24   24   24   24   24   24   24   24   24   24   24   24   25	750-1500   36   *30   26   26   24   750-1500   36   *28   24   24	1500-2000   36   32   26   26   26   26   36   30   26   26	>2000 40 36 28 28 26 >2000 40 30 26 26 26

• The intent of these guidelines is not to reduce the roadway width to the minimum guidelines, but rather to maintain the width as close as possible to the existing width. Roadway widths shown are the minimum recommended widths, actual allowable widths should be determined on a case by case basis.

• A design exception is only needed on a Preventive Maintenance Thin Lift Overlay (TLO) that does not meet the minimum roadway width requirement. All other Preventive Maintenance types of work do not require a design exception for minimum roadway width.

• District Corridor routes on the National Highway System (NHS) will be designed to State Corridor Guidelines

• Numbers in the shaded areas are ADT. Roadway widths are in feet.

\* Minimum roadway widths for "Major Rehabilitation" strategies will be the same as "Minor Rehabilitation" strategies, unless widening is required. If widening is required to meet "Minor Rehabilitation" strategies minimum widths, widening will be sufficient to meet "Major Rehabilitation" strategies minimum widths.

I-06.03.08 Minimum Interstate and Four Lane Divided Highway Bridge Widths

Interstate & Four Lane Divided	
Highway	All ADT
*New or Reconstructed	40'
*Rehabilitation	Approach Roadway Width
Preventive Maintenance	Existing Bridge Width

\* This bridge width is for a two lane roadway. Bridge widths will be determined on an individual bases, where there are 3 lanes or more, ramps or auxiliary lanes impacting the bridge.

The bridge widths in the above table are dimensions measured from face-to-face of curb or face-to-face of rail whichever is less.

The minimum bridge width shall be as shown in the table or the approach roadway width (traveled lanes plus shoulders), whichever is greater.

Deck replacements and deck overlays are in the Rehabilitation category.

Any new or reconstructed two lane bridge over railroad tracks shall be a minimum of 40' wide.

For Interstate System bridges longer than 200', the traveled lanes plus 4' on each side is an acceptable bridge width when considering new or reconstruction.

In assessing acceptable Interstate System bridge widths for rehabilitation of bridges or bridges to remain in place without rehabilitation within the limits of paving or re-grading projects: 1) bridges longer than 200', that are as wide as the traveled lanes plus 3.5' on each side are acceptable, 2) bridges shorter than 200', that are as wide as the table less 4' are acceptable; if there are no reported crash problems at that site.

For other four lane divided rural bridges longer than 200', the traveled lanes plus 4' on each side is an acceptable bridge width when considering new or reconstruction.

In assessing other four lane rural divided bridge widths for rehabilitation of bridges or bridges to remain in place without rehabilitation within the limits of paving or regarding projects: 1) bridges longer than 200', that are as wide as the traveled lanes plus 2' on each side are acceptable, 2) bridges shorter than 200', that are as wide as the table less 4' are acceptable; if there are no reported crash problems at that site.

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# Bridge Rail:

- For bridge New or Reconstruction category projects, the bridge rail shall be in compliance with MASH Test Level 4 performance criteria.
- For bridge Rehabilitation category projects, the existing bridge rail can remain in place if in minimum compliance with NCHRP Report 350 Test Level 3 performance criteria. If the existing bridge rail is not in minimum compliance with NCHRP Report 350 Test Level 3 performance criteria, the bridge rail will be upgraded to be in minimum compliance with MASH Test Level 3 performance criteria. However, if a portion of the bridge deck needs to be removed in order to upgrade the bridge rail to be in minimum compliance with MASH Test Level 3 performance criteria, the bridge rail will instead be required to be in minimum compliance with NCHRP Report 350 Test Level 3 performance criteria. Bridge Approach Repair, Bridge Rail Repair, Deck Overlay, Deck Replacement, etc. are all examples of bridge rehabilitation.
- For bridge Preventive Maintenance category projects, the existing bridge rail can remain. • Slope Protection repair, joint repair, painting, scour repair, abutment repair, pier repair, damaged railing repair, etc. are all examples of bridge preventive maintenance.

# I-06.03.09 Minimum State Route Bridge Widths

Interregional 2 Lane	< 400**	400-750**	750-1500**	1500-2000**	> 2000**
New or Reconstructed	32'	36'	36'	36'	40'
Rehabilitation	28'	30'	30'	32'	32'
Preventive Maintenance		E	xisting Bridge Wi	dth	
State Corridor	< 400*	400-750*	750-1500*	1500-2000**	> 2000**
New or Reconstructed	32'	36'	36'	36'	40'
Rehabilitation	28'	30'	30'	32'	32'
Preventive Maintenance		E	xisting Bridge Wi	dth	
<b>District Corridor</b>	< 400*	400-750*	750-1500*	1500-2000**	> 2000**
New or Reconstructed	32'	36'	36'	36'	40'
Rehabilitation	28'	30'	30'	32'	32'
Preventive Maintenance	Existing Bridge Width				
District Collector	< 400*	400-750*	750-1500*	1500-2000**	> 2000**

<b>District</b> Collector	< 400*	400-750*	750-1500*	1500-2000**	> 2000**
New or Reconstructed	32'	36'	36'	36'	40'
Rehabilitation	28'	30'	30'	32'	32'
Preventive Maintenance	Existing Bridge Width				

\* Existing bridge widths can remain if there is no crash history.

\*\* For rehabilitation strategies or for bridges to remain in place within paving or re-grading projects, bridge widths are acceptable if the following criteria are met and there is no crash history

- 1. The existing width is no more than 4' less than shown in the table; and,
- 2. The existing width is no more than 6' less than the approach roadway.

All bridge widths in the above table are dimensions measured from face-to-face of curb or face-to-face of rail whichever is less. Deck replacements and deck overlays are in the Rehabilitation category.

Any new or reconstructed two lane bridge over railroad tracks shall be a minimum of 40' wide.

For bridges longer than 200', the traveled lanes plus 4' on each side is an acceptable bridge width when considering new or reconstruction. Bridge Rail:

• For bridge New or Reconstruction category projects, the bridge rail shall be in compliance with MASH Test Level 4 performance criteria.

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- For bridge Rehabilitation category projects, the existing bridge rail can remain in place if in minimum compliance with NCHRP Report 350 Test Level 3 performance criteria. If the existing bridge rail is not in minimum compliance with NCHRP Report 350 Test Level 3 performance criteria, the bridge rail will be upgraded to be in minimum compliance with MASH Test Level 3 performance criteria. However, if a portion of the bridge deck needs to be removed in order to upgrade the bridge rail to be in minimum compliance with MASH Test Level 3 performance criteria, the bridge rail will instead be required to be in minimum compliance with MASH Test Level 3 performance criteria. Bridge Approach Repair, Bridge Rail Repair, Deck Overlay, Deck Replacement, etc. are all examples of bridge rehabilitation.
- For bridge Preventive Maintenance category projects, the existing bridge rail can remain. Slope Protection repair, joint repair, painting, scour repair, abutment repair, pier repair, damaged railing repair, etc. are all examples of bridge preventive maintenance.

# **OTHER ROUTES**

For county route traffic bridges that are State owned bridges that do not carry state route traffic, widths will be addressed on an individual basis.

For State owned bridges on county roads. i.e. county roads over the Interstate:

<= 750 ADT, existing width adequate, if no crash history

> 750 ADT, existing width adequate if no more than 6' less than the width of the approach roadway, if no crash history.

For Preventive Maintenance projects existing bridge widths can remain.

Slope Protection repair, joint repair, painting, scour repair, abutment repair, pier repair, damaged railing repair, etc. are all examples of bridge preventive maintenance. For these types of preventive maintenance projects, the existing railing system can remain.



\*Note 1: If bridge rail retrofit to MASH TL-3 is not available, update to NCHRP Report 350 TL-3 \*Note 2: If Jersey Barrier is in place, the Jersey barrier may remain in place since it meets MASH TL-3

Acronyms: 230 = NCHRP Report 230 350 = NCHRP Report 350 PM = Preventive Maintenance MiR = Minor Rehab SI = Structural Improvement MaR = Major Rehab N/R = New/Reconstruction



May 10, 2017



I-06.03.10 Department Shoulder/Slough Guidelines

















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# I-06.04 Design Exceptions

Designers contemplating the need for the use of design values, on a specific project, which are not in compliance with the accepted DESIGN GUIDELINES listed earlier in this chapter, must document and obtain approval of a formal design exception.

The Design Exception will be a standalone document, and will not be included within the environmental document. However, Design Exceptions will typically be submitted to the DDE for approval at the same time as the environmental document. Design Exceptions will only be submitted to FHWA for approval if required by a RBSO plan.

Design exceptions are not required on Interstate projects utilizing a Major Rehabilitation strategy or less for horizontal or vertical alignments, widths of median, traveled way, and shoulders provided these features met standards when they were built and are not reduced by the project. The remaining design criteria, including traffic barriers, must meet current standards or undergo the design exception process. Where the type of work is reconstruction, current standards are to be applied throughout the project including bridges to remain in place.

Design Exceptions shall be written and presented in the format shown in the Design Exception Form found on the web at

http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm under Design Manual Reference and Forms in the "Design Exception Form" table.

A Design Exception must be written for each design element that does not meet standards. Multiple design elements cannot be combined in a single Design Exception.

Supplemental items to consider when evaluating a design exception:

- Crash history to determine any history of operational problems.
- Functional classification of the roadway.
- Effect of the variance from the design standard on safety and operations. •
- The degree of the variance from the standard. •
- Compatibility with adjacent sections of roadway. •
- Should not degrade the relative safety of the roadway. •
- Amount and character of the traffic. •
- Posted and actual speed on the route. •
- Type of project contemplated. •
- Cost of attaining full standards (including environmental impacts). •
- Cost-effective means of mitigating the reduction in standard. •
- Program of future projects, in particular, whether future improvements may more be • economically correct the design feature at a later date.
- Engineering discretion

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I-06.05 Statewide Safety Program

## STATEWIDE SAFETY PROGRAM

# **ANALYSIS STRATEGIES**

The Statewide Safety program will consist of four different types of analysis. Safety projects will be based on corridor improvements. A corridor is defined as the intersection of State Highway to State Highway as shown in the figure below.



### 1. Critical Rate Analysis

The NDDOT will review the entire state highway system on a yearly basis in an effort to identify the sections of roadway corridor that exhibit the highest crash rates. Those corridors of highways that exhibit a crash rate higher than the critical rate for their particular Highway Performance Classification System (HPCS) will be reviewed in greater detail to determine if there are cost effective measures that can be made or if engineering judgment determines that improvements should be made.

The Concept of "Critical Crash Rate" suggests that any sample or category of intersections or roadway corridors can be divided into three basic parts:

- Locations with a crash rate below the average will be eliminated from further review.
- Locations with a crash rate above the average, but below the critical rate are locations where there is a very high probability (90-95%) that the higher than average crash rate is due to the random nature of crashes.
- Locations with a crash rate above the critical rate will be reviewed because there is a high probability (90-95%) that conditions at the site are contributing to the higher crash rate

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Critical crash rate is calculated:  $R_c = R_a + K(R_a/m)^{1/2} - 0.5/m$  (Critical crash rate is based on MnDOT Methodologies)

R<sub>c</sub> = Critical Crash Rate for: Intersections: crashes per MEV Corridors: crashes per MVM

R<sub>a</sub> = HPCS Average Crash Rate by intersection or HPCS type.

M = Vehicle Exposure During Study Period for: Intersections: ADT (365/10<sup>6</sup>) Corridors: ADT (365/10<sup>6</sup>) length

K = Constant based on Level of Confidence

Level of Confidence	0.995	0.950	0.900
K	2.576	1.645	1.282

Sample Graph



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# 2. High Crash Analysis

The High Crash Analysis will be done on a yearly basis for the entire state highway system. Those intersections or sections of roadway that are identified in this report will be reviewed in greater detail to determine if there are cost effective measures that can be made or if engineering judgment determines that improvements should be made.

# 3. Project level Analysis

On Structural Improvement, major rehabilitation and new construction projects, each project will be reviewed to determine if there are cost effective measures that can be made or if engineering judgment determines that improvements should be made.

## 4. Strategic Highway Safety Plan (SHSP)

On Structural Improvement, major rehabilitation and new construction projects, each project will be reviewed to determine if there are cost effective measures that can be made that are related to the emphasis areas identified in the SHSP.

### **COUNTER MEASURES**

Appendix A provides examples of how identified "Areas of Concerns" and "Alternative Safety Measures" can be developed. The Alternative Safety Measures would be those measures that would be evaluated for cost effective improvements.

# **IMPLEMENTATION MEASURES**

Cost effective measures will be implemented one of two ways.

- 1. If the improvement is an improvement that should be made throughout the corridor, a safety project will be scheduled and included in the STIP. The goal would be to make the necessary improvements within three years of the highway improvement project or when safety funds are available.
- 2. If the improvement is specific to a feature that is contained within the limits of the project. The cost effective measure will be included with that project.

Example: If the superelevation on a curve is identified as a hazard, a cost effective measure as identified in Appendix A will be used to correct the hazard during construction of the project.

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# **COUNTER MEASURES**

Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
Run-Off-Road	Slippery pavement/	Check skid resistance	Reduce speed limit if justified by spot speed study
	ponded water	Check for adequate	Provide "SLIPPERY WHEN WET" signs
		drainage	Provide adequate drainage
		Perform spot speed	Groove existing pavement
		study	Overlay existing pavement
	Roadway design	Check roadside	Install/improve traffic barriers
	inadequate for traffic	shoulders and road	Close curb lane
	conditions	maintenance	Flatten slopes/ditches
		Check superelevations	Relocate islands
		Perform ball-bank study	Improve alignment/grade
			Provide proper superelevations
			Provide escape ramp
			Widen lanes/shoulders
	Poor delineation	Review pavement	Install roadside delineators
		markings	Install advance warning signs
		Review signs and	Improve/install pavement markings
		placement	
	Poor visibility	Check roadway	Increase sign size
		illumination	Improve roadway lighting
	Improper channelization	Review channelization	Improve channelization
Collision at	Left-turning vehicles	Perform turning counts	Install median divider
driveways			Install two-way left-turn lanes
	Improperly located	Review driveway	Regulate minimum spacing of driveways
	driveway	placement	Regulate minimum corner clearance
			Move driveway to side street
			Install curbing to define driveway location
			Consolidate adjacent driveways
	Right-turning vehicles	Perform turning counts	Restrict parking near driveways
		Review Parking	Increase the width of the driveway
		Check driveway and	Increase curb radii
		lane width	Provide right-turn lanes
		Check curb radii	Widen through lanes
	Large volume of through	Perform volume count	Move driveway to side street

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Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
	traffic	for thru traffic	Construct a local service road
			Reroute through traffic
	Large volume of driveway	Perform volume count	Signalize driveway
	traffic	for driveway traffic	Provide acceleration and deceleration lanes
		Perform gap study	Channelize driveway
	Restricted sight distance	Field observation for	Restrict parking near driveways
		sight obstructions	Reduce speed limit if justified by spot speed study
		Review parking	Install/improve street lighting
		Check roadway	Remove sight obstruction
		illumination	
		Perform spot speed	
		study	
Sideswipe or	Inadequate road design	Review lane width	Perform necessary road surface repairs
head-on	and/or maintenance	Check alignment	Sign and mark unsafe passing areas
		Perform no passing	Provide roadside delineators
		study	Improve alignment/grade
		Check road surface for	Provide wider lanes
		proper maintenance	Provide passing lanes
	Inadequate shoulders	Review road shoulders	Improve shoulders
	Excessive vehicle speed	Perform spot speed	Reduce speed limit if justified by spot speed study
		study	Install median devices
	Inadequate pavement	Review pavement	Install/improve centerlines, lane lines, and edgelines
	markings	markings	Install reflectorized markers
			Install centerline rumble strips
	Inadequate channelization	Review channelization	Install/improve channelization
			Install acceleration and deceleration lanes
			Provide turning bays
	Inadequate signing	Review signing and	Provide advance direction and warning signs
		placement	Add illuminated name signs
Pedestrian/	Limited sight distance	Check sight distance	Remove sight obstruction
bicycle			Install/improve pedestrian crossing signs and markings
			Reroute pedestrian paths
	Inadequate protection	Check existing	Add pedestrian refuge islands

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Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
		protection	
	Inadequate signal/signs	Review signal/signs	Install/upgrade signals/signs
	Inadequate signal phasing	Review signal phasing	Change timing of pedestrian phase
			Add pedestrian "Walk" phase
	Inadequate pavement	Review pavement	Supplement markings with signing
	markings	markings	Upgrade pavement markings
	Inadequate lighting	Check roadway illumination	Improve lighting
	Driver has inadequate	Review existing parking	Prohibit parking
	warning of frequent mid-	Perform spot speed	Install warning signs
	block crossing	study	Reduce speed limit if justified by spot speed study
			Install pedestrian barriers
	Lack of crossing	Perform gap study	Install traffic/pedestrian signals
	opportunity		Install pedestrian crosswalk and signs
	Excessive vehicle speed	Perform spot speed	Reduce speed limits
		study	Install proper warning signs
	Pedestrians/bicycles on	Review existence of	Eliminate roadside obstructions
	roadways	sidewalks	Install curb ramps with detectable warning panels
			Install sidewalks
			Install bike lanes/paths
	Long distance to nearest	Check distance and	Install pedestrian crosswalk
	Crosswalk	travel time to nearest	Install pedestrian actuated signals
	Sidowelly too place to	Closswalk Deview existing	Mayo aidawalk latarally away from readyou
	Sidewalk too close to	Review existing	Move sidewark raterally away from roadway
	Cabaal areasing area	Sidewalks Chook podootriop	Establish save route and swareness program
	School crossing area	check pedesthan	Establish save foule and awareness program
			Install crosswalks and traffic signal
		Check school's safe	Install Closswarks and traffic signal
		route to and from school	
		program	
		Check school's student	
		awareness program	

Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
Bridges	Alignment	Check alignment	Install advance warning sings
			Improve delineation/markings
			Realign bridge/roadway
	Narrow roadway	Review lane width	Improve delineation/markings
		Review signing	Install signing/signals
			Widen structure
	Visibility	Field observation for site	Improve delineation/markings
		obstruction	Install advance warning sings
			Remove obstruction
	Vertical clearance	Check clearance	Improve delineation/markings
			Install advance warning sings
			Provide height restrictor/warning device
			Rebuild structure/adjust roadway grade
	Slippery surface (wet/icy)	Check skid resistance	Provide special signing
		Check for adequate	Provide adequate drainage
		drainage	Improve skid resistance
			Resurface deck
	Rough surface		Rehabilitate joints
			Resurface deck
			Regrade approaches
	Inadequate barrier system	Field observation and	Improve delineation/markings
		checks against	Remove hazardous curb
		established barrier	Upgrade bridge rail
		standards	Upgrade bridge approach rail connections
			Upgrade approach rail/terminals
Collisions at	Restricted sight distance	Review sight distance	Install advance warning signs
railroad			Remove sight obstructions
crossings			Install train actuated signals
			Install gates
			Reduce grades
	Poor visibility	Check roadway	Increase size of signs
		illumination	Improve roadway lighting
		Review signing	
	Inadequate pavement	Review pavement	Install advance markings to supplement signs

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Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
	marking	markings	Install stop bars
			Install/improve pavement markings
	Rough crossing surface	Check crossing surface	Improve crossing surface
	Sharp crossing angle	Check crossing angle	Rebuild crossing with proper angle
	Improper pre-emption	Review traffic signal	Retime traffic signals
	timing of traffic signals,	timing	Retime railroad signals and gates
	railroad signals, or gates	Review railroad signal	
		and gate timing	
Nightting	Deer visibility or lighting	Chaok reading	Install/improve werning singe
Nignume	Poor visibility or lighting	check roadway	Install/Improve warning sings
		murrimation	Install/improve defineation/markings
	Poor sign quality	Review signing	
		Iteview signing	Provide illuminated reflectorized signs
	Inadequate channelization	Review	Install pavement markings
	of delineation	channelization/delination	Improve channelization/delination
Wet pavement	Slippery pavement	Check skid resistance	Provide "SLIPPERY WHEN WET" signs
		Check for adequate	Reduce speed limit if justified by spot speed study
		drainage	Provide adequate drainage
		Perform spot speed	Groove existing pavement
		study	Overlay existing pavement
	Inadequate pavement	Review pavement	Install raised/reflectorized pavement markings
	marking	markings	
Rear-end	Pedestrian crossing	Review pedestrian	Install/improve signing or marking for pedestrian crosswalks
collisions at		signing and crosswalk	Relocate crosswalk
unsignalized intersections		marking	
	Driver not aware of	Review signing	Install/improve warning signs
		Charly alvid maniataman	
	Suppery surface	Check skid resistance	Provide "SLIPPERY WHEN WEI" signs
			Reduce speed limit if justified by spot speed study
		Dorform and	Grouve existing pavement
		study	
		Sludy	

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Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
	Large number of turning	Perform turning counts	Prohibit turns
	vehicles	Perform volume count	Increase curb radii
		for thru traffic	Create left-of-right-turn lanes
Collisions with	Inadequate road design	Check lane width	Change from angle to parallel parking
parked cars or cars being		Review parking angle	Prohibit parking
			Widen lanes/shoulders
parked	Large parking turnover	Perform paring turnover	Prohibit parking
		study	Change from angle to parallel parking
			Create one-way streets
			Create off-street parking
	Improper pavement	Review pavement	Correct pavement markings
	markings	markings	
	Illegal parking	Law observance study	Enforcement
Overturn	Roadside features	Determine sideslope	Provide traversable culvert end treatments
		Investigate recovery	Extend culverts
		zone	Install/improve traffic barriers
			Flatten slopes and ditches
			Relocate drainage facilities
	Inadequate shoulder	Determine shoulder	Upgrade shoulder surface
		dimensions and	Remove curbing obstruction
		composition	Widen lane/shoulder
		Check for shoulder drop	
		offs	
	Pavement feature	Check for potholes	Eliminate edge drop off
		Check for water ponding	Improve superelevation/crown
<b>E</b> : 1 1			
Fixed object	Obstruction in or too close	Field observation to	Delineation/reflectorize safety hardware
	to roadway	locate obstruction	Remove/relocate obstacles
			Install breakaway features to light poles, signposts, etc.
			Protect objects with guardrall
		Ob a ala illana in a ti an	
	Inadequate lighting		Improve roadway lighting
	Inadequate pavement	Review pavement	Install reflectorized pavement lines/raised markers

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Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
	marking	markings	
	Inadequate signs,	Review signs,	Install reflectorized paint, and/or reflectors on the fixed object
	delineators and guardrail	delineators and	Add special signing
		guardrails	Upgrade barrier system
	Inadequate road design	Check roadside	Install Warning signs/delineators
		shoulders and	Improve alignment/grade
		maintenance	Provide proper superelevation
		Check superelevation	Provide wider lanes
		Perform ball-bank study	
	Slippery surface	Check skid resistance	Reduce speed limit if justified by spot speed study
		Check for adequate	Provide adequate drainage
		drainage	
Right-angle	Restricted sight distance	Filed observations for	Install warning signs
collisions at		sight obstructions	Install stop signs
unsignalized		Check roadway	Install yield signs
intersections		illumination	Restrict parking near corners
		Perform spot speed	Reduce speed limit if justified by spot speed study
		study	Remove sign obstructions
			Install signals
			Install/improve street lighting
			Channelize intersection
	Large total intersection	Volume count on all	Install signals
	volume	approaches	
	High approach speed	Perform spot speed	Reduce speed limit if justified by spot speed study
		study	Install rumble strips
Right-angle	Poor visibility of signals	Review existing signals	Install advanced warning devices
collisions at		and placement	Install visors
signalized		Field observation for	Install back plats
intersections		sight obstructions	Reduce speed limit if justified by spot speed study
		Perform spot speed	Remove sight obstructions
		study	Add additional signal heads
			Install 12-inch signal lenses
			Improve location of signal heads

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Crash Type	Possible Cause	Possible Study	Possible Safety Enhancement
			Install overhead signals
	Inadequate signal timing	Volume count on all	Adjust amber phase
		approaches	Provide all-red clearance phases
		Review signal timing	Add multi-dial controller
			Install signal actuation
			Retime signals
			Provide progression through a set of signalized intersections

## I-07.01 Plan Reviews

All major highway construction projects will normally undergo three plan reviews from the outset of the preliminary design stage to completion of the final plans. These reviews are:

-Preliminary Plan Review -Plans, Specifications, and Estimates (PS&E) Plan Review -Final Office Review

Preliminary Plan and PS&E Reviews may be conducted either formally or informally:

- Informal reviews consist of interested parties submitting comments via email and no formal meeting is held.
- Formal reviews have a meeting time and place set aside for discussion and comments can be made either electronically beforehand or at the meeting itself. There are two methods of conducting a formal plan reviews:
  - 1. The first and preferred way is to set up VNNDOT (video conferencing network) meeting between the Central Office and the applicable District.
  - 2. The second option is to conduct an onsite review either near the project location, at the applicable District, or at the Central Office. This alternative should only be used for complex projects or projects in which site visits may be necessary. The designer should coordinate appropriate transportation to allow for proper input from the various members of the review team.

All projects, except for Preventive Maintenance Projects, should have a minimum of one plan review prior to the Final Office Review. This review typically would be a PS&E review.

For Preventive Maintenance and smaller scale projects, the requirements for plan reviews should be made on a case-by-case basis.

### I-07.02 Preliminary Plan Review

This review should be conducted at a time when the plans have progressed sufficiently, 25% to 50% complete, to allow for proper review of the following design features by the designer and the accompanying members of the review team. The intent of the Preliminary Plan Review is to insure all major changes are made at this stage.

- Horizontal and Vertical Alignments: The preliminary alignments should be established and a preliminary earthwork summary is available to allow the evaluation of the geometry, drainage, borrow requirements, etc. The earthwork summary should indicate end areas, volumes, and limits or tie points of the cut and fill slopes.
- Borrow: Special emphasis should be given to evaluating borrow requirements, identifying possible locations for sources of borrow, and optimizing utilization of material from the existing highway right of way.
- Access: The existing and future access needs should be evaluated. Access points should be established to the fullest extent possible, subject to concurrence by the Design Engineer and by the landowner, when contacted by a representative from the ETS Division Right of Way Services.
- Right of Way: The existing right of way and need for new right of way, permanent sight easements, permanent drainage easements, temporary construction easements, etc. should be evaluated.
- Utilities: An effort should be made to identify and locate those utilities within the project area prior to conducting this review. The type and location of the utilities should be evaluated and recommendations for the necessary adjustments determined. The designer should note any utilities not identified on the survey. If utilities are found in the field, the designer should coordinate additional surveying to update plans as necessary.
- Safety Improvements: The safety review should be evaluated to determine or verify any special conditions that may need to be addressed in the final design.
- Drainage Improvements: The drainage features should be evaluated to determine or verify any special conditions that may need to be addressed in the final design.
- The Bridge Division or lead structural designer will normally conduct a Type, Size, and Location (TS&L) inspection for the proposed structures located within the project limits. The TS&L review is discussed in Section V-02.06 of this manual.
- Constructability Issues: The design should be evaluated for any constructability issues or special conditions that may need to be addressed in the design, construction phasing, schedule, etc.
### **Coordination**

A Preliminary Plan Review Checklist is provided in Section III-02.

The Designer or Technical Support Contact assigned to the project will be responsible for all coordination required in scheduling, transportation, and notification of participants.

Review participants should be identified from the Plan Review Distribution List located at: <u>http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm</u>

The plans should be made available to all review participants a minimum of 7 calendar days prior to the date of the review. The plans shall be placed on the public ftp site following the procedure below:

- 1. Create a black and white .pdf file of the plans.
- Launch Internet Explorer, or Windows Explorer, and type "ftp://ftp.state.nd.us/public/PPR" in the address bar and press Enter.
- 3. The "Log On As" dialog box will appear after you press Enter. If the dialog box doesn't open, try typing in the ftp address again.
- 4. Contact the CADD Support Specialist or NDDOT Technical Support Contact for questions or password needed for the ftp site.
- 5. Create a new folder using the project number as the folder name, and place the .pdf file inside.
- 6. Email a link to the plans to the reviewers identified in the Plan Review Distribution List.

For consultant designed projects, the plans shall be placed on their assigned consultant ftp site, and the NDDOT Technical Support Contact will follow the procedure above.

The Designer will be responsible to record all comments, questions, and/or items requiring further study or resolution by preparing a Preliminary Plan Review comments memorandum. The Preliminary Plan Review comments memo will be placed in FileNet, and the FileNet link will be sent to everyone invited to the review as shown on the Plan Review Distribution List. All comments shall be responded to, and resolved to the fullest extent possible within the memo. Any issues not resolved between any division and/or district, or any issues that are considered a change in scope of work, or increased cost compared to the approved environmental document will be referred to the Director - Office of Project Development and Deputy Director for Engineering.

### I-07.03 Plans, Specifications, and Estimates (PS&E) Plan Review

This review should be conducted when the plans are 90% to 100% complete. This normally occurs approximately one month prior to the scheduled plan completion date, but can take place earlier if the plans are sufficiently complete. This review should provide for proper review of the design features and plan sheets by the designer and the accompanying members of the review team, and allow sufficient time for the Designer to make the necessary plan revisions.

All projects should have a PS&E Plan Review. Generally, all grading, urban, and nonpreventive maintenance projects will have formal review. Preventive maintenance projects would normally have an informal review. If there is any doubt as to the need for a formal or informal review, the Designer should contact the District Engineer for their recommendation.

A follow-up review will be conducted if more than one year has passed due to changes in the bid opening schedule.

This review is very important and should include all the major components of the plan sheets and project proposal as follows:

- Title Sheet
- Note Sheets
- Quantity Sheets
- Detail Sheets
- Typical Section Sheets
- Plan and Profile Sheets
- Work Zone Traffic Control Sheets
- Signing, Marking, Guardrail, Lighting, and Signal Sheets
- Structural Sheets
- Cross Section Sheets
- Special Provisions
- Cost Estimates
- Recommendations for contract completion date or guaranteed number of working days.

### **Coordination**

A PS&E Plan Review Checklist is provided in Section III-02.

The Designer or Technical Support Contact assigned to the project will be responsible for all coordination required in scheduling, transportation, and notification of participants.

Review participants should be identified from the Plan Review Distribution List located at: <u>http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm</u>

The plans should be made available to all review participants a minimum of 14 calendar days prior to the date of the review. The plans shall be placed on the public ftp site following the procedure below:

- 1. Create a black and white .pdf file of the plans.
- Launch Internet Explorer, or Windows Explorer, and type "ftp://ftp.state.nd.us/public/PS&E" in the address bar and press Enter.
- 3. The "Log On As" dialog box will appear after you press Enter. If the dialog box doesn't open, try typing in the ftp address again.
- 4. Contact the CADD Support Specialist or NDDOT Technical Support Contact for questions or Password needed for the ftp site.
- 5. Create a new folder using the project number as the folder name, and place the .pdf file inside.
- 6. Email a link to the plans to the reviewers identified in Appendix I-10A.

For consultant designed projects, the plans shall be placed on their assigned consultant ftp site, and the NDDOT Technical Support Contact will follow the procedure above.

The Designer will be responsible to record all comments, questions, and/or items requiring further study or resolution by preparing a PS&E comments memorandum. The PS&E comments memo will be placed in FileNet, and the FileNet link will be sent to everyone invited to the PS&E review as shown on the Plan Review Distribution List. All comments shall be responded to, and resolved to the fullest extent possible within the memo. Any issues not resolved between any division and/or district, or any issues that are considered a change in scope of work, or increased cost compared to the approved environmental document will be referred to the Director - Office of Project Development and Deputy Director for Engineering.

### I-07.04 Final Office Plan Review

The Final Office Plan Review should be conducted when the plans are 100% complete. A copy of the plans should be submitted 7 calendar days prior to the Final Office Plan Review date to provide for advance review of the plans. The final original sealed paper hard copy plans shall be brought to the Final Office Plan Review for signature, approval, and processing.

The Final Office Plan Review is conducted by the Design Program Manager and/or Design Engineer for all projects, except for Local Government and Preventive Maintenance projects. The Final Office Plan Review shall be conducted with the Director – Office of Project Development for all strategic projects. Review participants should be identified from the Plan Review Distribution List located at:

http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm

The Final Office Plan Review will not be conducted for Preventive Maintenance projects.

- The lead Designer and/or their supervisor shall schedule and attend the Final Office Plan Review for Design Division projects.
- The Technical Support Contact and Consultant shall schedule and attend the Final Office Plan Review for Consultant projects.
- The Technical Support Contact shall schedule and attend the Final Office Plan Review for District projects. The District shall attend if possible.

For Local Government projects, the Final Office Plan Review is conducted by the Director – Office of Project Development.

• The Technical Support Contact(s) and Consultant shall schedule and attend the Final Office Plan Review for Local Government projects.

The Final Office Plan Review Checklist shall be completed as much as possible by the designer prior to this meeting, and required to be brought to the Final Office Plan Review meeting for completion. The Final Office Plan Review Checklist is provided in Appendix III-01 C, or found on the Reference and Forms page of the Design Manual.

Special emphasis will be given, but not limited to, the following considerations:

- Review of PS&E Comments
- Plan Development Checklist
- Review of Environmental Document
- Conformance to NDDOT Specifications and Standards
- Quality of Construction
- Suggested Improvements to Design Features

The Final Office Plan Review may be followed up with a memorandum providing any findings of significance from the review. This report will be submitted to the Design Engineer and Director - Office of Project Development when the project plans are submitted for signature.

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### I-07.05 Plan Review and Design Development Checklists

The following checklists are provided in Section III-02:

- Plan Design and Development Checklist General
- Plan Design and Development Checklist Traffic Control Design (Signing, Pavement Marking, Guardrail, Lighting, Traffic Signals)
- Preliminary Plan Review Checklist
- PS&E Plan Review Checklist
- Final Office Plan Review Checklist Required, bring to the Final Office Plan Review.

### I-08.01 CADD Procedures

Design and plan preparation for Department construction projects is done with computer-aided design and drafting (CADD) procedures. The CADD Manual presents details on design and drafting procedures utilized by the department. The CADD Manual is available in electronic form on the web at <a href="http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm">http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm</a>, click "Chapter VI: CADD Manual". Parties outside the Department doing design work and plan preparation for NDDOT, should familiarize themselves with the procedures specified in the CADD Manual. The use of Microstation and Geopak systems is mandatory.

### I-08.02 Reproduction Procedures

Design sections routinely require copies of plans and documents for field reviews and PS&E inspections. If a nominal number of copies are needed, they are made on the copy machine located in the Design or Bridge Division. If higher numbers of copies are necessary, or if the plans have a large number of sheets, or if special printing methods are necessary, the copies generally are ordered from the Printing Section of the Information Technology Division.

The District offices will sometimes require larger sized prints of project cross sections, etc. These normally are printed on the plotters located in each District office.

### I-08.03 Final Plans Submittal

Final plans are typically generated by the Central Office, Districts, or Consultants. The lead divisions for Central Office plans are typically Design Division, Local Government Division, and Bridge Division. Sometimes other Divisions such as Materials and Research, ETS, and Maintenance are the lead.

### I-08.03.01 Central Office Plans

The lead designer is responsible for obtaining all sections of the plans including traffic safety, traffic control, roadway design, structural, etc. The lead designer will coordinate the plan preparation and will be responsible for assembling the final plans.

### **Original Hard Copy (Central Office)**

The original paper hard copy shall be sealed, signed, and dated by the lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All of the plan sheets shall be sealed, signed, and dated except for cross sections, table of contents, pit plats, and quantity sheets.

The title sheet of the plans will be sealed, signed, and dated by the respective Program Manager as the overall coordinator. The title sheet of the structural plans will be sealed, signed, and dated by the Bridge Engineer or the Assistant Bridge Engineer as the overall coordinator. In addition, the title sheet will also need to be signed by the Director of Office of Project Development (OPD) for Core projects, or signed by the respective Division Engineer for the OPD Director on non-Core projects. Core project plans also need to be signed by the District within the District Review box.

The cross sections for the original hard copy set should:

- Be included with the plans in one volume, if cross section are less than 25 sheets
- Be a separate volume if cross sections are greater than 25 sheets

The original paper hard copy of the final plans shall be submitted to the Programming Division by the lead designer as outlined below:

- 1. The lead designer shall 3-hole punch the original hard copy plans, attach them to folders with hardware, include the final Mainframe cost estimate, and place the highway number, beginning reference point, and project number/description sticker labels on the outside of the folders. The lead designer shall request the project number/description label to be made from their respective administrative assistant.
- 2. The lead designer shall then deliver the original hard copy plan set to Programming Division.
  - If a job is withdrawn from the bid opening, the lead designer will be responsible to obtain the plans back from Programming.
  - If a future bid opening is assigned, the lead designer shall retain the plans. The lead designer shall re-submit the plans to Programming near the time of the future bid opening.
  - If a future bid opening is not assigned, the lead designer shall give the plans to their respective administrative assistant. The administrative assistant shall file the plans with the Records Center. Once a future bid opening is assigned to the plans, the lead designer shall request the plans back from their administrative assistant. The lead designer shall re-submit the plans to Programming near the time of the future bid opening.
- 3. Programming will deliver the original hard copy plans that are bid to the Records Center to be permanently stored at the NDDOT Central Office.

### Electronic Plans (Central Office)

In addition to the original paper hard copy, the final plans shall be submitted electronically in the form of a .pdf file. The lead designer shall submit the electronic plans to Programming as follows:

- When Programming creates the bid opening list, Programming will also create a bid opening folder within O:\81 Special Projects\DIP PLANS. The lead designer shall place the electronic plans in O:\81 Special Projects\DIP PLANS by creating a "Job # Project #" folder within the existing bid opening folder created by Programming above. The lead designer shall email -Grp-DOT Bids Addenda when the electronic plans have been placed in the O:\81 Special Projects\DIP PLANS bid opening folder. This will notify Programming and Construction Services that the electronic plans have been submitted. Other Divisions may place documents within the folder such as soil data, SPs, Right-of-Way certifications, Utility certifications, environmental permits and plans, etc...
  - If the bid opening list has not yet been prepared by Programming, a bid opening folder will not exist within O:\81 Special Projects\DIP PLANS. The lead designer shall then instead place the electronic plans within O:\81 Special Projects\DIP PLANS\000 Plans Holding by creating a "PCN #" folder. If projects are tied, the folder name shall list the parent PCN first, and all tied PCNs after, separating by a coma. This folder will be used as a staging area for information needed to submit plans. The "PCN #" folder may be created by anyone needing to place documents by PCN.

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- If a job is withdrawn from the bid opening, Programming will be responsible to rename the folder to the "PCN #", and move the folder and all its contents to O:\81 Special Projects\DIP PLANS\000 Plans Holding.
- Once a future bid opening list is prepared by Programming, Programming will create a bid opening folder within O:\81 Special Projects\DIP PLANS. The lead designer shall then be responsible to move the "PCN #" folder and all its contents from O:\81 Special Projects\ DIP PLANS\000 Plans Holding to the appropriate bid opening folder within O:\81 Special Projects\DIP PLANS and rename the "PCN #"folder to the appropriate "Job # Project #". This will ensure that all the documents move with the project to the new bid opening.
- Plan changes can be done at any time while the plans are in the folders described above. The designer shall email -Grp-DOT Bids Addenda if any plan changes have been done. This will notify Programming and Construction Services that plan changes have been made.
- 2. When Programming prepares the project for bid opening, Programming will move the "Job # Project #" folder and all its contents from O:\81 Special Projects\DIP PLANS to the O:\81 Special Projects\DIP PLANS-Final. This folder is read-only access and plan changes cannot be made. If plan changes need to be made by the lead designer after the plans are read-only access, the lead designer needs to contact Programming to determine if the change can be made, or if an addendum will need to be submitted. See Section I-09.01 of this manual for more information on plan addendums.
- 3. Programming places the electronic plans on the Bid Opening Plans and Proposals website for bidding.

The Electronic Plan Sheet Submittal Checklist shall be completed, signed, and placed in FileNet by the lead designer before the final electronic plans are placed in **O:\81 Special Projects\DIP PLANS.** The Electronic Plan Sheet Submittal Checklist is explained in more detail in Section I-08.04 of this section.

The electronic plan set shall have the seal, signature, and date replaced with the electronic distribution statement, "This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE-\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation."

A copy of the plans may be distributed in two methods:

- 1. All paper or hard copy reproductions of the plans that are distributed shall contain a reproduction of the seal, signature and date.
- 2. The plans may also be distributed electronically. If the plans are to be distributed electronically, the plans must contain the electronic distribution statement as described above.

### Proposal Package and Supplemental Information (Central Office)

In addition to the electronic plans, there are other electronic files that need to be submitted to Programming Division to build the Proposal Package and Supplemental Information links on the Bid Opening Plans and Proposals website for potential bidders:

1. <u>Proposal Package items:</u> The following items shall be placed in **O:\81 Special Projects\DIP PLANS** by the responsible party to be included with the proposal package.

Electronic File	<b>Responsible Party</b>
SFN 18878 Determination and	Design on Pridge Division
Approval for CATEX	Design of Bridge Division
	Programming Division and
Pit Lists	Materials & Research
	Division
SP's	ETS and/or Design Division
Permits	ETS Division
SFN 9683 Borrow Area Lists	Design Division
with COA's attached	Design Division

 Supplemental Information items: The following items shall be placed in O:\81 Special Projects\DIP PLANS by the responsible party to be included with the supplemental information. All file names must have the prefix of the "Project #" and a suffix of "-zz".

Electronic File Responsible Party		File Name	
Design Data*	Design Division	Project # Design Data-zz.pdf	
Lincer Sails Bonort	Materials & Research	Project # Linear Soils Report-	
Linear Sons Report	Division	zz.pdf	
Domony Investigation Depart	Materials & Research	Project # Borrow	
Borrow Investigation Report	Division	Investigation Report-zz.pdf	
Evisting Structure Dlang	Dridge Division	Project # Existing Structure	
Existing Structure Plans	Bridge Division	Plans-zz.pdf	
Litility Conflict Plans	Design Division - Utility	Project # Utility Conflict	
Ounty Connet Plans	Engineer	Plans-zz.pdf	

\*See section 4.7.7 of CADD Manual for additional details.

### I-08.03.02 District Plans

The District lead project designer is responsible for obtaining all sections of the plans including traffic safety, traffic control, roadway design, structural, etc. The District lead designer will coordinate the plan preparation and will be responsible for assembling the final plans.

### **Original Hard Copy (District)**

The original paper hard copy shall be sealed, signed, and dated by the lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All of the plan sheets shall be sealed, signed, and dated except cross sections, table of contents, pit plats, and quantity sheets.

The title sheet of the plans will be sealed, signed, and dated by the District Engineer or Assistant District Engineer as the overall coordinator. In addition, the title sheet will also need to be signed by the Director of Office of Project Development (OPD) for Core projects, or signed by the Design Engineer for the OPD Director on non-Core projects. For Preventive Maintenance projects, the District Engineer will assume responsibility and sign the plans in place of the Design Engineer.

The cross sections for the original hard copy set should:

- Be included with the plans in one volume, if cross section are less than 25 sheets
- Be a separate volume if cross sections are greater than 25 sheets

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The original paper hard copy of the final plans shall be submitted to the Technical Support Contact for review and processing two weeks prior to the plan completion date. The original paper hard copy final plans are submitted to the Programming Division by the Technical Support Contact. The Technical Support Contact shall follow the lead designer procedures in Section I-08.03.01 above.

### Electronic Plans (District)

In addition to the original paper hard copy, the final plans shall be submitted electronically in the form of a .pdf file and placed in **O:\81 Special Projects\DIP PLANS\DISTRICT PLANS** by the District designer. The District designer shall email the Technical Support Contact that the electronic plans have been submitted. The Technical Support Contact shall submit the electronic plans to Programming, and follow the lead designer procedures in Section I-08.03.01 above.

The Electronic Plan Sheet Submittal Checklist shall be completed, signed, and placed in FileNet by the District designer before the final electronic plans are submitted to the Technical Support Contact and placed in O:\81 Special Projects\DIP PLANS\DISTRICT PLANS. The Electronic Plan Sheet Submittal Checklist is explained in more detail in Section I-08.04.

The electronic plan set shall have the seal, signature, and date replaced with the electronic distribution statement, "This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE-\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation."

A copy of the plans may be distributed in two methods:

- 1. All paper or hard copy reproductions of the plans that are distributed shall contain a reproduction of the seal, signature and date.
- 2. The plans may also be distributed electronically. If the plans are to be distributed electronically, the plans must contain the electronic distribution statement as described above.

### Proposal Package and Supplemental Information (District)

In addition to the electronic plans, there are other electronic files that need to be submitted to Programming Division to build the Proposal Package and Supplemental Information links on the Bid Opening Plans and Proposals website for potential bidders:

 <u>Proposal Package items:</u> The following items shall be placed in O:\81 Special Projects\DIP PLANS by the responsible party to be included with the proposal package. The District is responsible for placing files in the appropriate folder in O:\81 Special Projects\DIP PLANS\DISTRICT PLANS where "Technical Support" is listed as the responsible party.

Electronic File	<b>Responsible Party</b>
SFN 18878 Determination and Approval for CATEX	Technical Support
Pit Lists	Programming Division and Materials & Research Division
SP's	ETS and/or Technical Support
Permits	ETS Division
Borrow Area Lists with COA's	Technical Support

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 Supplemental Information items: The following items shall be placed in O:\81 Special Projects\DIP PLANS by the responsible party to be included with the supplemental information. All file names must have the prefix of the "Project #" and a suffix of "-zz". The District is responsible for placing files in the appropriate folder in O:\81 Special Projects\DIP PLANS\DISTRICT PLANS where "Technical Support" is listed as the responsible party.

Electronic File	<b>Responsible Party</b>	File Name
Design Data*	Technical Support	Project # Design Data-zz.pdf
Linear Soils Report	Technical Support	Project # Linear Soils Report-zz.pdf
Domary Investigation Depart	Tashnisal Sympost	Project # Borrow Investigation
Borrow Investigation Report	Technical Support	Report-zz.pdf
Existing Structure Dlang	Tashnigal Sunnant	Project # Existing Structure Plans-
Existing Structure Flans	Technical Support	zz.pdf
Utility Conflict Plans	Design Division	Project # Utility Conflict Plans-z.pdf

\*See section 4.7.7 of CADD Manual for additional details.

### I-08.03.03 Consultant Plans

The Consultant will coordinate and assemble the final plans. This may require getting sections of the plans that are not included in their contract, such as structure plans or guardrail plans, from the Technical Support Contact and assembling all the sections into one plan set.

\*Consultant plans may only have the Consultant company/firm name located on the Title Sheet of the plans as follows:

- Located in the lower right portion of the title sheet, outside of the sheet border.
- Title Sheet of plans only, not to be displayed on other plan sheets.
- Text of company/firm name to be displayed only, no company logos.

### **Original Hard Copy (Consultant)**

The original paper hard copy shall be sealed, signed, and dated by the Consultant lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All plan sheets shall be sealed, signed, and dated by the Consultant except for the cross sections, table of contents, pit plats, quantity sheets, environmental commitments, and plans prepared by the NDDOT.

The title sheet of the plans will be sealed, signed, and dated by the Consultant as the overall coordinator. In addition, the title sheet will also need to be signed by the Director of Office of Project Development (OPD) for Local Government Division or strategic projects, or signed by the respective Division Engineer for the OPD Director on non-strategic projects. Strategic plans also need to be signed by the District within the District Review box.

If the plan set contains cross sections the original hard set should:

- Be placed in the plans if less than 25 sheets
- Be a separate volume if greater than 25 sheets

The Consultant shall submit the original paper hard copy final plans to the Technical Support Contact. The original paper hard copy final plans are submitted to the Programming Division by the Technical Support Contact. The Technical Support Contact shall follow the lead designer procedures in Section I-08.03.01 above.

### Electronic Plans (Consultant)

In addition to the original paper hard copy, the Consultant shall submit the final plans electronically to the Technical Support Contact in the form of a .pdf file. The Technical Support Contact shall submit the electronic plans to Programming, and follow the lead designer procedures in Section I-08.03.01 above.

The Electronic Plan Sheet Submittal Checklist shall be completed and signed by the Consultant and sent to the Technical Support Contact with the final electronic plans. The Technical Support Contact will place the Electronic Plan Sheet Submittal Checklist in FileNet. The Electronic Plan Sheet Submittal Checklist is explained in more detail in Section I-08.04.

The electronic plan set shall have the seal, signature, and date replaced with the electronic distribution statement, "This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE-\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation."

A copy of the plans may be distributed in two methods:

1. All paper or hard copy reproductions of the plans that are distributed shall contain a

reproduction of the seal, signature and date.

2. The plans may also be distributed electronically. If the plans are to be distributed electronically, the plans must contain the electronic distribution statement as described above.

### Proposal Package and Supplemental Information (Consultant)

In addition to the electronic plans, there are other electronic files that need to be submitted to Programming Division to build the Proposal Package and Supplemental Information links on the Bid Opening Plans and Proposals website for potential bidders:

 <u>Proposal Package items</u>: The following items shall be placed in O:\81 Special Projects\DIP PLANS by the responsible party to be included with the proposal package. The Consultant is responsible for supplying the Technical Support contact with files where "Technical Support" is listed as the responsible party.

Electronic File	<b>Responsible Party</b>
SFN 18878 Determination and	Technical Support
Approval for CATEX	11
	Programming Division and
Pit Lists	Materials & Research
	Division
SP's	ETS and/or Technical Support
Permits	ETS Division
SFN 9683 Borrow Area Lists	Technical Support
with COA's attached	

 Supplemental Information items: The following items shall be placed in O:\81 Special Projects\DIP PLANS by the responsible party to be included with the supplemental information. All file names must have the prefix of the "Project #" and a suffix of "-zz". The Consultant is responsible for supplying the Technical Support contact with files where "Technical Support" is listed as the responsible party.

Electronic File	<b>Responsible Party</b>	File Name
Design Data*	Technical Support	Project # Design Data-zz.pdf
Linear Soils Report	Technical Support	Project # Linear Soils Report-zz.pdf
Borrow Investigation Report	Technical Support	Project # Borrow Investigation Report- zz.pdf
Existing Structure Plans	Technical Support	Project # Existing Structure Plans-zz.pdf
Utility Conflict Plans	Technical Support	Project # Utility Conflict Plans-zz.pdf

\*See section 4.7.7 of CADD Manual for additional details for Supplemental Design Data.

### I-08.04 Electronic Plan Sheet Submittal Checklist

An Electronic Plan Sheet Submittal Checklist is required to ensure consistency with electronic plans. The Electronic Plan Sheet Submittal Checklist is located on the web at: <a href="http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm">http://www.dot.nd.gov/manuals/design/designmanual/designmanual.htm</a> within the "Reference and Forms" page under the "Miscellaneous Sheets" table.

The Electronic Plan Sheet Submittal Checklist shall be completed and placed in FileNet before the final electronic plans are placed in the proper Bid Opening Folder on the O:\81 Special Projects\DIP PLANS.

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The Electronic Plan Sheet Submittal Checklist shall be completed as follows:

• Designer

The Designer shall first review the final electronic plan sheets accordingly with the Electronic Plan Sheet Submittal Checklist. The Designer shall check all items on the checklist and sign on the Designer signature line.

• Supervisor

After the Designer has completed and signed the checklist, the Designer shall submit the Electronic Plan Sheet Submittal Checklist to their supervisor. The supervisor will then review the final electronic plan sheets accordingly with the Electronic Plan Sheet Submittal Checklist. The supervisor shall check all items on the checklist and sign on the Supervisor signature line.

### I-08.05 Standard Drawings

The Standard Drawings are an approved set of drawings showing standard details and materials of construction. The Design Division has the responsibility to monitor and maintain the department's standard drawings. The initiating Division Engineer (either Bridge, Design, or Materials and Research) will approve and sign the standard drawing.

The Standard Drawings<sup>1</sup> are located on the web at:

<u>http://www.dot.nd.gov/manuals/designmanual/designmanual.htm</u> under Standard Drawings. The standard drawings located on the department's website have the electronic distribution statement as described in section I-08.03 of the Design Manual.

<sup>&</sup>lt;sup>1</sup> The original hard copy of all standard drawings are sealed, signed and dated by the Design, Bridge, or Materials and Research Engineer, and are stored in the Traffic Safety Section of the Design Division.

### • Usage in Project Plan Sheets

A "List of Standard Drawings" which identifies the Standard Drawing number and description shall be placed in the Table of Contents. The designer should utilize the standard drawings from the website or users within the NDDOT can access them from R:\SUPPORT\DESSTD. These standard drawings should be added to the back of the plans prior to submitting the plans to the Programming Division or to the Technical Support Contact.

### • Revisions to Standard Drawings

Standard Drawing revisions must be approved and signed by the appropriate Division Engineer (either Bridge, Design, or Materials and Research). The Standard Drawings are then updated on the web. The latest revision made to any Standard Drawings is noted in the drawing's title block with a revision date and short description of the revision. All revisions to the Standard Drawings shall be documented in a cover memorandum and stored in FileNet.

### I-08.06 Electronic Plan Files and Working Files Distribution

The final electronic plan set is assembled and submitted as described above. Individual electronic plan files and working files shall be created, stored, or submitted as follows:

### • Central Office and District

Individual electronic plan files and working files used to create and assemble plans shall be created and stored on the NDDOT network R: Drive in the "Project" folder under the folder with the corresponding project number. District plan files that are created and stored outside of the network R: Drive must be copied/moved to the R: Drive no later than when the plans are approved and signed.

### Consultants

All individual electronic plan files and working files that are created outside of the NDDOT shall be submitted to the Technical Support Contact on a CD or through the consultant's designated ftp site. The Technical Support Contact will copy and place the files in the corresponding folders on the network R: Drive of the NDDOT. The CD will be stored in Records and Retention.

### I-08.07 Plan Files and Retention Policy

The original signed and sealed plan sheets are sent to the Records Center and microfilmed. When as-built drawings are received from the Districts responsible for constructing the projects, the as-built sheets are microfilmed and incorporated into the plans.

### I-09.01 Plan Revisions Prior To Bid Opening

- 1. Plan Revisions (prior to authorization) Revisions to plans after originals have been sent to Programming Division should be reviewed by the Design Engineer, appropriate Program Manager, Bridge Engineer, or District Engineer. The intent of this requirement is to provide a process which generates final plans by the plan completion date with an absolute minimum of changes. An emphasis on checking plans by designers and supervisors is therefore required.
- 2. Plan Revisions (after authorization prior to bid opening) Addendums to plans that have been submitted to contractors should be approved as in the paragraph below. It is the intention here that only necessary addendums are developed. Plan revisions that can be delayed should not be processed until after the bid opening date and should then be processed as ordinary change orders (see Section I-09.02). Procedures for developing an approved addendum are as follows:
  - a. The designer shall complete the "Plan Addendum Summary and Approval" form, and shall be submitted for signature. The "Plan Addendum Summary and Approval" form is located on the web on the Reference and Forms Page of the Design Manual at: <u>http://www.dot.nd.gov/manuals/design/designmanual/reference-forms.htm</u>
  - b. All plan sheets being revised should be annotated with the revision date and sealed, signed, and dated by the engineer who is in responsible charge.
  - c. The original sealed hard copy of the revised plan sheets and "Plan Addendum Summary and Approval" form go to Programming Division, as well as a revised cost estimate if there are any changes in the quantities or costs.
  - d. The revised plan sheets, cost estimate, and "Plan Addendum Summary and Approval" form shall also be submitted electronically in the form of .pdf files. The revised plan sheets .pdf file and cost estimate .pdf file shall both be placed separately under the appropriate bid opening folder in the O:\81 Special Projects\DIP PLANS by the designer. The designer shall email **-Grp-DOT Bids Addenda** the "Plan Addendum Summary and Approval" form to notify that the revised plan sheets and cost estimate have been placed in the respective O:\81 Special Projects\DIP PLANS bid opening folder. This will notify Programming and Construction Services that the electronic addendum has been completed.
  - e. If required by a RBSO plan, the designer should obtain verbal approval from FHWA for all addenda that are functional or major changes. Minor changes such as typos would not need approval from FHWA.
- 3. All efforts shall be made to coordinate addendums with Construction Services Division (and any other Division) prior to posting addendums, so that multiple plan revisions can be processed together, potentially reducing the number subsequent addendums for a project. Consultants shall complete the "Plan Addendum Summary and Approval" form for consultant projects. The "Plan Addendum Summary and Approval" form, original sealed hard copy plan sheets, cost estimates, as well as the electronic copies shall be submitted to the Technical Support Contact. The Technical Support Contact will follow procedures described above.

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### I-09.02 Construction Phase Revision after Bid Opening (Change Orders)

1. Construction phase revisions after the bid opening that are required as a result of plan error, plan omissions, changes in field conditions, contractor requests, etc. are typically handled through the change order process. These changes will be processed in three different manners, which are: (1) construction phase revisions that do not need to be sealed, signed and dated; (2) construction phase revisions that would be sealed, signed and dated by the project engineer; and (3) construction phase revisions that would need to be sealed, signed and dated by the original registrant. These construction phase revisions need to be evaluated to determine if they affect the functional design or are within the inherent variability from design in normal construction practices. The project engineer

will work with the Bridge, Design, or Materials and Research Division, and the District Engineer to determine which revisions will require sealing, signing and dating and who's seal would be required.

At a minimum, the change orders should include a description of why the change is being made and supporting data (i.e. pictures, sealed and signed plan sheet(s) or memorandum that has been sealed and signed).

a. Construction phase revisions that do not need to be sealed, signed or dated:

Some construction phase revisions that are administrative changes that do not affect either the design or physical features of the project do not need to be sealed, signed or dated. Examples of these changes would include changes regarding contract time, changes concerning partnering, changes resulting from differing funding sources, etc. These changes would be processed by the project engineer and would not need to be sealed, signed or dated.

b. Construction phase revisions that would be sealed, signed and dated by the project engineer:

Construction phase revisions that are within the inherent variability of normal construction practices and do not affect the functional design requirement, need to be sealed, signed and dated by the project engineer or their direct supervisor. Examples of these types of changes include changes in widths to bike paths or sidewalks, minor changes to pipe grades, minor changes to ditch width, minor changes to inslopes, etc. These revisions are sealed, signed and dated by the project engineer and included in the change order. The project engineer needs to revise the project "as built" drawings to ensure that all the project changes are reflected on the final "as built" plans.

c. Construction phase revisions that would need to be sealed, signed and dated by the original registrant:

Construction phase revisions that are outside of inherent variability or result in a functional design change need to be sealed, signed and dated by the original registrant, unless the original registrant is "not able." The original registrant is defined as being "not able" if they were a consultant who designed the project but their contractual responsibility has expired or if the original registrant is no longer employed with the DOT or the original registrant is temporarily unavailable. In either case, the DOT may authorize another duly registered individual to make the

revisions to sealed documents and to seal, sign and date the revisions. A duly registered individual making changes to final sealed documents must assume responsible charge and reseal the directly related final documents. Examples of these types of revisions include structural changes, lane width, shoulder width, specification changes, stopping sight distance, guardrail, superelevation, horizontal and vertical alignments, etc. The project engineer will prepare the change order and include the sealed, signed and dated revisions from the original registrant. The project engineer needs to also revise the project "as built" drawings to ensure that all the project changes are reflected on the final "as built" plans.

- 2. Plan revisions produced in Design or Bridge Division, or received from Materials and Research Division (plan revisions produced in Materials and Research are forwarded to the Design Division), should follow the procedure below:
  - a. Follow Chapter 7.4 (Change Orders) of the CADD Standards Manual.
  - b. Prepare a memo describing the changes for each sheet, including any changes in quantities (with estimated change in costs based on contract bid prices) to the Design or Bridge Engineer to review and initial.
  - c. Send an electronic copy of the revised plan sheets and memo to the District Office.
  - d. Send the original memo and the original sealed hard copy of the plan sheets to the Records Center as follows:
    - i. Staple and 3-hole punch the memo and plan sheets.
    - ii. Deliver to the Records Center (do not fold or bend).
    - iii. Records center will log the revisions and place the sheets with the original plans. When the Records Center is notified that the project has been finaled, the originals will be filmed.
- 3. Plan revisions that are produced by consultants should follow the procedure below:
  - a. Prepare a memo describing the changes for each sheet, including any changes in quantities (with estimated change in costs based on contract bid prices) for the Design or Bridge Engineer to review and initial.
  - b. The memo and original sealed hard copy plan sheets, as well as the electronic copies shall be submitted to the Technical Support Contact.
  - c. Technical Support Contact will follow the procedures outlined in above.

There are two types of notes used in each set of plans, Standard Notes and Plan Notes (also referred to as P-Notes). The Standard Notes and sample Plan Notes can be found on the web at <u>http://www.ugpti.org/dotsc/prepguide/index.php</u>.

All notes shall be written in the active voice, and also make use of the imperative mood. The active voice and imperative mood are described in more detail within section 101.01 of the Standard Specifications.

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All notes within Section 6 of the plans shall be listed in chronological order by the preceding specification number. Standard Notes shall be listed before Plan Notes within the same specification section.

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**I-10.01 Standard Notes** Standard Notes are general in nature and apply to multiple projects. Standard Notes are fixed notes, approved as written, and shall not be modified. The Standard Notes are identified in the following manner:

100-001 STANDARD NOTE: This is an example of a standard note format.

Where: 100 – designates the applicable section of the Standard Specifications. 001 – designates the assigned standard note number.

If a Standard Note must be modified for a specific reason, the note number shall be changed to represent a Plan Note.

#### I-10.02 Plan Notes

Plan Notes are specific in nature, and would apply primarily to a single project. Plan notes are identified in the following manner:

100-P01 PLAN NOTE: This is an example of a plan note format.

Where: 100 – designates the applicable section of the Standard Specifications.

- P designates the note as a plan note.
- 01 designates the note number.

Plan Notes should be numbered consecutively for all notes within a section of the Standard Specifications, and shall be placed after the Standard Notes within the section.

### I-10.03 Special Provisions

Special Provisions are additions and revisions to the Standard and Supplemental Specifications covering special conditions on an individual project. Special provisions address work items or project requirements that either vary significantly from, or are not addressed by, the Standard Specifications or Supplemental Specifications. A special provision should be used if the description of the work item is lengthy, complex, or requires research and approval from other divisions, districts, and/or agencies.

# \*Special Provisions that contain an engineering related work product must be PE stamped by a ND registered professional engineer on the first page.

Commonly used Special Provisions are listed on the PPG website under "Special Provisions." <u>http://www.ugpti.org/dotsc/prepguide/specprov/</u> The designer should determine which special provisions are applicable and necessary for the project.

The Special Provisions shall be listed on the Table of Contents plan sheet of the plans. The actual special provisions are not placed in the plans; rather, they are inserted into the Bidders Proposal by the Programming Division.

If the special provision is new, the designer will contact the Environmental & Transportation Services (ETS) for assistance in developing and researching the provision. ETS will assist the designer in the coordination, any necessary research, and with the preparation of a draft special provision. ETS will prepare the final draft of the special provision, coordinate FHWA approval,

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and assign a special provision number. *Each time a completed special provision is used, a new number must be assigned.* 

Written requests for special provisions from ETS are to be made no later than

- Two months before the PS&E meeting for TERO special provisions, and
- One month before the PS&E meeting for other special provisions,
- When requesting Intelligent Transportation Systems special provisions, include contacting the Maintenance Division.

Written requests for special provisions need to include the following:

- Project number;
- PCN;
- A brief description of the project;
- Plan completion date;
- Standard Specifications being bid under; and
- Bid opening date.

The designer will also address any conditions required in the special provision to complete the project as designed.

If the special provision is controversial, ETS will work with FHWA, NDDOT Specifications Committee, designer, appropriate divisions, and districts to resolve any differences.

When special provisions are new or controversial, requests should be submitted to ETS as early as possible during the project development to allow time for research, review, resolution, and approval by NDDOT and FHWA if applicable.

Special Provisions must be completed by ETS and submitted to the Programming Division by the plan completion date.

ETS will make distribution of the special provision to Contractors, FHWA, Districts, and Divisions.

### I-10.03.01 Tribal Employment Rights Ordinance (TERO) Special Provision

If the project is on, or partially on an Indian Reservation the designer should request a TERO Special Provision. On all North Dakota highway projects, including federal aid, state aid, and maintenance contracts, a Tribal Employment Rights Tax will be applied to the portions of the highway projects that are within the boundaries of the Indian Reservation. Additionally, hiring preference requirements apply to the entire project and all tied projects.

- 1. If TERO provisions apply, the designer will request in writing, a TERO Special Provision from ETS a minimum of 2 months prior to the PS&E meeting. Written requests for TERO provisions need to include the following:
  - a. Project number;
  - b. PCN;
  - c. A detailed description of the project;
  - d. Standard Specifications being bid under;
  - e. Bid opening date;
  - f. Plan completion date;

- g. Project location;
- h. Project length;
- i. Length on reservation; and
- j. Total estimated project cost.
- 2. If TERO provisions apply, the designer should request in writing, approval from the Office of Project Development or the District Engineer prior to tying the project to other local projects.

### INDIAN RESERVATION BOUNDARIES

Spirit Lake Nation				
Highway	District	<b>Reference Points</b>		Length
		Start	End	(Miles)
15	3	60.400	63.413	3.013
20	3	68.668	96.734	28.066
57	3	0.000	12.264	12.264
281	3	139.633	156.345	16.712

Standing Rock				
Highway	District	Reference I	<b>Reference Points</b>	
		Start	End	(Miles)
49	5	0.000	7.354	7.354
6	1	0.000	35.187	35.187
24	1	0.000	45.046	45.046
31	1	0.000	10.380	10.380
1806	1	31.190	33.966	2.776

Fort Berthold				
Highway	District	<b>Reference</b> P	<b>Reference Points</b>	
		Start	End	(Miles)
22	5	126.141	141.099	14.958
8	5	124.209	132.121	7.912
23	4	56.405	80.310	23.905
37	4	0.000	29.785	29.785
1804	4	192.158	213.688	21.530
8	7	132.121	133.661	1.540
22	7	141.099	156.051	14.952
23	7	35.6	56.405	20.805
73	7	7.31	11.332	4.022
1804	7	247.145	248.63	1.485

Turtle Mountain				
Highway	District	Reference Points Length		Length
		Start	End	(Miles)
281	3	234.422	247.177	12.755

### I-10.04 Incidental Work

Generally, all work and materials should be paid for separately; however, at times it may better suit the project to include some work and materials in the cost of associated items. Refer to Section I-11.09 of the Design Manual for guidance to determine when work items should be included as an indirect cost.

The designer must provide a plan note describing the items that are included in the indirect cost and list the specific contract item(s) in which to include the indirect costs. Include the following language when writing these types of plan notes: "Include the cost of [indirect items and work] in the contract unit price for [items included in the bid item list]."

### I-10.05 Salvaged Items

A goal of the North Dakota Department of Transportation is to incorporate existing resources into new projects whenever practicable. Resources that cannot be reincorporated into the new facility will be considered excess items. If, during project development, it is learned that excess items may have value to a participating agency for public use, then these excess materials, appurtenances, or equipment may be designated for salvage. A Plan Note describing the items to be salvaged is typically written. Examples include, but are not limited to traffic signals, signs, light standards, reclaimed pavement and attenuation devices.

Cities and Counties may take ownership of salvaged items provided they have signed a cost participation agreement. Priority of the receipt of salvaged items will be in the order of funding participation. If no participating agency requests a specific excess item for salvage the item shall become the property of the Contractor so any inherent value of the excess item can be reflected in the Contractor's bid.

Salvage that is designated for haul to a location outside of the project should be analyzed for cost effectiveness if the distance is greater than 25 miles from the exit of the project. The analysis should be submitted to the Engineer approving the plans. If salvage is to be specified, careful attention should be given to the contract provisions to ensure that the cost of the operation (i.e., removal or haul) is in the public interest and is a prudent expenditure of funds. This policy replaces the standard federal salvage credit policy as allowed by 49 CFR 18.36.

### I-10.06 Sole Source Items

Sole sources items are individual products that are specifically required within the plans. Sole source items are permitted through one of the following ways:

- <u>Public Interest Finding</u>: This is used when the DOT wants to justify one product over multiple products.
- <u>Certification</u>: This is used when there is only one known product available.

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• <u>Certification through synchronization</u>: Although there are multiple products available, one product is desired for reasons such as maintenance inventory. For example, a city may use a certain product exclusively and maintain an inventory of parts for that product, even though there are other products that do the same function.

### I-11.01 General

Cost estimates will be required during the various development phases of a project. These phases would typically be scoping, documented CatEx, preliminary design, and final design or engineer's estimate. On larger or complex projects, it may be necessary to develop some intermediate estimates.

Internal cost estimates are completed using the Roadway Inventory Management System -Highway Projects (RIMS#HP) program within the NDDOT Mainframe.

Consultants cost estimates (in excel format) shall be submitted to their Technical Support contact. For final engineer's estimates, the Technical Support contact will enter the consultant cost estimate into mainframe "RIMS#HP". All consultant cost estimates need to be free of spreadsheet rounding errors, and the bid items shall match the exact spec, code, and spelling (using all uppercase letters) of NDDOT bid items. The Spec and Code List available on the NDDOT website at: http://www.dot.nd.gov/business/consultants.htm#resources

If new bid items are needed, the consultant shall make a request to the Technical Support contact early as possible so that the Technical Support contact can coordinate the potential new bid item creation within mainframe "RIMS#HP".

The lead designer should coordinate or combine the cost estimates of each Design Section and Division or District into one overall final design cost estimate. The total estimated cost must also be summarized by project number and funding source (federal, state, and local participation).

The final design cost estimate should be a separate attachment to the project plans. The estimate must include the item specification and code, description, unit, quantity, unit price, and total unit cost for each item. The total estimated project cost must be tabulated and shown on the bottom of the page.

Early and preliminary cost estimates are a matter of open record, and it is often desirable to give the public a good handle of proposed project costs. However, the PS&E and final design engineer's cost estimate should be kept confidential until the contract has been bid.

### I-11.02 Existing Bid Items

The Spec, Code, Description, Unit, and Unit Prices for existing bid items can be identified from the following sources or references:

- "Spec and Code List"
- NDDOT Historical Fact Sheet Inquiry
- NDDOT Project Listing Fact Sheet Inquiry

The "Spec and Code List" can be found on the web in spreadsheet format at: http://www.dot.nd.gov/business/consultants.htm#resources

The NDDOT Historical Fact Sheet Inquiry and Project Listing Fact Sheet Inquiry are only available through the mainframe "RIMS#HP" program. I-11.03 Temporary Bid Items

Temporary Bid Items should only be used on conceptual estimates. Temporary bid items are intended to simplify and generalize groups of bid items or other items that are not directly bid; Page 134

such as, intersection improvements or right of way acquisition. When using a temporary bid item, the appropriate spec number should be based on the type of work or product and the code number is usually "9999"; for example, 720-9999 - RIGHT OF WAY - L SUM.

### I-11.04 New Bid Items

The Design Division – Traffic Section is responsible for maintaining the bid item data within Mainframe. If a new bid item is required, the designer should contact the Design Division – Traffic Section as early as possible to create the new bid item.

### I-11.05 Development of Unit Prices

The designer should review the unit prices for existing bid items, and shall develop a unit cost based on past similar type projects bid within similar regional areas and similar quantities.

- Past bid opening plans and proposals are available on the NDDOT website at: https://www.dot.nd.gov/business/bidinfo.htm
- Past abstracts of bids received are available on the NDDOT website at: https://www.dot.nd.gov/pacer/bidopenrptIndex.html

For new bid items, the designer should develop a unit cost based on estimated material, equipment, and labor costs.

### I-11.06 Contract Bond

The designer may have the mainframe "RIMS#HP" program automatically calculate the amount of contract bond based on a percentage of the contract amount. If the designer is preparing an estimate by hand, the following guidelines may be used to determine the amount of contract bond:

Total Contract Amount	Contract Bond Amount by % of Total Contract Amount	
0 to 100,000	2.0%	
100, 000 to 500,000	1.5%	
500,000 to 1,000,000	1.0%	
Over 1,000,000	0.75%	

### I-11.07 Mobilization

The designer may have the mainframe "RIMS#HP" program automatically calculate the amount of mobilization based on a percentage of the contract amount. The designer may also estimate the amount of mobilization by hand based on the types of work operations such as structural, bituminous paving, concrete paving, etc.

### I-11.08 Escrow of Bid Documentation

Consideration should be given to utilizing the Escrow of Bid Documentation for all projects greater than \$10 million, or for other projects with unique factors.

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If the project exceeds \$10 million, the designer and District will discuss and decide at the PS&E meeting on whether or not to utilize the Escrow of Bid Documentation bid item within the plans.

### I-11.09 Incidental Work

Generally, all work and materials should be paid for as separate bid items; however, some work and materials may be better suited to be made incidental to the bid item they are associated with. Typically, an incidental work item will have a very short time of completion and cost compared to the pay item it is attached to. Although incidental work items are allowed, the following guidelines should be used to determine when work items should NOT be incidental:

- The work item is not a specific component of another item that is estimated to exceed two thousand dollars.
- The work item quantity is variable and difficult to measure or determine by the contractor.
- When bid items and prices require evaluation.
- When the bid item is approved by the Director of Project Development.

The designer shall identify all incidental work within the plan notes, unless otherwise described with the Standard Specifications. The following guidelines should generally be followed regarding incidental items:

- Blotter Sand: Will be included in the price bid for other items on Seal Coat projects and on projects where the blotter material quantity is less than 300 tons (approximately). Blotter will be a pay item on all other projects.
- Tack Coat: Will be included in the price bid for HBP on projects where the HBP quantity is less than 1000 tons (approximately) or on urban concrete projects with HBP tie in. Tack will be a pay item on all other projects.
- Dowel Bars: Will be included in the price bid for the concrete on Reconstruction projects. •
- Dowel Bars: Will be a pay item on CPR and Dowel Bar Retrofit projects.
- Sawing and Sealing: Will be included in the price bid for concrete on Reconstruction • Proiects.
- Sawing and Sealing: Will be a pay item on CPR and Dowel Bar Retrofit Projects.
- Prime: Will be included in the price bid for HBP on projects where the HBP quantity is less than 1000 tons (approximately). Prime will be a pay item on all other projects.
- Testing: On QC/QA and HBP Superpave projects will be included in the price for the HBP.
- Asphalt Cement: Will be included in the price bid for the HBP on projects where the HBP quantity is less than 1000 tons (approximately). Asphalt Cement will be a pay item on all other projects.
- Flagging and Pilot Car: Will be included incidental for Chip Seal Coat projects only.
- Flagging and Pilot Car: Will be a separate pay item for Slurry Seals, Micro-Surfacing, and all paving projects.

### I-11.10 Engineering Cost

The designer should use 10% engineering plus 5% contingency (total of 15%) for documented CatEx and other preliminary reports.

The designer should use 10% engineering for final plan estimates.

### I-11.11 Project Prefixes

The project number typically begins with a prefix which categorizes the highway system, type of work, and NDDOT/FHWA interaction or involvement. Projects often have more than one prefix and project number. These prefixes may be used in conjunction as one project number, or they may be used separately as entirely different project numbers. Additionally, each project may have several funding sources (federal, state, and local participation) and different participation rates based on the prefixes and items of work. Examples of multiple project prefixes or numbers include: NH funds for a paving project combined with TE funds for a bikeway. Examples of multiple participation rates would include mainline paving versus service road paving and city funded only items.

The Programming Division or Local Government Division will determine the appropriate funding prefix and participation ratios based on NDDOT policy and guidelines. The designer should discuss and coordinate the project numbers, participation rates, and pay items with the respective Divisions for incorporation into the documented CatEx report, final plans, and cost participation and maintenance agreements (CPM).

### I-11.12 Sub Projects

Sub projects are created within "RIMS#HP" to be used when different funding and cost sharing splits occur. The quantities are entered into sub projects separately for bidding and cost sharing purposes. NDDOT Designers and Technical Support contacts shall request and coordinate sub projects for "RIMS#HP" cost estimates by contacting the Programming Division.

### I-11.13 Tied Projects

There are additional requirements that must be followed when two or more projects are tied together as a single job for bidding purposes:

- Any bid items common to two or more tied projects shall have the same unit costs.
- Contract Bond and Mobilization shall be split between all applicable projects on a pro-rated basis. For example, if the largest project contains 80% of the total project cost and there are two additional smaller tied projects, each worth 10%, the Contract Bond and Mobilization will be split between the three projects as 0.80 L Sum, 0.10 L Sum and 0.10 L Sum.
  - The above splitting requirement will be waived for any job where the child project(s) percentage is less than 5%, and those percentages will be added to the largest percentage project. For example, three tied projects with an 80%, 16% and a 4% split, the contract bond and mobilization for the child project less than 5% shall be added to the parent project numbers as 0.84 L Sum and 0.16 L Sum.

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Tied projects should be coordinated on a case by case basis to determine if any other bid • items such as field labs, field offices, traffic control, etc. should be allocated between the projects.

### I-11.14 Alternates and Options

Some projects will require the use of bidding alternates or options for specific items. It is important to know the difference between alternates and options, so projects can be bid appropriately:

- **Alternates:** Alternates indicate that the Contractor does not have to bid all alternatives. • The Contractor is able to bid only on the alternate they choose. Alternates should be labeled alphabetically (Alternate A, Alternate B, Alternate C). A common example would be bidding alternates for Interstate reconstruction outside shoulder pavement material (HBP Alternate or Concrete Alternate). However, inside interstate shoulders are not candidates for shoulder alternates.
- Options: Options indicate that the Contractor must bid all options so the Owner can consider the price when deciding to select an option that was bid. Options should be labeled with numbers (Option 1, Option 2, Option 3). A common example may be bidding pipe material options for storm sewer.

### I-11.15 Cost Estimate Review Team

Approximately one month prior to the Plan Complete Date for a given bid opening, the internal NDDOT Cost Estimate Review Team will meet and review the upcoming project's cost estimates. The Team will make recommendations on unit prices for various items on a project by project basis.

### I-11.16 Vertical Clearance "RIMS#HP"

When creating a new cost estimate for a project within mainframe "RIMS#HP", the designer or Technical Support contact must input any structures within the limits of the project into the "Edit Vertical Clearance" within the mainframe "RIMS#HP" cost estimate program. All structures must be entered using the corresponding Structure ID's that are available within "RIMS#HP". This will identify structures that need to have the vertical clearance surveyed during construction for actual structure vertical clearance when the project is completed.

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To comply with the North Dakota Century Code 43-19.1 and the North Dakota State Board of Registration for Professional Engineers and Land Surveyors relating to the regulation of professional engineers and professional land surveyors, all work products must follow:

### I-12.01 Final Engineering and Land Surveyor Work Products

Final engineering drawings, plans, specifications, maps, plats, reports, or other engineering or land surveying papers or documents involving the practice of professional engineering or land surveying, when presented to a client, contractor, subconsultant, any public agency, must be dated and bear the seals and signatures of the professional engineers or land surveyors by whom or under whose responsible charge they were prepared.

The original paper hard copy shall be sealed, signed, and dated by the lead designer or their direct supervisor with either the rubber stamp or crimp type. The signature and date shall be with blue ink to help distinguish the original from copies. All of the plan sheets shall be sealed, signed, and dated except for cross sections, table of contents, pit plats, quantity sheets, and environmental commitments. See Section I-08 for more information on final plans.

If distributed electronically, documents must contain the following electronic distribution statement:

• Professional Engineers:

This document was originally issued and sealed by pe\_name, Registration Number PE-pe\_#, on mm/dd/yy and the original document is stored at the North Dakota Department of Transportation

• Professional Land Surveyors:

"This document was originally issued and sealed by \_\_\_\_\_, Registration Number PE-\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the North Dakota Department of Transportation."

This document was originally issued and sealed by LS\_name, Registration Number LS LS\_#, on mm/dd/yy and the original document is stored at the County Recorder's Office

"This document was originally issued and sealed by \_\_\_\_\_, Registration Number LS \_\_\_\_\_, on \_\_\_\_\_ and the original document is stored at the County Recorder's Office."

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### Professional Engineers and Surveyors Revised 9/25/09

### I-12.02 Preliminary or Unfinished Engineering and Land Surveyor Work Products

Working or unfinished engineering drawings, plans, specification, maps, plats, reports, or other engineering or land surveying papers or documents involving the practice of professional engineering or land surveying must contain a statement to the effect that the work product is preliminary and not for construction, recording purposes, or implementation:

• Professional Engineers:

This document
is preliminary
and not for
construction or
(implementation
purposes.

*"This document is preliminary and not for construction or implementation purposes."* 

• Professional Land Surveyors:

1	
This d	ocument
is pre	liminary
and	not for
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*"This document is preliminary and not for recording or implementation purposes."* 

### 23 U.S.C. Section 407

### I-13.01 What is Section 407?

In 1987, Congress determined that Federal record keeping requirements were subjecting state transportation agencies to inappropriate litigation and stifling the open discussion of safety issues. Congress enacted 23 United States Code (U.S.C.) Section 409 to remedy these problems. Section 409 protects from discovery four broad categories of information collected or compiled for safety-related purposes.

Originally designated as U.S.C. Section 409, its designation is now 23 U.S.C. Section 407.

# See NDDOT policy LDRM1-1 "U.S.C. Section 407 Designation for application here: <u>23 U.S.C. Section 407 (NDDOT Policy LDRM1-1).</u>

### I-13.02 Why are we using a 407 stamp?

Until the state lost sovereign immunity the department did not have concerns about disclosure of these records since no one could bring action against us. Now that we are no longer protected by sovereign immunity, records are subject to discovery in litigation. It is important for the department to identify records that are protected by 23 U.S.C. Section 407.

Section 407 is not intended to prevent the release of all information about a project. Information about when, where, and how a project was constructed, commonly called as-built or as-planned documents can usually be released unless it is related to section 130, 144, or 152 of 23 U.S.C. However, information as to why it was built a certain way, why it was not built other ways, and safety studies of that project or other projects is protected.

The optimum time to determine if a document is 407 protected is at the time of creation and original filing. The DOT employee creating the records is the one most qualified to determine if the document is 407 protected. This is necessary due to the fact that persons creating the file may not be available years later when the copies of the file are requested.