

AESTHETICS

1A1 Assess Project Aesthetics

Overview

Determine the level of aesthetics to be incorporated into the project based on the project type and its physical and social setting.

References

UDOT Aesthetic Guidelines Manual
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY AESTHETICS ASSESSMENT FORM

A. Determine Level of Project Aesthetics

1. Follow UDOT Aesthetic Guidelines Manual to determine the appropriate level of project aesthetics based on the project type.

Projects that include Baseline Aesthetic Treatments may not need to complete tasks 2A1, 3A1 and 4A2. Coordinate with UDOT PM or LA.

If only UDOT Standard Roadside Vegetation will be incorporated as Final Stabilization, provide this work under activity 4A1.

B. Begin to Determine Project Aesthetic Budget

1. UDOT PM, LA and project to to determine the Project Aesthetics Budget if warranted, as per the UDOT Aesthetic Guidelines Manual.

Meet with local governments to determine their interest in participation.

The Region Director has final approval of the budget.

If required, Project Aesthetic Budget must be determined by 2A1.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Aesthetics/Landscaping Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

2A1 Develop Project Aesthetics Budget; Develop & Submit Project Aesthetic Plan

Overview

Determine the Project Aesthetics Budget, as per UDOT Aesthetic Guidelines Manual. Coordinate with other disciplines and participating LG(s) to incorporate features that enhance the project aesthetics. Develop Project Aesthetics Plan that may be submitted to the UDOT LA.

References

UDOT Aesthetic Guidelines Manual
UDOT Digital Delivery Website
UDOT CADD Standards
UDOT QC/QA Documentation

Deliverables & Tasks

I. PROJECT AESTHETICS PLAN

A. Establish Project Aesthetics Budget

1. Follow UDOT Aesthetic Guidelines Manual to determine the Project Aesthetic Budget. Coordinate with UDOT PM and LA for any project specific UDOT Aesthetic Goals before coordinating with local government.

B. Coordinate with Local Government

1. Determine if the participating local government recommends possible project aesthetics, including any landscape improvements.
Review with the LG the Project Aesthetic Budget, UDOT Aesthetic Guidelines Manual and when a LG suggested Aesthetic Enhancement may require betterment funded by the LG.
Clearly define the local government's long term responsibilities for maintenance and water supply of any landscape improvements and begin the process to obtain necessary agreement.
Obtain a letter of commitment for betterments from the local government.

C. Develop Project Aesthetics Plan

1. Follow UDOT Aesthetic Guidelines Manual to develop Project Aesthetics Plan.

D. Submit Project Aesthetics Plan

1. Submit Project Aesthetics Plan to UDOT LA for initial review.
2. Incorporated any UDOT LA comments to the Project Aesthetics Plan.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Aesthetics/Landscaping Design QC Checklist before distribution.
Provide the Checker with a check print of each deliverable and supporting documentation.
Complete all necessary corrections from the QC checklist.
Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3A1 Complete Project Aesthetics Plan

Overview

Follow UDOT Aesthetic Guidelines Manual and incorporate comments from UDOT PM or LA to prepare and submit the Project Aesthetics Plan to the UDOT Aesthetic Committee for review.

References

UDOT Aesthetic Guidelines Manual
UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT QC/QA Documentation

Deliverables & Tasks

I. PROJECT AESTHETICS PLAN

- A. Address UDOT LA Comments to Project Aesthetic Plans (2A1)
 - 1. Review and incorporate comments provided by the UDOT LA as part of 2A1.
 - Respond to each aesthetic related comment.
 - Make revisions to the Project Aesthetic Plan according to the responses.
 - Conduct QC Review and Verification of all comments.
 - 2. See UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.
- B. Submit Project Aesthetics Plan to UDOT Aesthetic Committee
 - 1. Submit updated Project Aesthetics Plan, including the Project Aesthetic Budget, to UDOT Aesthetic Committee for review, comment or approval.
 - 2. Follow UDOT Aesthetic Guidelines Manual to show project aesthetic treatments, including any landscape treatments.
- C. Review and Respond to UDOT Aesthetic Committee Comments, if required
 - 1. Provide any appropriate revisions or responses to the Project Aesthetic Plan as part of the UDOT Aesthetic Committee comments. Committee approval is required before Project Aesthetics Plan elements may be incorporated into project advertising documents.
 - 2. Follow the UDOT Aesthetic Guidelines Manual.

III. LANDSCAPE & IRRIGATION SHEETS (IF REQUIRED)

- A. Coordinate with Local Government for Landscape and Irrigation Design
 - 1. Coordinate with LG for any landscape plantings suggestions (plant species, size, quantity, etc.) and irrigation system design components.
 - 2. The irrigation system must be designed to satisfy LG standards, including preferred components.
 - May need to provide a Proprietary Letter for specific product brand name requirements.
- 3. UDOT LA must review and approve landscape plantings suggested by LG.

III. UDOT/LG LANDSCAPE AGREEMENTS INCLUDE ANY LG BETTERMENTS (IF REQUIRED)

- A. Obtain Signed Landscape Maintenance or Agreement(s) from Local Government
 - 1. Prepare and execute Master and Supplemental Landscape Maintenance agreements between UDOT and the local government that commits the local

government to long-term maintenance of project related aesthetic and landscape improvements.

2. Prepare and execute a final agreement for betterments the local government must provide to incorporate aesthetic enhancements including landscape improvements that exceed the Project Aesthetic Budget.

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Aesthetics/Landscaping Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4A1 Complete Erosion & Sediment Control Plans & Documents

Overview

Develop the project erosion and sediment control design, plans, and summaries. Prepare and assemble erosion and sediment control project documents including plans, special provisions, and Engineer's Estimate in Masterworks.

References

Masterworks

UDOT CADD Standards

AASHTO Construction Stormwater Field Guide

UDOT Plan Sheet Development Standards

UDOT Final Stabilization Measures

UDOT Digital Delivery Website

UDOT Specification Writer's Guide

UDOT Standard Drawings and Standard Specifications

UDOT Construction and Long-Term Stormwater Management Website

UDOT QC/QA Documentation

Deliverables & Tasks

I. EROSION & SEDIMENT CONTROL PLANS

A. Design Erosion and Sediment Control Elements

1. Design the location of erosion and sediment control elements using UDOT Standard Drawings and Standard Specifications, AASHTO Construction Stormwater Field Guide and UDOT Final Stabilization Measures to stabilize disturbed soil during construction and to capture and remove sediment from stormwater runoff.
2. Comply with UPDES requirements.
3. Evaluate the erosion and sediment control needs for all construction phases.
4. Select temporary erosion and sediment control measures.
5. Develop locations for erosion and sediment control best management practices (BMPs).
6. Use UDOT standard BMPs as much as possible.
7. Determine areas requiring seeding and develop appropriate seeding schedules based on soils, precipitation, and elevation.

B. Complete Erosion & Sediment Control Plan Sheets

1. Complete all erosion and sediment control plans according to UDOT standards.
 - Conform to UDOT CADD Standards
 - Conform to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website
 - General plan sheet requirements
2. Maintain CADD standards on each sheet such as line styles shown and cell scaling.
3. Include all necessary notes, callouts, and legends.
4. Identify and reference standard drawings and details.
5. Clearly organize all information.
6. Place a legend on each sheet.
7. Identify all temporary erosion and sediment control measures.

8. Include all necessary permanent stabilization requirements as indicated below and identify locations on erosion and sediment control plans or on other appropriate plans.

Topsoil - include depth (if different than depth noted in Section 02912), limits, and total area.

Seed - include limits (shown graphically and total area)

Hydraulic Erosion Control Products (Section 02911) - specify limits and each HECP type to be used.

Rolled Erosion Control Products (Section 02376) - specify limits and each RECP type to be used (shown graphically, total area and include installation detail)

Riprap lined ditches - include limits (shown graphically, total area and included installation detail)

9. Match all pay item callouts exactly with the cost estimate.

C. Complete Erosion and Sediment Control Detail Sheets

1. Develop all non-standard details necessary for construction and detail plan sheets.

Conform to UDOT Standards

UDOT CADD Standards

UDOT Digital Delivery Website

AASHTO Construction Stormwater Field Guide

UDOT Standard Drawings and Standard Specifications

Prepare detailed plan sheets in accordance with UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website.

General Plan Sheet Requirements

Detail Sheet Requirements

Include all necessary notes, callouts, dimensions, and symbols (use identifiable symbols and line styles)

D. Complete Erosion and Sediment Control Summary Sheets

1. Prepare summary sheets according to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website and Summary Sheet CADD Standards.

General Plan Sheet Requirements (Department or Region)

Summary Sheet Requirements

2. Use UDOT Excel spreadsheets and customize for the project.

Include all erosion and sediment control related pay items and necessary non-pay items

Include names, alignment designations, stations, offsets, units, and quantities

Show enough detail to support calculations

3. Use UDOT standard summary plan sheets.

Export all summaries from Excel to MicroStation

II. EROSION & SEDIMENT CONTROL COST ESTIMATE

A. Finalize Erosion and Sediment Control Cost Estimate

1. Update bid items and quantities

2. Update unit costs

B. Enter Erosion and Sediment Control Cost Estimate into Masterworks

III. EROSION & SEDIMENT CONTROL PROJECT DOCUMENTS

A. Prepare Erosion and Sediment Control Documents

1. Provide all special provisions required for project construction.

General Special Provisions

Project Specific Special Provisions

Use UDOT Specification Writer's Guide

Include local municipality specifications

2. Generate Measurement and Payment (M&P) for all bid items.

Develop M&P for all non-standard bid items

Use the current M&P

Include accurate description for all effort and materials required for construction

M&P pay items must match plan sheet pay items exactly

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Aesthetics/Landscaping Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4A2 Complete Aesthetics, Landscape & Irrigation Plans & Documents

Overview

Revise design based on Plan-in-Hand review and UDOT Aesthetic Committee (3A1) comments. Complete landscape and irrigation plans and documents. Finalize the aesthetic cost estimates.

References

UDOT Aesthetic Guidelines Manual
AASHTO Construction Stormwater Field Guide
UDOT Standard Drawings and Standard Specifications
Masterworks
UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Guidelines
UDOT Specification Writer's Guide
UDOT QC/QA Documentation

Deliverables & Tasks

I. LANDSCAPE & IRRIGATION PLAN SHEETS

- A. Address Plan-in-Hand Review and UDOT Aesthetic Committee Comments
 - 1. Complete the aesthetic Plan-in-Hand Review Comment Resolution Form.
Make revisions to the design and deliverables in accordance with the responses.
Conduct QC Review and Verification of all comments.
 - 2. Incorporate any UDOT Aesthetic Committee review comments into project plans.
 - 3. Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.
- B. Complete Plan Sheets
 - 1. Generate the landscape plan sheets following the current UDOT CADD Standards or the UDOT Digital Delivery Website and UDOT Plan Sheet Development Standards.
 - 2. Develop irrigation sheets for the project if applicable.
Combine sheets when appropriate.
 - 3. For all plan sheets:
 - Conform to UDOT Plan Sheet Development Standards General Plan Sheet Requirements.
 - Maintain CADD standards on each sheet such as line styles shown correctly and cell scaling.
 - Provide sheets at appropriate scale to clearly identify sheet symbols.
 - Include all necessary notes, callouts, and legends.
 - Identify and reference standard drawings and details.
 - Identify all proposed and existing facilities.
 - Clearly organize all information.
 - Match all pay item callouts exactly with the cost estimate.
 - Reference appropriate project files.
 - 4. For landscape plan sheets:
 - Identify surface treatments such as mulch, seeding, and pavement
 - Clearly label and provide a legend for landscape materials
 - Include Grading - contours, slopes, and drainage.

Include Planting plan - symbols.

Include Plant legends - symbol, plant identification key, botanical and common name, size, and quantity.

Include Topsoil depths.

Include seed schedule.

5. For irrigation plan sheets:

Clearly label and provide a legend for irrigation components:

NOTE: Irrigation system design and components must be designed and approved by LG.

Water point of connection - water meter, well, or tap and responsibility

Power point of connection - electrical meter or source and responsibility

Stop and waste valve

Backflow preventer

Filter and pressure reducer

Controller

Control valves - include valve number and flow rate

Mainline - include sizing

Laterals - include sizing

Sleeves - include sizing

Heads - include nozzle size and flow rate

Drip zones

Emitters and bubblers - include flow rate

Provide an irrigation legend - symbols, description, and quantity.

C. Complete Detail Sheets

1. Develop all non-standard details necessary for construction and detail plan sheets.

Conform to UDOT Standards

UDOT CADD Standards

AASHTO Construction Stormwater Field Guide

UDOT Standard Drawings and Standard Specifications

Prepare detail plan sheets according to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website

Conform to General Plan Sheet Requirements.

Conform to Detail Sheet Requirements.

Include all necessary notes, callouts, dimensions, and symbols.

Use identifiable symbols and line styles.

D. Complete Summary Sheets

1. Prepare summary sheets according to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website and Summary Sheet CADD Standards.

Conform to General Plan Sheet Requirements (Department or Region)

Conform to Summary Sheet Requirements

2. Use UDOT Excel spreadsheets and customize for the project.

Include all roadway/multimodal related pay items and necessary non-pay items

Include names, alignment designations, stations, offsets, units, and quantities

Show enough detail to support calculations

3. Use UDOT standard summary plan sheets.
Export all summaries from Excel to MicroStation

II. LANDSCAPE & IRRIGATION PLAN COST ESTIMATE

- A. Finalize Landscape and Irrigation Plan Cost Estimate
 1. Update bid items and quantities.
 2. Update unit costs.
- B. Enter Landscape and Irrigation Plan Cost Estimate into Masterworks

III. LANDSCAPE & IRRIGATION PLAN DOCUMENTS

- A. Prepare Landscape and Irrigation Plan Documents
 1. Provide all special provisions required for project construction.
 - General Special Provisions
 - Project Specific Special Provisions
 - Use UDOT Specification Writer's Guide
 - Include local municipality specifications
 2. Generate Measurement and Payment (M&P) for all bid items.
 - Develop M&P for all non-standard bid items
 - Use the current M&P
 - Include accurate description for all effort and materials required for construction
 - M&P pay items must match plan sheet pay items exactly

IV. QC DOCUMENTATION

- A. Perform QC Review
 1. Perform the QC Review following the UDOT QC/QA Procedures and the Aesthetics/Landscaping Design QC Checklist before distribution.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the QC checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

5A1 Prepare Stormwater Pollution Prevention Plan (SWPPP) for Construction

Overview

Projects that disturb 1 acre or more of land are required to prepare and implement a SWPPP. The UDOT preconstruction group or its consultant will prepare the SWPPP and provide it to the UDOT Region Stormwater Coordinator for review.

References

UDOT Storm Water Construction
UDOT SWPPP Preparation Training
UDOT QC/QA Documentation

Deliverables & Tasks

I. SWPPP

A. Prepare SWPPP

1. Follow UDOT's SWPPP Outline. Prepare the SWPPP and fill in the necessary information.

B. Submit SWPPP to Region Stormwater Coordinator for review

C. Revise SWPPP based on UDOT Region Stormwater Coordinator Review

1. Include any changes to the SWPPP as required by UDOT Region Stormwater Coordinator comments.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT SWPPP Review Checklist and Region Stormwater Coordinator Review Comments.

Provide the Region Stormwater Coordinator with a revised SWPPP.

Complete all necessary corrections.

Upload all QC documentation into ProjectWise and attribute it correctly before advertisement.

SURVEY/MAPPING

1B1 Develop Base Mapping/Existing Surface

Overview

Obtain base mapping and topography for the entire project area.

References

Geo-Referencing MicroStation Seed file DTY File.pdf

UDOT CADD Standards

UDOT Survey & Geomatics Standards

UDOT Plan Sheet Development Standards

UDOT Digital Delivery Website

UDOT QC/QA Documentation

Deliverables & Tasks

I. SURVEY CONTROL SHEET (INCLUDES .DGN AND .PDF FILES)

A. Establish Survey Control

1. Establish Survey control (basis of bearing) using the latest National Geodetic Survey datum and State Plane Coordinate System as defined in the UDOT Survey & Geomatics Standards. As a minimum, horizontal coordinates should be carried out to .01 foot, unless greater accuracies are specified in the project's requirements.

Determine the type of survey based on the current UDOT Survey & Geomatics Standards, and project requirements as established at preliminary meeting with consultant surveyor, the region surveyor, the project manager, and design lead.

The basis for the survey should include the following as determined in the scope of work:

- Section Corners
- Existing ROW Markers
- USGS Monuments
- State Plane Coordinate System
- Local Survey Monuments
- Project Specific Control Monuments
- Latitude, Longitude, and Height
- Project Coordinates
- Section, Township, and Range
- Description of found Monuments

Control points need to have northing, easting, and elevation with equivalents in the State Plane Coordinate System.

If appropriate, include a paragraph describing the project parameters or the basis of bearing with primary control monuments.

Identify the bearing and distance between found & calculated section corners.

Description of how calculated section corners were re-established.

Clearly identify the units and the level of accuracy.

B. Establish Geo-referenced Seed File (.dgn)

1. Develop project specific geographic coordinate system and create a project geo-referenced seed file. Perform all work in MicroStation and according to UDOT CADD Standards.

C. Complete Survey Control Plan Sheets

1. Conform to UDOT CADD Standards, UDOT Plan Sheet Development Standards, UDOT Digital Delivery Website and UDOT Survey & Geomatics Standards to complete the Survey Control Plan Sheet(s).
2. The Control Summary Sheet shall be complete and delivered together with the extopo.dgn deliverable, including certification by a Utah Professional Land Surveyor.
3. The sheet will be delivered to the Region Surveyor for a quality assurance check.

II. BASE MAPPING (INCLUDES .EXTOPO FILE)

A. Perform Topographical Survey of Existing Features in Project Area

1. Prior to the base mapping survey being performed, a meeting between the consultant surveyor, region surveyor, the project manager, and design lead will be held in order to anticipate the needs for the project.
2. Some topics for the meeting could include but is not limited to:

- Schedule

- Survey needs

- Recommended type of survey method

- Accuracy requirements based on project type. (e.g. Machine Control Guidance, 3D Engineered Models, Pavement, Structures, etc.)

- Project Definition Document Discussion

- Extents of project survey

- Features needed for survey

- Other needs determined by the project manager, designer, or surveyor

- Past projects with developed control systems

- Utility locating

- UAS mapping

3. Potential Contacts:

- Federal Agencies/Bureau of Land Management/Forest Service/National Park Service/Bureau of Reclamation/U.S. Geological Survey/Department of Defense/Bureau of Indian Affairs

 - Permission to Enter

 - Survey Markers

- UDOT Permits Officer

 - Permission to Enter

 - Obtain Encroachment Permit

- UDOT Region ROW Engineer

 - Survey Control

- Local Governments

 - Permission to enter

 - Survey Control

- State Land Board

 - Permission to enter

- School & Institutional Trust Land Administrations (SITLA)

 - Permission to enter

- Indian Nations

 - Permission to enter

- Railroads/Transitways

 - Permission to enter

Private Property Owners

Permission to enter

4. Provide a text .csv file that matches the base mapping, including survey point numbers, northing and easting coordinates, elevations, and descriptions.
5. Provide a geo-referenced MicroStation file with survey point numbers, elevations, and descriptions displayed.
6. Provide a copy of all field notes made during the survey.
7. Perform all work according to UDOT CADD Standards.

B. Develop Base Mapping

1. Perform all work in a geo-referenced Bentley Open Roads file and according to UDOT CADD Standards and UDOT Survey & Geomatics Standards.

C. Develop DTM of the Existing Surface

1. Perform all work in Bentley Open Roads according to UDOT CADD Standards and UDOT Survey & Geomatics Standards.

III. ADDITIONAL BASE MAPPING

A. Determine Extent of Additional Surveying Needs

1. Coordinate with project team members to determine additional surveying needs.

B. Develop Additional Base Mapping and DTM

1. Revise or provide additional base mapping and DTM.

IV. ORIGINAL FIELD DATA

A. Provide Original Field Data

1. Provide all data in accordance to UDOT Survey & Geomatics Standards Manual.
2. Provide .CSV point list file and level notes.

B. Provide UAS Raw Data (if required)

1. Provide all raw photos taken from the UAV.
2. Provide a .csv file containing the Northing, Easting and Elevation of all Ground Control Points used for the UAS 3D model.

V. QC DOCUMENTATION

A. Perform the QC Review following the UDOT QC/QA Procedures and the Survey/Mapping QC Checklist before distribution.

1. Provide a certification from the Licensed Land Surveyor
2. Complete all necessary corrections from the 1B1 QC checklist.
3. Upload all QC documentation, including completed checklist and required signed certification into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

ITS

1C1 Assess Intelligent Transportation Systems (ITS) Needs

Overview

Coordinate with the ITS Project Manager assigned to your Region and fill out the UDOT Operations Readiness Review form to ensure proper review and inclusion of ITS and other operational needs within your project. The references listed below will help in this process and in designing ITS elements in your project.

References

Operations Readiness Review Form
UDOT ITS Design Manual
ITS Master Plan
UDOT Fiber Map
UDOT QC/QA Documentation

Deliverables & Tasks

I. OPERATIONS READINESS REVIEW FORM

A. Complete Operations Readiness Review Form

1. Coordinate with the ITS Project Manager assigned to your Region to complete the Operations Readiness Review form and determine the scope for ITS and other operational needs in your project.
2. As part of the Operations Readiness Review form completion, the ITS Project Manager assigned to your Region will coordinate with the various teams within the Traffic Management Division (TMD) on requirements for handling of existing ITS devices, addressing new ITS device needs, and any other requirements or recommendations related to ITS for the project.
3. Coordination with Region and Central Traffic & Safety teams may be required to determine other operational needs as outlined in the Operations Readiness Review form.

B. Provide Operations Readiness Review Form to Design Leader & Project Manager

1. If additional funding is required to include ITS and/or other operational needs, coordinate with your Region Program Manager, and Region Leadership as needed.

C. Estimate ITS Improvements Cost

1. Once final scoping for ITS is determined after filling out the Operations Readiness Review form, estimate the costs of proposed ITS improvements.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the ITS Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3C1 Develop ITS Components Design

Overview

Refine the ITS device locations and preliminary ITS Cost Estimate determined in the 1C1 phase of the PDN.

References

UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT ITS Design Manual
UDOT Standard Drawings
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY ITS PLAN SHEETS

A. Identify Locations of Device Placement

1. Identify all ITS device locations and connections. Coordinate with the ITS Project Manager to meet all TMD requirements.
2. Possible elements to include in this summary include the following:

Fiber Optic - Conduit or New Network Infrastructure

The ITS Project Manager assigned to your Region will coordinate with the TMD Fiber Team to:

- Identify connection locations
- Identify size and number of ducts
- Identify strand count

Traffic Signal Interconnect

Coordinate with the Region Traffic Signal Engineer
Identify each device as wireless or fiber optic

CCTV Camera

For Signal Operations, coordinate with the TMD Signal Systems Engineer

For Freeway Operations, coordinate with the ITS Project Manager assigned to your Region who will coordinate with the TMD Traffic Operations Engineer, ITS Maintenance, and the Region Traffic Operations Engineer to:

- Determine location, height, and verify line of sight
- Identify static and lowering poles
- Ensure that a CCTV camera is placed to read each Variable Message Sign (VMS)

Road Weather Information System (RWIS)

Coordinate with the ITS Project Manager assigned to your Region who will coordinate the TMD Weather Team

Variable Message Sign (VMS)

Coordinate with the ITS Project Manager assigned to your Region who will coordinate with the TMD Traffic Operations Engineer and Region Traffic Operations Engineer to:

- Meet sight distance requirements
- Identify the type of VMS for each location
- Identify structure type for each sign

Place ITS cabinet in view of the VMS message

Verify each VMS is visible by a CCTV camera

Ramp Metering

Coordinate with the ITS Project Manager assigned to your Region who will coordinate with the Region Traffic Operations Engineer and TMD Freeway Operations Manager to:

Evaluate vehicle storage length and number of lanes for each location

Evaluate acceleration lanes for each location

Evaluate locations for advanced warning devices

Determine mainline and ramp vehicle detection needs

Traffic Monitoring Station (TMS)

Coordinate with the ITS Project Manager assigned to your Region who will coordinate with the TMD Freeway Operations Manager to:

Determine TMS needs and device locations

Coordinate with Systems Planning and Programming to consolidate/supplement the CCS system with the TMS system

Continuous Count Station (CCS)

Coordinate with Systems Planning and Programming

Identify existing locations

Plan for how to keep existing locations in operation during construction

Identify new locations

Connected and Automated Vehicle (CAV) Infrastructure

Coordinate with the ITS Project Manager assigned to your Region who will coordinate with the TMD Transportation Technology team to determine CAV infrastructure needs.

Other ITS/Electrical/Electronic Devices and Infrastructure Not Specifically Identified in this Document

Coordinate with the ITS Project Manager assigned to your Region who will coordinate with all necessary parties associated with these devices and infrastructure.

3. Locate all facilities within the proposed ROW

Coordinate additional ROW with the ROW design team if necessary.

Coordinate all necessary easements, including aerial and temporary easements, with the ROW design team.

4. Locate all facilities outside the clear zone or use adequate protective measures

5. Identify access points and facilities for maintenance

6. Identify and propose mitigation for potential environmental conflicts

7. Locate the power source

Coordinate and receive approval from Region Utility Coordinator and Power Company for connection

8. Identify and propose mitigation for potential utility conflicts.

Place each device to minimize conflicts

Coordinate with utility team

9. Identify communications connection.

Identify each device as getting connected to fiber optic communications or wireless communications

Identify connection locations

Coordinate and receive approval from the Third Party Communications Company (if needed)

Coordinate with the ITS Project Manager assigned to your Region who will coordinate with and receive approval from the TMD Fiber Optic Communications Manager

B. Review Signal Design for Interconnect Needs

1. Review the device locations and needs

C. Prepare Preliminary ITS Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website to develop preliminary plan sheets for review.
2. These sheets are to provide a review of the proposed locations of all ITS devices.
3. All information on the sheets must go through the QC review procedure before distribution.
4. Combine plan sheets with other designs when appropriate.
Conform to General Plan Sheet Requirements of the UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website.
Follow and maintain CADD Standards on each sheet.
Include all information necessary for review such as callouts and notes.

II. REFINED ITS COST ESTIMATE

A. Develop ITS Cost Estimate

1. Compile ITS bid items and quantities
Use UDOT standard bid items
2. Develop unit costs for each item
Use appropriate resources for developing unit costs such as Masterworks and local contractors
Document unit cost development and assumptions
Account for project specific factors (see below)
3. Use lump sum pricing only when appropriate
Consider contractor risk due to unknown quantity
Consider difficulty in pricing per unit
Consider all materials and labor involved
4. Project Specific Unit Price Factors
Location
Specialty Equipment
Limitations of Operations
Quantity of Item
Current Bidding Environment
Availability of Materials
Familiarity of Process
Time of Year of Advertising
Risk to Contractor
Inflation
Construction Schedule
Constructability

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the ITS Design QC Checklist before distribution.

Provide Checker with check prints of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package

4C1 Complete ITS Plans & Documents

Overview

Complete the ITS plans and project documents and finalize the ITS cost estimate.

References

Masterworks

UDOT ITS Design Manual

UDOT CADD Standards

UDOT Signalized Intersection Design Manual

UDOT Plan Sheet Development Standards

UDOT Digital Delivery Website

UDOT Specification Writer's Guide

UDOT Standard Drawings and Standard Specifications

UDOT QC/QA Documentation

Deliverables & Tasks

I. ITS PLAN SHEETS

A. Address Plan-in-Hand Review Comments

1. Complete the ITS portions of the Plan-in-Hand Review Comment Resolution Form.

Respond to each ITS related comment.

Make revisions to the design and deliverables according to the responses.

Conduct QC Review and Verification of all comments.

2. See for more information about completing a Milestone Review Comment Resolution Form.

B. Revise ITS Design

1. Complete all ITS designs

Conform to UDOT CADD Standards and UDOT Standard Drawings.

Consult the UDOT ITS Design Manual for design recommendations.

Complete the electrical layout from the power supply

Locate all facilities within the proposed ROW.

Locate all facilities outside the clear zone or provide adequate protection.

Locate all facilities outside the snow plow zone or provide adequate protection.

Provide maintenance access points and infrastructure for all devices.

Obtain device manufacturer's specifications and stay within device performance limits.

Maintain line of sight for all wireless devices.

Coordinate the design with the ITS Project Manager assigned to your Region who will coordinate with the appropriate teams for all ITS design elements.

If Traffic Signal work is included in the project, coordinate this work and associated plans and other documentation with your Region's Signal Engineer.

C. Complete ITS Plan Sheets

1. Complete all ITS plan sheets according to UDOT and Federal standards.

Conform to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website

General plan sheet requirements

Maintain UDOT CADD Standards on each sheet such as line styles shown correctly and cell scaling

Conform to design guidelines in the ITS Design Manual

Identify all existing ITS facilities

- Call out ITS devices that will remain as “Keep in Service”

- Coordinate with the TMD through the ITS Project Manager assigned to your Region all disconnections and clearly state the requirements

Show cut/fill lines for mainline, ramps, and any side streets

Include all necessary notes, callouts, legends, etc.

- Call out splice points

- Provide general location of ITS devices

- Optimize the location of the CCTV camera

- Include street names on the mainline and cross streets

- Show the electrical layout from the power supply to the power disconnect

Show the communications layout from demarcation to the ITS device

- Include note to contact the TMD Fiber Optic Communications

- Manager to obtain splicing details 30 days before beginning splice work

Identify and reference standard drawings and details correctly

Clearly organize all information

Make all symbols and line styles identifiable

Match pay item callouts exactly with the cost estimate

Indicate and provide mitigation measures for all utility conflicts on both the plan and profile sheets

D. Complete ITS Detail Sheets

1. Complete all details necessary for construction of the project

- Conform to UDOT CADD Standards

- Prepare detail plan sheets following UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website

 - General Plan Sheet Requirements

 - Detail Sheet Requirements

 - Include all necessary notes, callouts, dimensions, and symbols

 - Use identifiable symbols and line styles

E. Complete ITS Summary Sheets

1. Prepare summary sheets according to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website and Summary Sheet CADD Standards

- General Plan Sheet Requirements

- Summary Sheet Requirements

2. Use UDOT Excel spreadsheets and customize for the project

- Include all roadway/multimodal related pay items and necessary non-pay items

- Include names, alignment designations, stations, offsets, units, and quantities

- Show enough detail to support calculations

3. Use UDOT standard summary plan sheets

- Export all summaries from Excel to MicroStation

II. ITS COST ESTIMATE

A. Finalize ITS Cost Estimate

1. Update ITS bid items and quantities
2. Update ITS unit costs (see 3C1)

B. Enter ITS Cost Estimate into Masterworks

III. ITS PROJECT DOCUMENTS

A. Prepare ITS Project Documents

1. Provide all special provisions required for project construction

General Special Provisions

Project Specific Special Provisions

Use UDOT Specification Writer's Guide

2. Use Masterworks to generate Measurement and Payment (M&P) for all bid items.

Develop M&P for all non-standard bid items

Include accurate description for all effort and materials required for construction.

M&P pay items must match plan sheet pay items exactly

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the ITS Design Checklist before distribution.

Provide Checker with check prints of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

ENVIRONMENTAL

1E1 Evaluate Environmental Needs

Overview

Evaluate the environmental needs for a project.

References

Environmental Assessment (EA)/Finding of No Significant Impact (FONSI), Environmental Impact Statement (EIS) / Record of Decision (ROD), or State Environmental Study (SES) Document

UDOT Environmental Process Manual of Instruction

UDOT QC/QA Documentation

If Local Government Project

The Local Government Representative accepts the commitments outlined in the environmental document.

Deliverables & Tasks

I. PROJECT COMMITMENT REPORT

A. Evaluate Environmental Needs

1. The Region Environmental Manager is responsible for determining if an environmental document has been completed for the project and proceeding with Option 1 or Option 2 outlined below:

Option 1: An environmental document has NOT been completed.

Review the proposed scope of work and identify potential resources and impacts.

Determine the appropriate environmental document type:

Categorical Exclusion, Documented Categorical Exclusion, or State Environmental Study.

For a Documented Categorical Exclusion, the Region Environmental Manager will coordinate with Central Environmental to prepare and obtain approval for a Class of Action letter.

Provide the Project Manager a recommended schedule for obtaining any necessary resource clearances and an estimated date for completion of the environmental document.

On ePM Screen 710, select the environmental document type.

Option 2: An environmental document has been completed.

If an environmental document has been completed following the EA/EIS Network, complete the environmental commitment review below and then proceed to Activity 3E1: Prepare/Obtain Permits.

B. Review Environmental Commitments

1. Review the completed environmental document (EA, EIS or SES) and the decision document (FONSI, ROD, or SES Approval).

2. Enter all commitments in a database or spreadsheet.

Refer to the Environmental Process Manual of Instruction for further information.

3. Inform the Project Manager of any critical commitments that have potential to affect the scope, schedule, or budget of the project.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Environmental Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

2E1 Prepare Environmental Document

Overview

Prepare the environmental document for the project.

References

UDOT Environmental Process Manual of Instruction
ePM Screen 770
CATX Delegation Page
UDOT NEPA Assignment Program QA/QC Plan
Public Involvement Resources and Templates
UDOT Title VI Program
Civil Rights and Title VI Checklist and Summary
Civil Rights and Title VI Project Evaluation
UDOT Public Meeting Calendar
UDOT QC/QA Documentation

Deliverables & Tasks

I. ENVIRONMENTAL RESOURCE TECHNICAL REPORTS

A. Perform Resource Impact Analysis

1. Prepare a fieldwork authorization form and submit it to the appropriate UDOT environmental staff for review and approval prior to any field investigations.
2. Perform any necessary surveys and prepare technical documentation as required for environmental resources.

The results could include the identification of potential impacts, potential mitigation, and necessary permits.

Refer to the Environmental Process Manual of Instruction for further information.

II. ENVIRONMENTAL CLEARANCE MEMOS

A. Prepare Environmental Clearance Memos

1. Prepare any environmental clearance memos required for the project.
Refer to the Environmental Process Manual of Instruction for further information.

B. Coordinate with Agencies

1. UDOT environmental staff will coordinate with agencies as required regarding potentially impacted resources.

Refer to the Environmental Process Manual of Instruction.

C. Provide Environmental Resource Information

1. Provide information about the environmental resource locations to the designers.

D. Complete Environmental Document Form in ePM

1. Complete the environmental document form in ePM Screen 770 and attach all necessary documentation.

Refer to the Environmental Process Manual of Instruction for more information.

Ensure all applicable ePM sections are completed.

III. PUBLIC HEARING SUMMARY

A. Determine Need for Public Hearing

1. Determine if a public meeting, public hearing or an opportunity for a public hearing is necessary.

Refer to the Environmental Process Manual of Instruction.

2. Coordinate with the Region Public Involvement Manager.

B. Advertise for Public Meeting/Hearing

1. Determine the methods of advertisement and include all necessary information.

Refer to the Environmental Process Manual of Instruction.

Prepare for and Hold Public Meeting/Hearing

1. Refer to the Environmental Process Manual of Instruction.

Prepare Summary of Comments

1. Compile and address all comments.

IV. PUBLIC MEETING/HEARING SUMMARY REPORT

A. Prepare Public Meeting/Hearing Summary Report

1. Compile all public meeting/hearing materials, for inclusion in the environmental document, including but not limited to:

Advertisements

Sign-in sheets

Display boards

Comments and responses

2. Refer to the Environmental Process Manual of Instruction.

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Environmental Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3E1 Prepare/Obtain Permit(s)

Overview

Prepare, submit, and obtain permits necessary for the project based on the impacts identified in the environmental document.

References

UDOT Environmental Process Manual of Instruction

UDOT Environmental Web Page

UDOT QC/QA Documentation

Deliverables & Tasks

I. PERMIT APPLICATION(S)

A. Prepare and Submit Permit(s)

1. Prepare permits and submit to UDOT Environmental for review. UDOT Environmental will submit the permit applications to the resource agencies as required.

B. Coordinate with Jurisdictions

1. UDOT Environmental will coordinate with the various jurisdictions requiring permits to obtain signed permits.

II. APPROVED PERMIT(S)

A. Document in Project Commitment Database

1. Approved permits including all required mitigation should be included in the project commitment database or spreadsheet.

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Environmental Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4E1 Obtain Environmental Document Approval

Overview

Submit completed environmental document to Region Environmental Manager for review and approval.

References

UDOT Environmental Process Manual of Instruction
UDOT Environmental Web Page
NEPA Assignment Program QA/QC Plan
Categorical Exclusion QA Review Checklist
UDOT QC/QA Documentation

Deliverables & Tasks

I. APPROVED ENVIRONMENTAL DOCUMENT

1. Submit Environmental Document for Review and Approval
2. Submit the completed environmental document for review.
Incorporate comments based on reviews from the region environmental staff and resubmit as necessary.
3. Obtain an approved environmental document from the Region Environmental Manager.

II. QA/QC DOCUMENTATION (DOCUMENTED CATEGORICAL EXCLUSIONS ONLY)

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Environmental Design QC Checklist before distribution.
Complete all necessary corrections from the QA/QC checklist.
Upload all QA/QC documentation into ProjectWise.
2. For Documented Categorical Exclusions, the Region Environmental Manager will perform a QA/QC review per the 327 NEPA Assignment QA/QC Plan and coordinate the QA/QC review and approval with an assigned Environmental Program Manager.

CMGC

1F1 Obtain CMGC Contractor

Overview

Perform all activities related to obtaining a CMGC contractor including preparing procurement documents, evaluations, and contract execution.

References

Consultant Services Manual of Instruction

Consultant Services Website

ePM Contract Management System (CMS)

Deliverables & Tasks

I. CONTRACTOR REQUEST FOR LETTERS OF INTEREST (RLOI)

A. Prepare RLOI

1. Draft RLOI submission requirements as a Word document.

B. Advertise RLOI

1. Submit RLOI to Consultant Services for Advertisement.

C. Post Response List

1. Post list of Contractors who responded to the RLOI on the Department's website.

II. CONTRACTOR REQUEST FOR PROPOSALS (RFP)

A. Prepare RFP

1. Hold a Scoping Meeting
2. Develop Project Design Assistance Needs
3. Develop Scope of Work for Contractor RFP
4. Develop Evaluation Criteria for RFP
5. Review and Finalize RFP

B. Advertise RFP

1. Submit RFP to Consultant Services for Advertisement.

III. RESPONSES TO REQUEST FOR CLARIFICATIONS (RFC)

A. Generate responses to contractor RFCs

1. Post responses online to all Contractor's Requests for Clarifications related to the RFP.

IV. SELECTION TEAM PRESENTATION

A. Evaluate Contractor RFPs

1. Compare all submitted Contractor proposals to the RFP and score based on predetermined criteria.

B. Create Presentation for Oversight Committee

1. Present selection, backup information, and recommendation to Oversight Committee.

V. EXECUTED CONTRACTOR PRE CONSTRUCTION CONTRACT

A. Contract Negotiations

1. Attend a Pre-Negotiation Meeting.
2. Review and Approve Contractor Contract Submittals.

B. Finalize Contract

1. Sign and Submit final contract to Consultant Services.

2F1 CMGC Geometry Constructability Review

Overview

Perform constructability review of the Geometry Review Package.

Deliverables & Tasks

I. CONSTRUCTABILITY REVIEW COMMENT FORM

A. Perform Constructability Review

1. Review the proposed Geometry Review Plans for potential construction issues.

The purpose of the review is to identify and eliminate potential obstacles to construction that could lead to errors, delays, and/or overruns.

Key areas of the review should include, but are not limited to the following:

- Alignment
- Utility Conflicts
- Construction Phasing
- Staging Areas
- Location and Placement of Equipment
- Temporary Shoring
- Traffic Control Requirements
- Availability of Resources
- Methods of Construction
- Opportunities for Innovation
- Identify Areas for Schedule, Cost or Quality Improvements

B. Provide Constructability Comments

1. Summarize constructability comments into the comment form and submit to the Project Manager

2F2 CMGC Geometry Risk Workshop

Overview

Conduct a risk analysis workshop with the entire project team.

References

Risk Management Tools Website

Deliverables & Tasks

I. RISK REGISTER

A. Develop Risk Register

1. Develop a risk register that captures all relevant project risks.

Utilize Risk Management Tools available on the UDOT risk website for developing the register.

Determine who will be responsible for maintaining and updating the register.

II. MITIGATION STRATEGIES

A. Develop Mitigation Strategies

1. Identify mitigation strategies to minimize and/or eliminate risks from the risk register. Incorporate into the project documents as appropriate.
2. Retire risks that have been eliminated.

2F3 CMGC Geometry OPCC Estimate

Overview

Produce a project cost estimate based on the Geometry Review Package.

Deliverables & Tasks

I. BID ITEM LIST

A. Generate a List of Bid Items and Associated Quantities

1. The Designer generates a list of bid items from the current level of design.

II. RECONCILED QUANTITIES

A. Perform Quantity Take-offs for Bid Items

1. Utilize various tools and methods to perform take-offs from design for bid item quantities.

B. Meet to Reconcile Quantities

1. Review, compare, and identify differences between quantities from each team.
2. Discuss and eliminate differences to arrive at an agreement on all bid item quantities.

III. ESTIMATING ASSUMPTIONS DOCUMENT

A. Document the Basis for Item Pricing

1. Each team documents their understanding and assumptions for all bid items and allocation of other general costs.

IV. OPINION OF PROBABLE CONSTRUCTION COST ESTIMATE

A. Provide Pricing for Bid Items

1. Each team provides pricing information in the pricing form.

V. PRICE COMPARISON MEETING

A. Meet to discuss:

1. Differences in prices between EE, ICE, and Contractor to assist in future bidding.

3F1 CMGC Plan-In-Hand Constructability Review

Overview

Perform constructability review of the Plan-In-Hand (PIH) Package.

Deliverables & Tasks

I. CONSTRUCTABILITY REVIEW COMMENT FORM

A. Perform Constructability Review

1. Review the proposed (PIH) Review Plans for potential construction issues.

The purpose of the review is to identify and eliminate potential obstacles to construction that could lead to errors, delays, and/or overruns.

Key areas of the review should include, but are not limited to the following:

- Utility Conflicts

- Construction Phasing

- Staging Areas

- Location and Placement of Equipment

- Temporary Shoring

- Traffic Control Requirements

- Availability of Resources

- Methods of Construction

- Opportunities for Innovation

- Identify Areas for Schedule, Cost or Quality Improvements

B. Provide Constructability Comments

1. Summarize constructability comments into the comment form and submit to the Project Manager.

3F2 CMGC Plan-In-Hand Risk Workshop

Overview

Conduct a risk analysis workshop with the entire project team.

References

Risk Management Tools Website

Deliverables & Tasks

I. RISK REGISTER

A. Develop Risk Register

1. Develop a risk register that captures all relevant project risks.

Utilize Risk Management Tools available on the UDOT risk website for developing the register.

II. MITIGATION STRATEGIES

A. Develop Mitigation Strategies

1. Identify mitigation strategies to minimize and/or eliminate risks from the risk register.
2. Incorporate into the project documents as appropriate.
3. Retire risks that have been eliminated.

3F3 CMGC Plan-In-Hand OPCC Estimate

Overview

Produce a project cost estimate based on the Plan-In-Hand (PIH) Review Package.

Deliverables & Tasks

I. BID ITEM LIST

A. Generate a List of Bid Items and Associated Quantities

1. The Designer generates a list of bid items from the current level of design.

II. RECONCILED QUANTITIES

A. Perform Quantity Take-offs for Bid Items

1. Utilize various tools and methods to perform take-offs from design for bid item quantities.

B. Meet to Reconcile Quantities

1. Review, compare, and identify differences between quantities from each team.
2. Discuss and eliminate differences to arrive at an agreement on all bid item quantities.

III. ESTIMATING ASSUMPTIONS DOCUMENT

A. Document the Basis for Item Pricing

1. Each team documents their understanding and assumptions for all bid items and allocation of other general costs.

IV. OPINION OF PROBABLE CONSTRUCTION COST ESTIMATE

A. Provide Pricing for Bid Items

1. Each team provides pricing information in the pricing form.

V. PRICE COMPARISON MEETING

A. Meet to discuss:

1. Differences in prices between EE, ICE, and Contractor to assist in future bidding.

4F1 CMGC Plans, Specs & Estimate Constructability Review

Overview

Perform constructability review of the Plans, Specs, and Estimate (PS&E) Package.

Deliverables & Tasks

I. CONSTRUCTABILITY REVIEW COMMENT FORM

A. Perform Constructability Review

1. Review the proposed PS&E level Plans for potential construction issues.

The purpose of the review is to identify and eliminate potential obstacles to construction that could lead to errors, delays, and/or overruns.

Key areas of the review should include, but are not limited to the following:

- Utility Conflicts

- Construction Phasing

- Staging Areas

- Location and Placement of Equipment

- Temporary Shoring

- Traffic Control Requirements

- Availability of Resources

- Methods of Construction

- Opportunities for Innovation

- Identify Areas for Schedule, Cost or Quality Improvements

B. Provide Constructability Comments

1. Summarize constructability comments into the comment form and submit to the Project Manager.

4F2 CMGC Plans, Specs & Estimate Risk Workshop

Overview

Conduct a risk analysis workshop with the entire project team.

References

Risk Management Tools Website

Deliverables & Tasks

I. RISK REGISTER

A. Meet to Develop Risk Register

1. Develop a risk register that captures all relevant project risks.
Utilize Risk Management Tools available on the UDOT risk website for developing the register.

II. MITIGATION STRATEGIES

A. Develop Mitigation Strategies

1. Identify mitigation strategies to minimize and/or eliminate risks from the risk register.
2. Incorporate strategies into the project documents as appropriate.
3. Retire risks that have been eliminated.

4F3 CMGC PS&E Estimate

Overview

Produce a project cost estimate based on the Plans, Specs, and Estimate (PS&E) Package.

Deliverables & Tasks

I. BID ITEM LIST

A. Generate a List of Bid Items and Associated Quantities

1. The Designer generates a list of bid items from the current level of design.

II. RECONCILED QUANTITIES

A. Perform Quantity Take-offs for Bid Items

1. Utilize various tools and methods to perform take-offs from design for bid item quantities.

B. Meet to Reconcile Quantities

1. Review, compare, and identify differences between quantities from each team.
2. Discuss and eliminate differences to arrive at an agreement on all bid item quantities.

III. ESTIMATING ASSUMPTIONS DOCUMENT

A. Document the Basis for Item Pricing

1. Each team documents their understanding and assumptions for all bid items and allocation of other general costs.

IV. OPINION OF PROBABLE CONSTRUCTION COST ESTIMATE

A. Provide Pricing for Bid Items

1. Each team provides pricing information in the pricing form.

V. PRICE COMPARISON MEETING

A. Meet to discuss

1. Differences in prices between EE, ICE, and Contractor to assist in future bidding.

5F1 CMGC Issue For Bid Pricing

Overview

Compile final project pricing from all discipline deliverables into one final design package.

Deliverables & Tasks

I. BID ITEM LIST

A. Update Bid Item List

1. The Designer revises the list of bid items based on the current level of design.

II. RECONCILED QUANTITIES

A. Take-Off Quantities for Bid Items

1. Utilize various tools and methods to assign quantities for bid item quantities.

B. Meet to Reconcile Quantities

1. Review, compare, and identify differences between quantities from each team.
2. Discuss and eliminate differences to arrive at an agreement on all bid item quantities.

III. OPINION OF PROBABLE CONSTRUCTION COST ESTIMATE

A. Document the Basis for Bid Item Pricing

1. Each team documents their understanding and assumptions for all bid items and allocation of other general costs.

IV. ELECTRONIC BID SYSTEM PRICING INPUT

A. Provide Pricing for Bid Items in Masterworks

1. Each team provides pricing information into the Electronic Bid System.

GEOTECHNICAL

1G1 Conduct Preliminary Geotechnical Investigation

Overview

Obtain information on general site and soil conditions that might affect the project scope, schedule, budget, risks, and opportunities; and prepare the Geotechnical Subsurface Exploration Plan (GSEP). Refer to UDOT Geotechnical Manual of Instruction (GMOI) for guidance.

References

UDOT Geotechnical Manual of Instruction (GMOI)

UDOT Geotechnical QC/QA Procedures

UDOT Exploratory Drilling Permit to Enter

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. GEOTECHNICAL SUBSURFACE EXPLORATION PLAN

A. Review Existing Available Information (Geotechnical Literature Review)

1. See the UDOT GMOI.

B. Conduct Field Reconnaissance

1. See the UDOT GMOI.

C. Develop Geotechnical Subsurface Exploration Plan

1. Use the UDOT GMOI to aid in developing a geotechnical subsurface exploration plan for obtaining the necessary information to complete the geotechnical design.
2. Include a summary of the existing geotechnical information and other related literature, and field reconnaissance findings in the project description and background information of the Geotechnical Subsurface Exploration Plan.
3. Submit the Plan to the design team and to the UDOT Geotechnical Project Engineer.

II. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.

Provide the Checker with a project document cover sheet, check print, and supporting documentation for the Geotechnical Subsurface Exploration Plan.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload required documentation of quality procedures into ProjectWise before the Plan-in-Hand Meeting.

Refer to UDOT GMOI Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

3G1 Conduct Geotechnical Investigation

Overview

Conduct subsurface exploration for all cuts, fills, retaining walls, and foundation designs.

References

UDOT Geotechnical Manual of Instruction (GMOI)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. SOIL SAMPLES

A. Perform Subsurface Exploration and Sampling

1. Obtain all permits and clearances in advance of any actual subsurface exploratory work. (See UDOT GMOI)
2. Conduct the subsurface explorations according to the GSEP.
3. Information obtained in this task is finalized in the PS&E stage for the signed and sealed soil data sheets and geotechnical report.

B. Sort and Submit Samples for Laboratory Testing

1. Properly retrieve, seal, label, store, and transport samples for laboratory testing.

II. FIELD SOIL LOGS

A. Prepare Field Subsurface Exploration Logs

1. Prepare soil logs in accordance with the UDOT GMOI.
2. Information obtained in this task is finalized in the PS&E stage for the signed and sealed soil data sheets and geotechnical report.

B. Request Survey for Subsurface Exploration Locations (Horizontal Coordinates and Elevations)

1. Coordinate with the roadway designer to request survey for subsurface exploration locations.

III. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT Geotechnical Manual of Instruction before distribution.

Provide the Checker with a project document cover sheet, check print, and supporting documentation for the Field Logs.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload required documentation of quality procedures into ProjectWise once complete (prior to the PS&E stage).

Refer to UDOT GMOI Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

3G2 Conduct Geotechnical Testing

Overview

Conduct laboratory soil testing and prepare the soil test summary.

References

UDOT Geotechnical Manual of Instruction (GMOI)

UDOT Structures QC/QA Procedures

AASHTO Materials Reference Laboratory (AMRL Standards)

Deliverables & Tasks

I. INDIVIDUAL SOIL TEST RESULTS

A. Develop Testing Program

1. Identify tests necessary to support geotechnical analysis according to the UDOT GMOI and AASHTO/AMRL standards.

Refer to UDOT GMOI for testing requirements, preparations, and overall guidance.

B. Prepare Soil Test Samples

1. Prepare the necessary samples for laboratory testing.

C. Conduct Laboratory Tests

1. Conduct laboratory soil testing to aid in assessing geotechnical design parameters and risks related to settlement, slope stability, liquefaction/lateral spread, as well as foundation and retaining wall design.

D. Prepare Individual Soil Test Results

1. Prepare charts and graphs (as necessary) showing results of individual tests.
Note any irregularities or compromised samples.
2. Information obtained in this task is finalized in the PS&E stage and incorporated into the signed and sealed soil data sheets and geotechnical report.

II. SOIL TEST SUMMARY

A. Prepare Soil Test Summary

1. Prepare a summary of test data.

Include the following information:

Summary table containing results.

Note any irregularities or compromised samples.

2. Information obtained in this task is finalized in the PS&E stage and incorporated into the signed and sealed soil data sheets and geotechnical report.

III. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.

Provide the Checker with a project document cover sheet, check print, and supporting documentation for the individual soil test results and soil test summary.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload required quality documentation into ProjectWise once complete and prior to PS&E stage.

Refer to the UDOT GMOI, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

3G3 Complete Foundation Type Memo

Overview

Complete structure foundation recommendations memo for the structural engineer.

References

UDOT Geotechnical Manual of Instruction (GMOI)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. STRUCTURE FOUNDATION RECOMMENDATIONS MEMO

A. Prepare a Structure Foundation Recommendations Memo or SFRM

1. Assess cost-effective structure foundation alternatives, develop preliminary structure foundation recommendations, and submit the memo to the structural engineer. (See UDOT GMOI)

II. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.

Provide the Checker with a project document cover sheet, check print, and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload required documentation of quality procedures into ProjectWise prior to Plan-In-Hand.

Refer to UDOT GMOI, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

4G1 Complete Geotechnical Design and Draft Report

Overview

Perform geotechnical design of project elements including an assessment of settlement, slope stability, liquefaction/lateral spread as well as foundation and retaining wall design and develop a draft geotechnical report for review.

References

UDOT Geotechnical Manual of Instruction (GMOI)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. SUBSURFACE EXPLORATION LOGS

- A. Prepare Subsurface Exploration Logs for Soil Data Sheets (if applicable)
 - 1. Prepare geotechnical subsurface exploration logs according to the UDOT GMOI.
Generate the logs in a graphical format (e.g., PDF) that is compatible with MicroStation.
 - 2. Information obtained in this task is finalized in the PS&E stage for the signed and sealed soil data sheets.

II. DRAFT GEOTECHNICAL REPORT

- A. Conduct Geotechnical Analysis
 - 1. Conduct geotechnical analysis according to the UDOT GMOI.
 - 2. Perform the geotechnical design of project elements including an assessment for settlement, slope stability, liquefaction/lateral spread, foundation, and retaining wall design.
 - 3. As applicable, develop an instrumentation plan for construction and long-term monitoring.
- B. Complete geotechnical analyses for Bridge Foundations, and Retaining Walls that includes assessments of, Slope Stability, Settlement, and Liquefaction/Lateral Spread
 - 1. Develop calculations for bridge foundations, retaining walls, slope stability, settlement, liquefaction/lateral spread, etc., as required.
- C. Develop Recommendations for the Geotechnical Report
 - 1. Develop foundation and earthwork recommendations as applicable.
 - 2. Provide preliminary recommendations to the roadway and structural design engineers as required.
- D. Prepare Draft Geotechnical Report
 - 1. Prepare the draft geotechnical report and include recommendations, design parameters, calculations and applicable data according to the UDOT GMOI.
 - 2. Include preliminary project documents in the draft geotechnical report:
 - Draft subsurface exploration logs provided to structural engineer for soil data sheets (if applicable)
 - Draft special provisions
 - Draft geotechnical detail plan sheets (if applicable)
 - Draft geotechnical design calculations

III. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

- A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.

Provide the Checker with a project document cover sheet, check print, and supporting documentation for the individual sections within the draft geotechnical report.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload required documentation of quality procedures into ProjectWise prior to PS&E.

Refer to UDOT GMOI, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

4G2 Develop Geotechnical Project Documents

Overview

Finalize geotechnical plan sheets, special provisions, and other documents required for the advertisement of the project.

References

UDOT CADD Standards
UDOT Geotechnical Manual of Instruction (GMOI)
UDOT Structures QC/QA Procedures
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT Specification Writer's Guide
UDOT Standard Drawings and Standard Specifications

Deliverables & Tasks

I. GEOTECHNICAL SOIL DATA SHEETS (IF APPLICABLE)

A. Finalize Geotechnical Soil Data Sheets (if applicable)

1. Coordinate with the structural design engineer (or drafter) to complete the soil data sheets.
2. Sign and seal the soil data sheets after the quality procedures are complete.

II. GEOTECHNICAL SPECIAL PROVISIONS (IF APPLICABLE)

A. Finalize Geotechnical Special Provisions (if applicable)

1. Provide all necessary special provisions and revisions to specifications required for project construction.
2. Follow the UDOT Specification Writer's Guide to complete all necessary specifications.

III. GEOTECHNICAL DETAIL PLAN SHEETS (IF APPLICABLE)

A. Finalize Geotechnical Details for Plan Sheets (if applicable)

1. Finalize geotechnical details to be included in plan sheets if necessary. Coordinate with the structural design engineer (drafter) or the roadway designer.
2. Plan sheets follow the UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website.
 - General Plan Sheet Requirements
 - Detail Sheet Requirements
 - Include all necessary notes, callouts, dimensions, symbols, etc.
 - Make sure all symbols and line styles are identifiable
 - Sign and seal plan sheets

IV. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.
 - Provide the Checker with a project document cover sheet, check print, and supporting documentation for the individual deliverables.
 - Follow the UDOT Structures QC/QA Procedures for checking and auditing.
 - Upload required documentation of quality procedures into ProjectWise.

Refer to UDOT GMOI, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

4G3 Finalize Geotechnical Report

Overview

Finalize the geotechnical report.

References

UDOT Geotechnical Manual of Instruction (GMOI)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. GEOTECHNICAL REPORT

A. Finalize Geotechnical Report

1. Review and coordinate responses to finalize all review comments on the draft geotechnical report.
2. Revise the draft geotechnical report to incorporate and address all review comments and finalize the geotechnical report.
3. Verify all geotechnical project documents are complete.

II. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.
 - Provide the Checker with a project document cover sheet, check print, and supporting documentation for the individual deliverables.
 - Follow the UDOT Structures QC/QA Procedures for checking and auditing.
 - Upload required documentation of quality procedures into ProjectWise.
 - Refer to UDOT GMOI, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

6G1 Geotechnical Construction Services

Overview

Review construction submittals and perform design and construction services during construction.

References

UDOT Geotechnical Manual of Instruction (GMOI)
UDOT Geotechnical Pile Driving Equipment (form)
UDOT Geotechnical Pile Driving Record Form
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. WORKING DRAWINGS REVIEW & ACCEPTANCE

A. Review and/or Accept Geotechnical Construction Items

1. During construction, the Geotechnical Engineer of Record may perform the following tasks:

- Review working drawings (construction submittals) as required
- Establish pile driving criteria
- Provide foundation testing and instrumentation support
- Provide PDA acceptance
- Read and interpret geotechnical instrumentation data, and provide recommendations
- Provide acceptance for surcharge release
- Geotechnical construction review and verification

2. Provide geotechnical field support.

II. GEOTECHNICAL CONSTRUCTION RESPONSES

A. Perform Design Services

1. Perform design services during construction if necessary.
2. Revise design calculations as required.

III. DOCUMENTATION OF QUALITY PROCEDURES (Defined in Chapter 5 of GMOI)

A. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and UDOT GMOI before distribution.
 - Provide the Checker with the applicable cover sheets, check print of each deliverable, and supporting documentation.
 - Follow the UDOT Structures QC/QA Procedures for checking and auditing.
 - Upload required documentation of quality procedures into ProjectWise.
 - Refer to UDOT GMOI, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

STRUCTURE HYDRAULICS

2H1 Develop Initial Structure Hydraulics

Overview

Develop preliminary structure hydrologic and hydraulic analyses and scour countermeasure design.

References

UDOT Drainage Manual of Instruction

UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY DRAINAGE SUMMARY

A. Review Existing Drainage Information

1. Locate any information about the project area that could include, but is not limited to the following:

As-built plans

Structure inspection records

Local government master plans

FEMA flood maps

Utah Division of Environmental Quality interactive map

Agreements

B. Conduct Drainage Field Review

1. Determine roughness coefficients of the channel and floodplain.
2. Coordinate with the Geotechnical Engineer to obtain and determine the D50 of the channel surface and subsurface material layers.
3. Evaluate channel geomorphology.

C. Coordinate with Maintenance Team

1. Attend the Maintenance/Pre Construction site-visit
See 1Y2 and 1R1 Maintenance Site Visit Form

II. INITIAL STRUCTURE LAYOUT

A. Perform Hydrologic Analysis

1. Determine the design frequency event and estimate peak flow rates.

B. Perform Hydraulic Analysis

1. Perform hydraulic analyses to determine opening requirements
Consider backwater effects and debris passage.
2. Evaluate preliminary structure geometry, type, and span.
3. Evaluate bridge scour and structure foundation type and depth.
4. Evaluate and select scour countermeasures.

C. Conduct Conflict Analysis

1. Identify potential conflicts with other design elements.
2. Identify potential conflicts with existing and proposed utilities.
3. Identify design elements inside roadway clear zone.
4. Identify design elements outside the project ROW.

D. Coordinate with Project Team Members

1. Coordinate the drainage design with the project team and other disciplines as necessary to ensure compliance with UDOT standards and requirements.
2. Coordinate and mitigate project design conflicts, risks and impacts.

III. DRAFT STRUCTURE HYDRAULICS REPORT

A. Draft Structure Hydraulics Report

1. Prepare a draft structure hydraulics report according to the Drainage Manual of Instruction.

IV. PRELIMINARY DRAINAGE COST ESTIMATE

A. Develop Preliminary Drainage Cost Estimate

1. Compile initial drainage bid items and quantities.

Use UDOT standard bid items.

2. Develop unit costs for each item.

Use appropriate resources for developing unit costs such as Masterworks.

Document unit cost development and assumptions.

Account for project specific factors:

Location

Time of year

Limitations of operation

Quantity of item

Current bidding environment

Availability of materials

Familiarity of process

Specialty equipment

Risk to contractor

Inflation

Construction Schedule

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Structure Hydraulics Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4H1 Complete Structure Hydraulic Design

Overview

Complete structure hydraulics design and report.

References

Masterworks

Form F1: Milestone Review Comment Resolution Form

UDOT Drainage Manual of Instruction

UDOT QC/QA Documentation

Deliverables & Tasks

I. STRUCTURE HYDRAULIC DESIGN

A. Address Plan-in-Hand Review Comments

1. Complete the structure hydraulic portions of the Plan-in-Hand Review Comment Resolution Form.

Respond to each structure hydraulic related comment.

Make revisions to the design and deliverables according to the responses.

Conduct QC Review and Verification of all comments.

2. Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Finalize Structures Hydraulic Analysis

1. Complete structures hydraulic analysis according to the Drainage Manual of Instruction.

C. Finalize Scour Protection and Countermeasure Design

1. Complete scour protection and countermeasure design according to the Drainage Manual of Instruction.

The design may take several iterations before it is finalized.

Coordinate with the structures team.

II. STRUCTURE HYDRAULIC REPORT

A. Finalize Structures Hydraulic Report

1. Finalize the Hydraulics Report, include all necessary drainage elements and data for the project according to the Drainage Manual of Instruction.

III. DRAINAGE COST ESTIMATE

A. Finalize Drainage Cost Estimate

1. Update drainage and stormwater quality bid items and quantities.
2. Update drainage unit costs. (see 2H1)

B. Enter Drainage Cost Estimate into Masterworks

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Structure Hydraulics Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

ROW DESIGN

1J1 Identify Existing Right-of-Way

Overview

Identify existing Right-of-Way (ROW) along the project and adjacent ownerships.

References

ePM

UDOT CADD Standards

UDOT Digital Delivery Website

UDOT QC/QA Documentation

UDOT Right-of-Way Division Website

UDOT Standard Drawings

If Local Government Project

- Identify critical parcels early in the process

- Prepare Cost Estimates

- Prepare preliminary Right-of-Way Plans and Ownership Records

- Review Right-of-Way documents when the project impacts a city or county road and the property to be acquired is in the city or county's name

- Develop Coop Modification for Right-of-Way (CAMROW)

- Prepare Resource Plan

- Process CAMROW and R-709 form

Deliverables & Tasks

I. EXISTING ROW MICROSTATION FILE (PIN_PROJECT_EXROW.DGN)

A. Research Existing ROW and Property Boundaries for Project Area

1. Do the following for the entire project limits:

- Identify all property owners

- Obtain existing UDOT ROW plans

- Obtain tax IDs

- Obtain vesting deeds and documents

- Obtain county ownership plat maps

- Obtain mining claims

- Obtain subdivision plats

- Obtain Record of Survey plats

- Obtain Utility maps and deeds to identify utility easements and right-of-ways

- Other documents as may be necessary to complete the task

2. Potential Contacts

- County Recorder

- UDOT ROW

- BLM Officials

- County Surveyor

- Utility Companies

- Municipality Surveyor

- Railroad Companies

- Additional Surveyors

- Title Companies

B. Develop Existing ROW Mapping and MicroStation Files

1. Comply with current UDOT CADD Standards to develop the Exrow.dgn file.
Create the Exrow.dgn from the geo-referenced seed file for the project from task 1B1.

Develop all linework in MicroStation and adhere to CADD standards.

Convert existing right-of-way information into the geo-referenced Exrow.dgn based on the correct project coordinate system.

Identify boundary gaps and overlaps and other inconsistencies or ambiguities that will need to be cleaned up if further action is required on the parcels.

Assign a UDOT Ownership number to each ownership south to north or west to east beginning at #100 typically.

Do not number up one side of the highway and back the other but stagger the numbering.

II. PROPERTY OWNER SPREADSHEET

A. Develop Property Spreadsheet

1. Develop a spreadsheet containing:

All owner names beginning with the lowest UDOT ownership number assigned

Property addresses

Mailing address

Tax ID numbers

Size of overall ownership

Property type

Zoning

Other pertinent property or ownership data

Phone number & email address to be provided by Public

Involvement Team

2. Provide the ROW acquisition team with the spreadsheet and upload to the Right-of-Way folder in ProjectWise.

B. Identify Potential Impacts

1. Identify potential ROW and easement impacts of all types.

2. Identify the level of risk, source (roadway, utilities, drainage, etc), and possible mitigations of each impact if possible.

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the ROW Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC check.

Upload all QC documentation into the ROW folder in ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4J1 Identify Right-of-Way Needs

Overview

Coordinate with the project team to identify all ROW acquisitions and update the Property Owner Spreadsheet with projected dates for delivery to begin acquisition.

References

Project Designs

UDOT QC/QA Documentation

UDOT Right-of-Way Division Website

Deliverables & Tasks

I. UPDATED PROPERTY OWNER SPREADSHEET WITH DATES FOR DELIVERY

A. Identify Parcels for Acquisition

1. The ROW Designer coordinates with the project team and the Right-of-Way Lead to update the Property Owner Spreadsheet.
2. The Property Owner Spreadsheet will be updated and identify all ownerships affected by the design.
 - Give each parcel and easement a UDOT number
 - Calculate how many summaries will be submitted for the project (10 Ownerships per summary), and which parcels will be on each summary and date for submittal to the Region Right-of-Way.
3. Parcels and estimates include:
 - Partial Summary number and expected delivery date to begin acquisition.
 - UDOT Parcel number (e.g. 100:A, 100:E, 100:C etc.)
 - Areas for each acquisition for each UDOT Parcel identified.

II. UPDATED ROW ESTIMATE

A. Update ROW Estimate

1. Verify property owner information has not changed.
2. Review and update project ROW cost estimate in ePM.
 - Needs to be coordinated with ROW Acquisition before any Summaries are delivered.
3. Update the Project Manager on the current status of project ROW estimate.
4. Enter property information for parcels affected by design in ePM.
5. Continually coordinate with the project team for changes in schedule.
6. Update the Property Owner Spreadsheet to reflect any changes.

III. QC DOCUMENTATION

A. Perform the QC Review following the UDOT QC/QA Procedures and the ROW Design QC Checklist before distribution.

1. Provide the Checker with a check print of each deliverable and supporting documentation.
2. Complete all necessary corrections from the QC procedure.
3. Upload all QC documentation into ProjectWise and attribute it correctly when submitting the summary for Region review.

4J2 Develop Right-of-Way Plans and Documents

Overview

Develop ROW plans and documents. Repeat this activity for each partial, final, and supplemental summary.

References

Additional Information for Right-of-Way
Scanning and Mapping Website
UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT Right-of-Way Operational Manual
Right-of-Way Design Manual
UDOT Right-of-Way ProjectWise Guide
UDOT Standard Drawings

Deliverables & Tasks

I. ROW SUMMARY

A. Develop ROW Design

1. Right-of-Way Designer must use a Geo-Referenced seed file to develop the ROW.dgn and ROW_Takes.dgn files and match the Exrow.dgn file previously provided and updated as needed.
2. Develop the ROW plans to show required acquisitions to accommodate all aspects of the project. Include fee acquisitions, slope easements, temporary construction easements, drainage easements, and utility relocations and easements.
3. Show all previously submitted project acquisition parcels on the plans
Show parcels from 1st partial with the 2nd partial summary, do not show parcels which have not been submitted.
4. Adhere to UDOT CADD Standards for levels and styles.
5. Follow requirements and recommendations in the Right-of-Way Design Manual.
6. Update the Property Owner Spreadsheet with applicable information prior to submitting the summary for acquisition.
7. Follow the delivery method as defined in the Right-of-Way ProjectWise Guide.

B. Develop ROW Plan Sheets

1. Develop all sheets according to current UDOT CADD Standards and UDOT Plan Sheet Development Standards or UDOT Digital Delivery Website.
2. Verify property owner is labeled
Owner name and Recorded Entry Number are updated and accurate prior to submitting the summary for acquisition.
3. ROW Plans are clean without text and lines overlapping.
4. ROW Plans will stand alone and provide sufficient data to reproduce the right-of-way and acquisitions.

C. Prepare ROW Legal Descriptions

1. Prepare legal descriptions for each parcel to be acquired following the UDOT Right-of-Way Operational Manual and the Right-of-Way Design Manual.

D. Prepare ROW Documents

1. Prepare the following documents:

Transmittal Sheet
Ownership Record - RW51
Summary Sheet - Form-RW53
Signature Documents (deeds and easements)
ePM Summary
Vesting Documents
Deed calculation documents
QC Documents
GIS Files
ROW Plan Sheets

2. Prepare each document in the correct format.

III. MICROSTATION FILES

(GEO-REFERENCED EXROW.DGN, ROW.DGN & ROW_TAKES.DGN)

A. Develop MicroStation Files

1. The Right-of-Way Designer will use a geo-referenced seed file to develop the ROW.dgn and the ROW_Takes.dgn files and match the Exrow.dgn file previously provided and updated as needed.
2. The MicroStation files will be uploaded or updated within the UDOT ProjectWise Right-of-Way folder for the appropriate project for each summary delivered.

III. FINAL ROW PLANS

A. Develop Final ROW Plans

1. Prepare Final ROW Plans and include them with the Final Partial Summary.
Provide plans that are sealed by a Utah Professional Land Surveyor.
2. Final ROW Plans are to include the Survey Control Sheets.
3. For projects requiring Right-of-Way monuments:
Identify the locations on the Final ROW Plans.
Provide a record of survey plat by a Utah Professional Land Surveyor.

IV. ePM UPLOAD

A. Upload Information into ePM

1. Populate the Right-of-Way Module in ePM with the correct parcel information for each summary submitted for the project.

V. PROJECTWISE UPLOAD

A. Upload All Documents into ProjectWise

1. Upload and attribute all necessary documents for each summary into the UDOT project Right-of-Way folder in ProjectWise following the UDOT Right-of-Way ProjectWise Guide.

VI. GIS CONVERSION FILES

VII. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the ROW Design QC Checklist before distribution.
Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC check.
Upload all QC documentation into ProjectWise and attribute it correctly
before or at the distribution of the milestone review package.

4J3 Conduct Right-of-Way Review

Overview

Review ROW plans, deeds, and all related documents and provide comments.

References

UDOT Right of Way Design Manual

Deliverables & Tasks

I. ROW PLAN REVIEW

A. Review ROW Plans

1. Ensure (or verify) the ROW design accommodates all design features, including all necessary easements, and provide feedback, as required.
2. Conform to the UDOT Right-of-Way ProjectWise Guide.

II. ROW DEED REVIEW

A. Review ROW Deeds

1. Review ROW deeds and provide comments.

III. ROW DOCUMENT REVIEW

A. Review ROW documents and provide comments.

ROW ACQUISITION

4L1 Conduct Right-of-Way Appraisals

Overview

Value each parcel required for the project to determine the fair market value. Valuation may be done either by Appraisal or Compensation Estimate.

References

Administrative Compensation Estimates

UDOT Right-of-Way Division Website

Deliverables & Tasks

I. APPRAISAL (ELECTRONIC)

A. Order Appraisal

1. Assign an appraiser and review appraiser to estimate the value of each ROW acquisition.

B. Conduct Appraisal

1. Acquire and review the county tax assessor records (including DEQ & DERR where applicable)
2. Collect and analyze applicable comparable sales data
3. Conduct a drive-by inspection of the property
4. Meet with property owner
5. Complete appraisal
6. Submit appraisal to consultant review appraiser

C. Submit to Central ROW

1. Email electronic copy of appraisal to UDOT Lead Agent

-OR-

II. ADMINISTRATIVE COMPENSATION ESTIMATE (ACE)/WAIVER EVALUATION (ELECTRONIC)

A. Order ACE/Waiver Evaluation

1. Assign ACE to Consultant to estimate the value of each acquisition.

B. Submit to Central ROW

1. Email electronic copy of ACE to UDOT Lead Agent.

4L2 Review Appraisals

Overview

Consultant Appraiser reviews appraisals from 4L1 Conduct Right-of-Way Appraisals.

References

UDOT Right-of-Way Division Website

UDOT Right-of-Way ProjectWise Guide

Deliverables & Tasks

I. ACCEPTABLE APPRAISAL & APPRAISAL REVIEW

A. Review and Accept Appraisals

1. UDOT ROW Lead Agent to review and approve appraisals from 4L1 and appraisal reviews from 4L2 to ensure fair and just compensation.

B. Update ePM ROW System

1. Update ePM ROW system with appraised values for each parcel.

C. Update Project ROW Estimate

1. Update project ROW estimate with the appraisals.
2. Review the percent of completed acquisitions and remaining acquisitions.
3. Review the percent of ROW budget spent and remaining estimated budget.
4. Update the Project Manager on the current status of ROW acquisition budget.
5. Update the Design Leader on the current status of ROW acquisition budget before each milestone meeting.

D. Submit for Acquisition

1. Upload to ProjectWise according to the UDOT Right-of-Way ProjectWise Guide.

4L3 Acquire Right-Of-Way

Overview

Acquire Right-of-Way. Complete the condemnation process for parcels that cannot be amicably acquired after good faith negotiation efforts. Assist occupants through the relocation process.

References

UDOT Right-of-Way Division Website

IF LOCAL GOVERNMENT PROJECT

The Local Government Representative reviews the final plans and stores the documents for possible future audits. They also submit a letter on local agency letterhead to the UDOT PM certifying one of the following:

All construction activities are within the confines of the existing right-of-way and it is cleared for construction.

All right-of-way activities have been acquired by Contract and/or Order of Occupancy and the project is cleared for construction

Local Government Projects can NOT be cleared with limitations.

Deliverables & Tasks

I. PURCHASE CONTRACT

- A. Set Up Files
- B. Initiate Negotiations
 - 1. Present a written offer to all parties of interest for each ownership impacted by design for construction.
- C. Obtain Voluntary Right to Occupy, Acquire Property, or Recommend Condemnation
 - 1. Determine whether a right to occupy can be acquired or if the property needs to go to condemnation.
 - 2. Send a Four Options letter.
 - 3. Submit a Request for Condemnation memo to begin the condemnation process.
- D. Complete Property Management Information Sheet in ePM as needed
- E. Submit File for Approval or Condemnation
 - 1. Submit File for approval of ROW Contract or approval to begin Condemnation Process.

II. PROPERTY DEED

- A. Check Title
 - 1. Send the deed and title instructions to the title company for review and closing for total acquisitions.
 - 2. Follow the title and closing process for partial acquisitions.
- B. Order Check
 - 1. When ROW is acquired by a signed ROW Contract and deeds, a check is to be requested by UDOT Central ROW (Closer) and delivered to Owner, Title Company, or Court by either Central ROW or the Consultant Acquisition Agent.
- C. Record Deeds
 - 1. Upon exchange of payment for the ROW with the landowner, either Central ROW or the Title Company will ensure that all deeds as part of each transaction are recorded in the correct county to vest property to UDOT.

III. ORDER OF OCCUPANCY

A. Obtain Memo from Director of ROW to Start Condemnation

1. If good faith negotiations with the owner have not resulted in either a signed ROW Contract or a Right of Entry, then the ROW consultant will turn in the entire acquisition file to the ROW Lead assigned to that project.
2. The ROW Lead shall review the entire acquisition file and submit the acquisition file to the ROW Closer/Legal Support to obtain the condemnation memo from the Director of ROW to approve the start of the condemnation process.

B. Review Title Report

1. The Department's ROW Closer/Legal Support will request an updated or new title report to verify ownership of the parcel needed as part of the condemnation request and ensure that all title interests have been identified before submitting the condemnation request to the ROW Director for approval.

C. Review Legal Description

1. The Department's Closer/Legal Support will verify the ownership and all parcel descriptions needed as part of the condemnation to ensure the descriptions match what is intended and needed by the Department for the project and are error-free.

D. Review ROW Maps

1. The Department's Closer/Legal Support will verify the ROW Maps with the ownership record along with each parcel description needed as part of the condemnation file to ensure the ROW Maps and the Descriptions match what is intended and needed by the Department for the project and are error-free.

E. Prepare Condemnation Resolution

1. The Department's Closer/Legal Support will prepare and complete the condemnation resolution and ensure that agent logs and any additional documents needed as part of the condemnation are properly completed and are part of the condemnation package.
2. The entire condemnation package is then submitted to the ROW Director or his designee for approval and submittal to the Attorney General's (AG's) office for processing.

F. Submit to Attorney General's Office with Check

1. Upon approval of the condemnation package by the ROW Director or his designee, the Condemnation package is submitted to the AG's office by the Department's Closer.

G. Attorney General: Obtain Order of Occupancy

1. The AG's office will assign each condemnation to an attorney within the Highways & Utilities Division of the AG's Office and complete all the tasks necessary to obtain an Occupancy (Order of Immediate Occupancy (OIO) or Right of Occupancy (ROO)) on behalf of the Department.
2. The Attorney will continue all legal actions necessary in completing the condemnation until a Final Judgment or Resolution has been reached.

H. Obtain Property Deed

1. Upon completion of the condemnation process, the Attorney will obtain a Final Judgment or other conveyance document to transfer the property needed by the department into UDOT's name and submit this to the Department's Closer for recording.
2. The Department's Closer will follow the same steps in the above mentioned Record Deeds Activity.

IV. DOCUMENTATION OF RELOCATION

A. Relocate Occupants

1. Meet with the displaced person(s).
2. Prepare a relocation study.
3. Provide a notice of eligibility.
4. Monitor the actual move.
5. Prepare and file claims.
6. Review and approve claims.

V. UPDATED ROW BUDGET

A. Review Project ROW Budget

1. Review the percent of completed acquisitions and remaining acquisitions.
2. Review the percent of ROW budget spent and remaining estimated budget.
3. Update the Project Manager on the current status of ROW acquisition budget.
4. Update the Design Leader on the current status of ROW acquisition budget before each milestone meeting.

VI. RIGHT OF ENTRY & OCCUPANCY AGREEMENT WITH ACTION PLAN TO RESOLVE

5L1 Deliver Right-Of-Way Certification

Overview

Prepare and approve ROW certification.

References

UDOT Right-of-Way Division Website

Deliverables & Tasks

I. SIGNED ROW CERTIFICATION

A. Submit Certification Request

1. The Region ROW Engineer will inform the Project Manager that there is a need to acquire additional right-of-way if the design and construction improvements are not within the existing right-of-way.

If all construction activities are within the existing right-of-way, then the Region ROW Engineer will prepare the ROW Certification and have the Region Director sign for approval.

Upon approval from the Region Director, the Region ROW Engineer will submit the ROW Certification to Central Construction.

2. If project design requires additional right-of-way, the ROW Lead Agent will collaborate with the Project Manager to complete the ROW Certification Request (with or without limitations).

B. Verify Parcel Status

1. Verify that all parcels have been acquired or that a Right-of-Occupancy has been issued.

Parcels that have NOT been acquired will be classified as a construction limitation.

2. Verify that any occupants have been relocated or will relocate before construction begins.

If occupants have NOT been relocated, this is a construction limitation.

C. Approve ROW Certification

1. Certify that the project has all parcels cleared for construction activities.
2. If all parcels are not cleared for the project to commence construction activities:

ROW Lead Agent shall provide a "Committed" timeline identifying the date each parcel will be cleared and provide the Project Manager the Limitation (555 Spec language) for inclusion in the project specifications. Project Manager and Resident Engineer review and agree to pending limitations and sign the ROW Certification Request Memo, and submit the request for Certification with Limitations to the ROW Director. Approval of a Certification with Limitations must be obtained from the ROW Director.

3. Sign the ROW Certification Memorandum pending the limitations of operations.

4. Submit the completed ROW certification to the Phase Leader and Central Construction.

D. Provide Documents for Construction

1. Prepare a package for the Project Manager and Resident Engineer including the following:

Copy of the Contract and Construction Notes report

2. The Resident Engineer will provide 30 days notice to the local government surveyor advising them of any monuments within or adjacent to the UDOT ROW that may be destroyed during construction.

5L2 ROW With Limitations

Overview

This task is used to track the status and progress of parcels needed for construction that have limitations placed on them after a project has been advertised.

References

UDOT Right-of-Way Division Website

UDOT Acquisition Services

Deliverables & Tasks

I. 5L2 TASK INSERTED IN SCHEDULING SOFTWARE

A. Enter 5L2 into Scheduling Software

1. Once it has been determined that a project will be advertised with Right of Way Limitations, the Project Manager will insert 5L2 into the project schedule.
2. This task should be placed after 5Z2 - Submit for Advertisement.
3. The responsible resource for this task is the Central ROW Lead Agent.
4. The duration of this task will be based on the limitation and dates provided in the 00555 Specification that show the Committed Date to clear the right-of-way on all parcels.
5. Central ROW Lead will update the EPM ROW Module to show the limitations date.

II. SIGNED ROW CERTIFICATION (SEE 5L1)

A. Complete ROW Acquisition Process

1. For each parcel that has not been cleared, Central ROW will continue the Acquisition Process as outlined under 4L3 to obtain either a signed ROW Contract or a Right of Occupancy.
2. All deadlines provided in the 00555 Specification must be adhered to in order to prevent any and all ROW delay claims.

B. Cleared ROW for Construction

1. Once every parcel that was advertised with limitations has been cleared for construction, Central ROW will prepare and submit a signed ROW Certification clearing the project of all ROW Limitations.
2. Follow 5L1 process for Right-of-Way Certification.

MATERIALS

2M1 Develop Pavement Design & Report

Overview

Evaluate the existing pavement condition and compare the results of the evaluation to the existing conditions documented in the concept phase preliminary pavement design. Evaluate the existing pavement conditions to assess the level of pavement design needed if a concept pavement design is not available. Confirm the concept report pavement design remains applicable and update or create the pavement design.

References

Pavement Design Manual of Instruction

UDOT Pavement Management Manual

UDOT QC/QA Documentation

Deliverables & Tasks

I. PAVEMENT DESIGN REPORT

A. Review Concept Report

1. Review existing conditions report and pavement design if concept report exists.

Pavement Scope

- Testing strategy used

- Proposed design life

- Additional testing required from testing strategy

- Potential material sources

Testing

- Core and trench for thickness and condition of existing pavement

- Extraction/gradation on cores

- Strength and stripping tests

- Trench for sub-base and subgrade samples

- Concrete pavement evaluation

- Falling Weight Deflectometer testing

- GPR testing

Centerline Soil Survey Report

- California Bearing Ratio

- Soil Classification-Plastic Limit

- Liquid Limit

- Plastic Index

- Soluble Salts

- Resistivity

- pH

- Identify and determine mode(s) of failure for the existing pavement

- Evaluate the need for under drains and coordinate with the project

- Hydraulic Engineer

- Review pavement design options used

- Review engineering and economic analysis of options

- Verify the design is the best option

- Look at updated traffic data to verify that the pavement design remains applicable

B. Determine Existing Pavement Conditions

1. Do the following if the preliminary pavement design exists:
 - Conduct a field review to determine the validity of the pavement conditions assumed in the preliminary pavement design.
 - Conduct a field review according to the instructions for a non-existent preliminary pavement design found below if the current pavement conditions are not consistent with those assumed in the preliminary pavement design.
2. Do the following if the preliminary pavement design does NOT exist:
 - Conduct a field review to determine the existing pavement conditions.
 - This review will be used in developing the pavement design.
 - Determine the condition of the existing pavement following the Pavement Management Manual
 - Research the pavement history
 - Supplement the data by obtaining and testing additional cores if needed.
 - Obtain and test soil samples for full-depth pavement sections
 - Develop a preliminary testing strategy and submit to the Region Pavement Manager for acceptance. Consider the following tests:
 - Falling weight deflectometer or structural measurements
 - Rut measurements, ride index, and cracking type and extent
 - Skid index
 - Traffic data (i.e. traffic projections)
 - Ground penetrating radar
 - Perform and document appropriate tests
 - Determine the pavement type using the following steps:
 - Check Regional Corridor determination list
 - Pavement design analysis with project specific constraints
 - Life cycle analysis and other economic concerns
 - Engineering analysis
 - Evaluate possible project pavement alternatives based on existing pavement conditions
 - Reconstruction vs. Repave
 - Cost of alternatives
 - Design Life
 - Maintenance

C. Write Pavement Design Report (Perform QC Review BEFORE this task)

1. Provide a detailed report of the pavement design according to the Pavement Design Report Template (appendix to UDOT Pavement Manual).
 - Project location / description
 - Existing pavement conditions
 - Subgrade conditions
 - Traffic Data
 - Alternate Pavement Designs Considered
 - Final Pavement Design(s)
 - Additional Recommendations
2. Provide the QC checked Pavement ME pdf printouts, the Pavement ME files, and the traffic files used for each final pavement design as an addenda to the Pavement Design Report unless approved by the Pavement Engineer.

D. Obtain Region Pavement Engineer Approval

1. Submit and obtain approval for the Pavement Design Report from the Region Pavement Engineer.

II. PAVEMENT ME FILE(S)

A. Develop Pavement Design

1. Follow the Pavement Design Manual of Instruction
2. The Pavement Engineer may approve an alternate methodology for local government projects.

III. QC DOCUMENTATION

A. Perform QC Review (Perform BEFORE "Write Pavement Design Report")

1. Perform the QC Review as outlined in the Pavement Design Manual.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the Materials Design QC Checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.
 - Save final pavement design and supporting documentation into ProjectWise.

PUBLIC INVOLVEMENT

1P1 Develop Initial Public Involvement (PI) Plan

Overview

Create a PI plan for the design phase based on the UDOT template. Include key messages, project stakeholders, commitments made to stakeholders in previous project phases, a project team communication plan, proposed media outreach (including social media) for the project, a public participation plan (including Title VI compliance) and a schedule. Tailor the PI plan to the project and include only items and detail as needed.

References

Public Involvement Resources and Templates

UDOT Project Outreach Planner (POP)

UDOT Team Building Guide

UDOT QC/QA Documentation

UDOT Public Participation Plan

Deliverables & Tasks

I. INITIAL PI PLAN

A. Develop POP and PI Plan

1. Develop a PI Plan that reflects the project's POP level. Coordinate with the Project Manager, Design Lead, Right-of-Way Lead, and Region Utility and Railroad Leader to determine the anticipated level of impact to the stakeholders (e.g. traffic control, property impacts, utility stakeholders, key project milestones).
2. Include the following elements in the plan:

- Project type

- Design target dates

- Design contacts

- A brief project description that includes the following:

 - An overview of other projects in the area

- Milestones

- Key messages

- Any commitments made from previous project phases

- Design elements or considerations that could be influenced by PI

 - Sidewalks, Driveway locations, Crosswalks, Construction maintenance of traffic, etc.

- Communication plan, include the following at a minimum:

 - Internal communications plan

 - Public Notification & Participation Plan, focusing on Title VI requirements

 - How comments will be collected and addressed

 - Address other communication needs

- A list and schedule for PI activities (see below for details)

- A list of group and individual project stakeholders

B. Develop PI Activities Schedule

1. Complete the following and include in the PI plan:
 - Develop a list of tasks for the project based on the scope of work.
 - Identify target groups for each task.
 - Determine the purpose and goal of each task.

Identify target deadlines and/or project milestones associated with tasks, as applicable.

C. Update/Create Stakeholders List

1. Update or create the UDOT stakeholder management database.

Locate any existing stakeholder databases for the area.

Include all known contact information.

Identify underserved populations and languages and make sure they are included in the stakeholder databases.

Identify potential key stakeholders and verify information.

Include previous comments and key concerns if applicable.

D. Develop Media Outreach Plan

1. In consultation with the Region Communications Manager, determine the level of media outreach required.

Address need for press releases

Address need to purchase advertising

2. Identify media outlets and primary contacts, including non-English speaking media.

3. Consider a press release announcing the approval of the environmental document.

E. Work with the Project Manager to Determine Need for and Magnitude of Contractor Incentives

1. Incentives are based on potential impacts to businesses, commuters, and residents:

Consider the need for a stakeholder committee and inclusion of associated specifications.

If needed, determine the makeup of the stakeholder committee.

Estimate the cost of the incentive program.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Public Involvement QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4P1 Revise/Implement Public Involvement Plan

Overview

Enhance or implement the project's PI plan to prepare for design based on the project needs. Activities during this phase set the stage for efficient and effective public outreach.

References

Public Involvement Resources and Templates
UDOT Project Outreach Planner (POP)
UDOT Team Building Guide
UDOT QC/QA Documentation
UDOT Public Participation Plan

Deliverables & Tasks

I. REVISED PI PLAN

A. Update POP and PI Plan

1. Working closely with the Region Communications Manager, update the project POP and project PI plan.
2. Coordinate with the Project Manager, Design Lead, Right-of-Way Lead, and Region Utility and Railroad Leader to determine the anticipated level of impact to the stakeholders (e.g. traffic control, property impacts, utility stakeholders, key project milestones).
3. Update the following elements as needed based on the revised scope:
 - Project type
 - Design target dates
 - Design contacts
 - Brief project description including:
 - An overview of other projects in the area
 - Milestones
 - Any commitments made from previous project phases
 - Design elements of considerations that could be influenced by PI.
 - Sidewalks, Driveway locations, Crosswalks, etc.
 - Communication plan, include the following at a minimum
 - Background, challenges and goal
 - Key messages
 - Internal communications plan
 - Public Notification & Participation Plan, focusing on Title VI requirements
 - How comments will be collected and addressed
 - Address other communication needs
 - A list and schedule for PI activities (see above for details)
 - A list of group and individual project stakeholders

B. Update Media Outreach Plan

1. Keep in mind that all media and social media outreach is under the direction of, and coordinated with, the Region Communications Manager.
2. Update media outlets and primary contacts, including non-English speaking news outlets.
3. Revise the level of media outreach required.
 - Review need for press releases

Review need to purchase advertising

C. Draft and Distribute Press Release (as needed)

1. Keep in mind that all media and social media outreach is under the direction of, and coordinated with, the Region Communications Manager.
2. Assist with creating and distributing press release information to local and regional media, including non-English-speaking media..

Draft the press release that notifies the public of the start of the project and provides project team contact information as needed.

Have press releases translated into different languages, as needed.

Distribute to the Region Communications Manager or the UDOT Communications office to be distributed to publications.

3. Identify local and regional print, television, and radio contacts, including non-English-speaking media, for project information distribution.

D. Update Stakeholders List

1. Update the stakeholders list based on new information.

Coordinate with the ROW Design team to determine if any stakeholders have changed.

Coordinate with the Design Leader to determine if any stakeholders are to be eliminated or added to the list based on design updates.

Identify underserved populations and languages and make sure they are included in the stakeholder databases.

Identify key stakeholders.

Update stakeholder comments and concerns.

E. Update PI Activities Schedule

1. Update the PI activities schedule based on decisions and updates to the project design:

Update the list of tasks for the project based on the revised scope of work.

Update/identify target groups for each task.

Update/determine the purpose/goal of each task.

Update/determine the completion date/time frame of each task.

Update the level of stakeholder involvement.

Make sure the region Communications Manager is updated on all of the above.

F. Develop Project Identity and Branding

1. Under the direction of the region Communications Manager, develop project identity and branding according to UDOT's latest standards and guidelines based on POP level.

2. Verify all information is correct before production.

Develop a project logo

Develop project identity templates

Develop project business/contact cards

Develop other outreach and branding materials such as door hangers, fact sheets, magnets, or postcards

Develop materials in as many different languages as is deemed necessary through stakeholder identification.

Develop materials for the visually impaired.

G. Develop Project Website and/or Summary Page

1. Under the direction of the region Communications Manager, develop a project website that is ADA compliant and link to the appropriate web pages and servers.

2. Send regular updates to UDOT personnel (affected RCM(s) and Central Communications) if no website is required.
- H. Develop Stakeholder Committee (if needed)
1. Include region Communications Manager in discussions with PM to determine whether some type of stakeholder committee would be appropriate for the project.
 - Determine potential members, with a focus on diversity, equity and inclusion.
 - Ensure inclusion of associated specifications within the design plan set.
 - Develop a plan for meetings.
 - Invite members and aid in establishing their roles, including voting for any committee leadership.
- I. Develop and Distribute Project Outreach Materials
1. Develop all project outreach materials in accordance with UDOT's latest style guide and standards.
 - Develop and hand out information sheets to stakeholders in as many different languages as is deemed appropriate through stakeholder identification.
 - Develop materials for the visually impaired.
 - Develop and send electronic news updates to news agencies such as local papers or special publications.
 - Develop and mail newsletters to stakeholders.
 - Verify all materials and messages are consistent with each other.
 - Verify the design is the latest version if the project design is used.
- J. Attend Public Activities and Meetings to Provide Project Information
1. Prepare and present project information to city councils, chambers of commerce, and neighborhood meetings.
- K. Civil Rights and Title VI Checklist, Summary, and Project Evaluation Forms
1. Complete the Civil Rights and Title VI Checklist, Summary, Project Evaluation and Data Collection Forms for each public meeting
 2. Upload the forms into ProjectWise
- L. Communicate with Stakeholders
1. Constant communication with stakeholders is necessary for a successful project.
 - Respond to and document stakeholder comments.
 - Follow up on commitments made to the stakeholders; document follow up actions.
 - Provide updates for project milestones to interested stakeholders/general public.
 - Hold one-on-one meetings with stakeholders, as needed.
 - Keep the region Communications Manager up-to-date with stakeholder communications and comments.

II. PI TRANSITION HANDOFF PACKAGE (PS&E STAGE ONLY)

- A. Compile PI Transition Handoff Package
1. If the PI team will change from design phase to construction phase, a smooth transition is crucial to maintaining the reputation and relationships cultivated between stakeholders and UDOT.
 2. Compile all developed PI items, tools, and information to be handed over to the construction PI personnel.

3. Prepare the package so that the construction PI personnel will understand the PI decisions, communications, and work done during the design process.
4. Include the following:
 - List of PI contacts for utilities
 - All local government contacts that may be performing work in the area
 - Stakeholder contact list, including identification of underserved populations and Limited English Proficiency (LEP) needs.
 - Final Design Phase PI Report
 - Applicable ROW records
 - MOT plans

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Public Involvement QC Checklist before distribution.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the QC checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

DRAINAGE

1Q1 Assess Drainage Needs & Scope

Overview

Review existing conditions and develop recommendations for improvements for drainage and stormwater quality.

References

UDOT Drainage Manual of Instruction
UDOT Stormwater Quality Design Manual
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY DRAINAGE SUMMARY

A. Review Existing Drainage Information

1. Locate any information about the project area that could include, but is not limited to the following:

- As-built plans
- Local government master plans
- FEMA flood maps
- Utah Division of Environmental Quality interactive map
- Agreements

B. Conduct Drainage Field Review

1. Perform a field review of the site to assess the location, material type, geometry, system operation, and condition of existing drainage features.
2. Evaluate and document the following:

- Drainage patterns
 - Waters of the State
 - Outfall locations
 - Offsite flows to the project area
 - Conveyance methods
 - Locations of discharge points
 - Locations of adjoining connections from offsite areas

Drainage problems

- Ponding
- Excessive spread
- Erosion

Bridges

- Approach slab and deck drains
- Channel stability and scour

Culverts and storm drain systems

- End treatments (i.e. end sections and headwalls)
- Connectivity
- Sediment and debris potential
- Condition

- Suitability for extension
- Suitability for rehabilitation
- Need for replacement

- Long term stormwater quality BMPs
- Flood control features

- Ditches
- Channel stability
- Energy dissipation measures

C. Conduct Irrigation Field Review

1. Meet with the irrigation company and operators of the irrigation system to perform a field review of the project site.
2. Assess the location and condition of existing irrigation features. Evaluate and document the following:

- Irrigation patterns
- Maximum operational flows
- Irrigation season
- Conveyance methods
 - Locations of diversion structures and flow measurement devices.
 - Locations of adjoining connections from offsite areas
- Irrigation features (i.e. channels, pipes, boxes).
 - Size
 - Connectivity
 - Method of diversion
 - Condition
 - Suitability for extension
 - Suitability for rehabilitation
 - Need for replacement

D. Coordinate with Maintenance Team

1. Attend the Maintenance/Pre Construction site-visit
- See 1Y2 and 1R1 Maintenance Site Visit Form

E. Provide Preliminary Drainage Summary for Scoping Meeting

1. Include the following:
 - Condition of existing drainage features.
 - Potential project impacts that could affect the scope, schedule and budget.

II. PRELIMINARY STORMWATER QUALITY SUMMARY

A. Determine Status of Existing Stormwater Quality Features

1. Coordinate with the Region Stormwater Coordinator to determine if the project area is being considered for an existing stormwater retrofit plan.
 - If so, determine the intent of the retrofit plan so that the project design is compatible.
2. Conduct a field visit or coordinate with the Region Stormwater Coordinator to determine if there are existing stormwater quality features that are currently failing or inadequate at the project site.

B. Determine Impairment Status of Receiving Waters

1. Determine if the project's receiving waters are 303(d) listed for impairments:
 - Utah Division of Environmental Quality Interactive Map
2. Determine if a Total Maximum Daily Load (TMDL) has been developed for the receiving waters:
 - Utah Division of Environmental Quality Interactive Map
3. If a TMDL has been developed and UDOT is a listed contributor, determine the associated requirements:
 - Utah Division of Water Quality: Approved TMDLs

C. Develop Stormwater Quality Design Criteria

1. Determine the governing criteria for the project's stormwater quality by referring to UDOT Stormwater Quality Design Manual.
 2. The stormwater quality design criteria must be compatible with the project's drainage design criteria and take similar considerations.
 3. See UDOT's Stormwater Quality Design Manual for a list of:
 - Project types that do not require retention of the volume generated by the 80th percentile, 24-hour storm event.
 - Site conditions that may result in retention being technically infeasible.
- D. Provide Initial Stormwater Quality Design Documentation for Scoping Meeting
1. The initial Stormwater Quality Design Documentation will include the following information:
 - Total acres of land disturbance.
 - A summary of the project's receiving water's impairments.
 - Obtain information related to site conditions to assess potential for infiltration of runoff.
 - Status of existing stormwater quality features.
 - Statement of whether the project is required to retain the 800th percentile, 24-hr storm volume.
 - Risks and technical infeasibilities that may limit stormwater quality design implementation.

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Drainage Design QC Checklist before distribution.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the QC checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

2Q1 Develop Initial Drainage Design

Overview

Develop preliminary drainage design.

References

Preliminary Drainage Summary (1Q1)
UDOT Digital Delivery Website
UDOT Drainage Manual of Instruction
UDOT Stormwater Quality Design Manual
UDOT QC/QA Documentation
Masterworks

Deliverables & Tasks

I. DRAINAGE DESIGN CRITERIA

A. Develop Drainage Design Criteria

1. Determine the governing criteria for the project's drainage design by referring to UDOT Drainage Manual of Instruction and UDOT Stormwater Quality Design Manual.
2. Document all assumptions, approach, and deviations to drainage design criteria.
3. Determine if permits and/or agreements are required.

II. INITIAL DRAINAGE SYSTEM LAYOUT (FOR INITIAL ROADWAY MODEL 2R1)

A. Perform Hydrologic Analysis

1. Identify methodologies to estimate design flows.
2. Determine the following:
 - Design frequency and precipitation
 - Land use and soil characteristics (as needed)
 - Contributing drainage areas
 - Time of concentration

B. Perform Hydraulic Analysis

1. Identify methodologies for hydraulic analysis.
2. Determine the following, hydraulic results, as needed or as relevant to the project needs:
 - Velocity, capacity, and spread
 - Storage and channel routing
 - Retention volumes, detention volumes
 - Scour
 - Riprap
 - Water surface elevation

C. Develop Preliminary Drainage System Design Layout

1. Identify all necessary drainage features based on proposed and existing conditions of the roadway elements such as recommended horizontal/vertical alignments and existing drainage systems.
2. Identify conveyance methods (e.g., sheet flow, ditch, storm drain system).
3. Determine and evaluate any constraints that could affect the layout of drainage features.
4. Estimate the size and location of flood control features.
5. Incorporate applicable environmental commitments and permit requirements

6. Estimate the size, location and feasibility of permanent long-term stormwater quality BMPs
7. Determine and evaluate any constraints that could affect the layout of irrigation features.

D. Conduct Conflict Analysis

1. Identify potential conflicts with other design elements.
2. Identify potential conflicts with existing and proposed utilities.
3. Identify design elements inside roadway clear zone.
4. Identify design elements outside the project ROW.

E. Coordinate with Project Team Members

1. Coordinate the drainage design with the project team and other disciplines as necessary to ensure compliance with UDOT standards and requirements.
2. Coordinate and mitigate project design conflicts, risks and impacts.

III. STORMWATER QUALITY DESIGN DOCUMENTATION

A. Develop Preliminary Layout of Stormwater Quality BMPs

1. Determine and evaluate any constraints that could affect the feasibility of stormwater quality BMPs.

B. Determine Locations of Percolation Tests for Stormwater Quality BMPs

1. Determine appropriate test hole locations for stormwater quality BMPs.

C. Develop Stormwater Quality Documentation

1. The Stormwater Quality Documentation is to be submitted at each project phase for review.
2. If a Drainage Report is submitted, the Stormwater Quality Documentation is to be submitted as an appendix.

IV. PRELIMINARY DRAINAGE COST ESTIMATE

A. Develop Preliminary Drainage Cost Estimate

1. Compile initial drainage bid items and quantities.
Use UDOT standard bid items.
2. Develop unit costs for each item.
Use appropriate resources for developing unit costs such as Masterworks.
Document unit cost development and assumptions.
Account for project specific factors:
 - Location
 - Time of year
 - Limitations of operation
 - Quantity of item
 - Current bidding environment
 - Availability of materials
 - Familiarity of process
 - Specialty equipment
 - Risk to contractor
 - Inflation
 - Construction Schedule
 - Constructability

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Drainage Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3Q1 Complete Drainage Design

Overview

Complete design of the drainage features and stormwater quality features.

References

UDOT CADD Standards

UDOT Drainage Manual of Instruction

UDOT Plan Sheet Development Standards

UDOT Digital Delivery Website

UDOT Stormwater Quality Design Manual

UDOT Standard Drawings and Standard Specifications and Special Provisions

UDOT QC/QA Documentation

Deliverables & Tasks

I. DRAINAGE SYSTEM DESIGN

A. Address Geometry Review Comments

1. Complete the drainage portions of the Geometry Review Comment Resolution Form.

Respond to each drainage related comment.

Make revisions to the design and deliverables in accordance with the responses.

Conduct QC Review and Verification of all comments.

2. See UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Complete Drainage Design

1. Complete the design of the drainage features in accordance with UDOT Drainage Manual of Instruction and UDOT Stormwater Quality Design Manual.

C. Identify Potential Design Conflicts

1. Identify design conflicts such as utilities, roadway, and ROW with proposed drainage features.
2. Coordinate with other disciplines to evaluate design alterations to mitigate conflicts.

II. PRELIMINARY DRAINAGE PLAN & PROFILE SHEETS

A. Prepare Preliminary Drainage Plan and Profile Sheets

1. Follow the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website to develop preliminary plan sheets for review.
2. Include all information necessary for review including callouts and notes.

III. DESIGN WAIVERS AND DEVIATION FROM STANDARDS ON PDC FORMS (IF NECESSARY)

A. Submit Design Waivers and Deviation from Standards on PDC Forms for Approval (if necessary)

1. Complete and submit design waivers and deviation from standards on PDC forms.
2. Work with the Region Preconstruction Engineer or Region Hydraulics Engineer to obtain approvals.

IV. DRAINAGE COST ESTIMATE

A. Update Drainage Cost Estimate

1. Update drainage bid items and quantities.
2. Update drainage unit costs (see 2Q1).

V. DRAFT DRAINAGE REPORT

A. Prepare Draft Drainage Report

1. Prepare Draft Drainage Report and include necessary drainage elements and data for the project according to the UDOT Drainage Manual of Instruction and UDOT Stormwater Quality Design Manual.
2. Document all design assumptions, approach and deviations in the Drainage Report.

VI. STORMWATER QUALITY DESIGN DOCUMENTATION

A. Complete Stormwater Quality Design (Appendix to Drainage Report)

1. Complete the stormwater quality design compatible with drainage design according to UDOT Stormwater Quality Design Manual.
2. Add stormwater quality design calculations and documentation to the appendix of the Drainage Report.

VII. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Drainage Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4Q1 Complete Drainage Plan Sheets & Documents

Overview

Revise the drainage design based on the plan-in-hand review. Complete drainage plan set and documents. Finalize the drainage report.

References

UDOT CADD Standards

UDOT Drainage Manual of Instruction

UDOT Stormwater Quality Design Manual

UDOT Plan Sheet Development Standards

UDOT Digital Delivery Website

UDOT Specification Writer's Guide

UDOT Standard Drawings and Standard Specifications and Special Provisions

UDOT QC/QA Documentation

Masterworks

Deliverables & Tasks

I. DRAINAGE PLAN SHEETS

A. Address Plan-in-Hand Review Comments

1. Address the drainage comments in the Plan-in-Hand Review Comment Resolution Form, and revise according to resolutions.
2. See UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Complete Drainage Plan and Profile Sheets

1. Conform to the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website.
2. All information on the sheets must go through the QC review procedure before distribution.

C. Complete Drainage Detail Sheets

1. Conform to the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website.
2. Complete all details necessary for construction of the project.

D. Complete Drainage Summary Sheets

1. Prepare summary sheets according to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website and Summary Sheet CADD Standards.
2. Use UDOT Excel spreadsheets and customize for the project.
 - Include all drainage and water quality related pay items .
 - Include names, alignment designations, stations, offsets, units, and quantities.
 - Show enough detail to support calculations.

II. DRAINAGE COST ESTIMATE

A. Finalize Drainage Cost Estimate

1. Update drainage and stormwater quality bid items and quantities.
2. Update drainage unit costs. (see 2Q1)

B. Enter Drainage Cost Estimate into Masterworks

III. DRAINAGE PROJECT DOCUMENTS

A. Complete Drainage Project Documents

1. Provide drainage special provisions required:

General Special Provisions

Project Specific Special Provisions

Use UDOT Specification Writer's Guide

2. Enter drainage pay items into Masterworks to generate Measurement and Payment (M&P)

Enter M&P for non-standard drainage bid items.

IV. DRAINAGE REPORT

A. Finalize Drainage Report

1. Finalize the drainage report according to the UDOT Drainage Manual of Instruction and the UDOT Stormwater Quality Design Manual.

V. STORMWATER QUALITY DESIGN DOCUMENTATION

(AS APPENDIX TO DRAINAGE REPORT)

A. Complete Stormwater Quality Design Documentation

1. Use the current Stormwater Quality Design Documentation Template

VI. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review for new and modified deliverables following the UDOT QC/QA Procedures and the Drainage Design QC Checklist before distribution.

ROADWAY

1R1 Develop Roadway Scope

Overview

Determine the preliminary project footprint.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
Active Transportation Facility Implementation Tool (ATFIT)
UDOT Active Transportation Plan Map
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
UDOT Plan Sheet Development Standards Manual (PSDS)
UDOT CADD Standards Manual
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings (DM Drawings)
UDOT Standard Specifications and Standard Drawings
UDOT Digital Delivery Website
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Signalized Intersection Design Manual
UDOT Roadway Lighting Design Guidelines
UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY FOOTPRINT REVIEW DRAWING OR MAP

A. Assess Existing Conditions

1. Conduct a field review to assess existing roadway conditions.
2. Attend the Maintenance/Pre Construction site-visit (see 1Y2).
3. Obtain as-built information, if available.
4. Request and obtain a Project Safety Analysis (PSA) and identify safety needs.
5. Meet with maintenance onsite and identify existing deficiencies

Geometry

Signing and Striping

Safety

Lighting

Drainage

Active Transportation

Transit

B. Develop Strategy to Address Deficiencies

1. Identify roadway related deficiencies.
2. Identify improvements to correct deficiencies.

C. Review Multimodal Needs

1. Review the Active Transportation Facility Implementation Tool (ATFIT) completed during concept. Design and implement all UDOT projects so that all users have access to safe, comfortable, and convenient healthy transportation choices on Utah's transportation network.
2. Coordinate with Active Transportation Manager, and Transit Engineer to do the following:

- Assess multimodal needs
- Review UDOT Active Transportation Plan Map
- Coordinate with local municipalities and transit agencies
- Assess access and connectivity to transit stations and stops..
- Assess pedestrian connectivity and safety needs.

D. Develop Preliminary Typical Section

1. Develop preliminary existing and proposed typical sections to identify the project footprint.
 - Conform to the Project Design Certification (PDC).
 - Show the existing/proposed roadway width.
 - Coordinate pavement section with Pavement Engineer

E. Prepare Preliminary Project Footprint Drawing or Map

1. Following the PDC and project concept, do the following:

- Determine Preliminary Project Footprint.
 - Use the concept report, existing conditions, and preliminary project scope
 - Use the preliminary typical sections to determine preliminary estimated cut/fill lines

Coordinate with the following disciplines to identify potential impacts.

- Environmental
- Right-of-Way
- Drainage
- Structures
- Utilities
- Traffic and Safety
- Planning
- Maintenance

If survey is available, develop preliminary horizontal and vertical alignments of main and secondary roads if possible.

Follow design standards

- See 2R1 for more information

2. Prepare a drawing or map in the format determined by the Project Manager showing the preliminary project footprint.

- Include the proposed preliminary project footprint.
- Include known existing topography.
- Include known ROW and easements (existing and proposed).
- Include available preliminary horizontal and vertical alignments.
- Include additional relevant information to facilitate reviews.
- Label items necessary for clarity or to highlight for discussion.

II. PRELIMINARY ROADWAY COST ESTIMATE

A. Develop Preliminary Roadway Cost Estimate

1. Compile initial roadway bid items and quantities.
 - Use UDOT standard bid items
 - Develop Special Provisions for non-standard bid items.

2. Develop unit costs for each item.

Use appropriate resources for developing unit costs such as:

Masterworks

UDOT Constructibility and Estimating Support

Local contractors

Document unit cost development, cost discussions, and assumptions.

Account for project specific factors:

Location

Time of year

Limitations of operation

Quantity of item

Current bidding environment

Availability of materials

Familiarity of process

Specialty equipment

Risk to contractor

Inflation

Construction Schedule

Constructability

Engineering Estimates in Masterworks can only be entered with a project in Active Status within ePM.

3. Use lump sum pricing only when appropriate.

Consider contractor risk due to unknown quantity

Consider difficulty in pricing per unit

Consider all materials and labor involved

QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

2R1 Model Initial Roadway Design

Overview

Determine the recommended horizontal and vertical alignments by developing the initial roadway model.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
UDOT Plan Sheet Development Standards Manual (PSDS)
UDOT CADD Standards Manual
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UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
UDOT QC/QA Documentation
Masterworks

Deliverables & Tasks

I. RECOMMENDED ALIGNMENTS REVIEW DRAWING OR MAP

A. Determine Recommended Horizontal and Vertical Alignments

1. Determine the recommended horizontal and vertical alignments based on discussions with reviewers, input from other disciplines, and the initial roadway model.

The final horizontal and vertical alignment design is iterative and may require multiple revisions during the development of the roadway model.

2. Do the following to determine the horizontal and vertical alignments:

Coordinate with the following disciplines to determine potential conflicts, deficiencies, and impacts.

Environmental
Right-of-Way
Maintenance
Drainage
Structures
Utilities
Traffic and Safety
Planning

Conform to horizontal and vertical alignment design standards.

B. Develop Initial Roadway Model

1. Develop templates to represent specific project conditions.

2. Develop the roadway model based on templates.
- C. Analyze Roadway Design
1. Compliance with the PDC
 - Identify additional design exceptions and deviations from standards
 2. Coordinate with Drainage Design
 - Surface ditches
 - Superelevation transitions
 - Flat spots
 - Low points
 3. Feasibility of driveway connections
 4. Traffic signal sight distance
 5. Coordinate with Region Materials Engineer for Material availability and identification:
 - Identify commercial material sources
 - Identify state-owned pits
 - Investigate quality of material from the possible materials sources (if applicable)
 - Identify clearances necessary to use the possible materials sources (if applicable)
- D. Prepare Recommended Alignments Review Drawing or Map
1. The review drawing or map provides reviewers with the initial roadway design, specifically the recommended horizontal and vertical alignments.
 - Prepare the drawing or map following guidance from UDOT RDM , QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format appropriate for the Geometry Review Meeting
 - Provide the review drawing or map to the Design Leader for distribution to all reviewers.

INITIAL PDC FORM

- A. Submit Project Design Certification
1. Complete and submit the initial PDC form.
 2. Coordinate with the Region Preconstruction Engineer and necessary disciplines to review known exceptions and deviations.

ROADWAY COST ESTIMATE

- A. Update Roadway Cost Estimate
1. Update roadway bid items and quantities.
 2. Update roadway unit costs (see 1R1)

QC DOCUMENTATION

- A. Perform QC Review
1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

3R1 Complete Roadway Design

Overview

Finalize the roadway model and design. Modify the design based on reviewer comments and continued coordination with project team members. Modify the design as necessary to include other discipline needs like drainage facilities, utilities, signal, signs, and ITS. Create preliminary roadway plan sheets or Digital Model Files.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
UDOT Plan Sheet Development Standards Manual (PSDS)
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UDOT Signalized Intersection Design Manual
UDOT Roadway Lighting Design Guidelines
UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
UDOT QC/QA Documentation
Masterworks

Deliverables & Tasks

I. PRELIMINARY ROADWAY PLAN & PROFILE SHEETS OR DIGITAL MODEL FILES

A. Address Geometry Review Comments

1. Complete the roadway portions of the Geometry Review Comment Resolution Form.

Respond to each roadway related comment.

Make revisions to the design and deliverables in accordance with the responses.

Conduct QC Review and Verification of all comments.

2. Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Coordinate with Project Team Members

1. Continually coordinate with project team members.

Discuss aspects of the model and design with appropriate disciplines to ensure compliance with standards, with other designs, and address fatal flaws.

Coordinate and mitigate project design conflicts, impacts, and deficiencies.

C. Complete Roadway Design

1. Refer to UDOT and AASHTO design standards to finalize the roadway design.

Finalize the roadway model based on templates.

Follow requirements listed on the UDOT Digital Delivery Website.

D. Develop Preliminary Roadway Plan and Profile Sheets

1. Follow the current UDOT CADD Standards, UDOT PSDS and UDOT Digital Delivery Website to develop roadway plan and profile, or digital model files, for review.
2. Prepare the sheets or digital model file following guidance from UDOT RDM , QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the Plan-in-Hand Review Meeting.
3. Follow the UDOT Digital Delivery Website for all Digital delivery projects
4. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

II. PRELIMINARY TYPICAL SECTION PLAN SHEETS: INCLUDE TYPICAL SECTIONS IN DIGITAL MODEL, IF NEEDED

A. Develop Preliminary Typical Sections

1. Create typical section plan sheets and include all typical sections for projects advertising with plan sheets. Develop typical sections as needed for Digital Delivery projects.

III. DESIGN EXCEPTIONS AND DEVIATIONS FROM STANDARDS ON PDC FORM (IF NECESSARY)

A. Submit Project Design Certification for Review

1. Complete and submit Project Design Certification to include any deviations from standards, design exceptions, and Traffic & Safety approvals.
2. Work with the Region Preconstruction Engineer to coordinate with necessary parties for approval at PS&E.

IV. ROADWAY COST ESTIMATE

A. Update Roadway Cost Estimate

1. Update roadway bid items and quantities.
2. Update roadway unit costs (see 1R1).
3. Have the estimate reviewed by UDOT Constructability and Estimate Support.

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

3R2 Complete Signing & Striping Design

Overview

Using the roadway model as a guide, develop the signing and striping design for the project. Locate appropriate sites for placement of overhead sign structures (if applicable). Develop Maintenance-of-Traffic (MOT) design. Develop preliminary signing, striping, and MOT plans.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
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UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY SIGNING AND STRIPING PLANS

A. Develop Signing and Striping Design

1. Use UDOT RDM, UDOT Standard Drawings and UDOT approved MUTCD to develop signing and striping design.
2. Do the following for signing design:
 - Coordinate with the Region Traffic Engineer for approval of interstate guide signs by Central Traffic and Safety Division.
 - Review for compliance with MUTCD.
 - Consider signs that may be required outside of the project limits.
 - Work with Region Traffic and Safety Engineer to decide which existing signs to replace, modify, or upgrade where necessary.
3. Do the following for striping design:
 - Base the striping plan on capacity analysis.
 - Design lane widths and intersection layouts as per the UDOT RDM.
 - Note pavement marking type.

B. Create Preliminary Signing and Striping Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT PSDS or the UDOT Digital Delivery Website to create signing and striping plans for review.

2. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the Plan-in-Hand Review Meeting.
3. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

II. OVERHEAD SIGN LOCATIONS (AS NECESSARY)

- A. Identify Overhead Sign Locations
 1. Refer to the MUTCD and UDOT Sign Manual to determine the locations of overhead sign needs.
- B. Determine Cantilever or Full Span
 1. Determine the placement and type of structure based on recommendations from the structural design engineer and the Structures Division requirements found in the UDOT SDDM.
- C. Produce Cross-Section to Determine Vertical Clearance
 1. Provide vertical clearances according to the Structures Division requirements. These requirements can be found in the UDOT SDDM.
- D. Determine Barrier Needs/Foundation Protection
 1. Evaluate the clear zone requirements and need for barrier/foundation protection.
- E. Determine Power Requirements for Lighting the Overhead Sign
 1. Determine the lighting and power needs for overhead signs and coordinate with the Lighting Designer (3R3).

III. PRELIMINARY MOT PLANS

- A. Complete MOT Design
 1. Using resources that include the UDOT Standard Drawings TC series, MUTCD, and the Work Zone Safety and Mobility Policy UDOT 08-05, to develop the MOT design. Consider the following:
 - Coordinate the detour routes with stakeholders to minimize impacts. These stakeholders could include state agencies, local agencies, and property owners.
 - Provide MOT design for all roadway users including automobiles, trucks, transit, pedestrians, and bikes.
 - Coordinate with the Traffic Engineer to determine user costs.
 - Evaluate the detour alternatives.
 - Review the preferred alternatives with the Region Traffic Engineer.
 - Design project specific custom signs, including dimensions, color, message, and letter size.
 - Determine the VMS sign placement and proposed message.
 - Design the static information sign.
 - Consider the overhead VMS and HAR radio sites.
 - Consider the need to model traffic impacts due to traffic pattern modifications.
 - Coordinate signal timing adjustments with the TOC.
 - If closures are required, do the following:
 - Develop the detour plan for each closure.
 - Place VMS in each direction seven days prior to the closure.

Get approval from the Region Operations Engineer and Region Director.

B. Obtain Closure Approvals (if necessary)

1. Initiate and obtain approval from local agencies or FHWA when applicable.

C. Create Preliminary MOT Plans

1. Follow the current UDOT CADD Standards and UDOT PSDS or the UDOT Digital Delivery Website to create preliminary MOT plan sheets for review. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the Plan-in-Hand Review Meeting.
2. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

IV. SIGNING, STRIPING, & MOT COST ESTIMATES

A. Develop Signing, Striping, and MOT Cost Estimate

1. Follow the current standards to create a project cost estimate for review.
 - Develop signing and striping bid items and quantities.
 - Coordinate with the Structural Engineer to develop overhead sign structure bid items and quantities.
 - Use UDOT standard bid items
 - Develop Special Provisions for non-standard bid items.
 - Develop unit costs for each item.
 - Use appropriate resources for developing unit costs such as Masterworks, UDOT Constructibility and Estimating Support, and local contractors
 - Document unit cost development, assumptions, etc.
 - Account for project specific factors:
 - Location
 - Time of year
 - Limitations of operation
 - Quantity of item
 - Current bidding environment
 - Availability of materials
 - Familiarity of process
 - Specialty equipment
 - Risk to contractor
 - Inflation
 - Construction schedule
 - Constructability
 - Use lump sum pricing only when appropriate.
 - Consider contractor risk due to unknown quantity
 - Consider difficulty in pricing per unit
 - Consider all materials and labor involved

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3R3 Complete Signal & Lighting Layout Designs

Overview

Complete the signal layout design according to the UDOT Signalized Intersection Design Manual. Create preliminary signal plan sheets. Develop the lighting design according to the AASHTO Roadway Lighting Design Guide. Create preliminary plan sheets.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
UDOT Plan Sheet Development Standards Manual (PSDS)
UDOT CADD Standards Manual
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UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY SIGNAL PLAN

A. Identify Signal Requirements

1. Avoid conflicts by coordinating with other disciplines, including utility, roadway, drainage, signing and striping.
2. Identify signal phasing based on the capacity analysis and warrant study.
3. Identify sight distance concerns and coordinate with other disciplines.
4. Coordinate ITS needs with the TOC.
5. Ensure the Americans with Disabilities Act (ADA) accessibility requirements are addressed.
6. Coordinate power source needs and impacts with the local utilities.

B. Layout Signal Design

1. Develop the signal design according to the UDOT Design of Signalized Intersections Manual. Develop transit signal design according to the UDOT Bus Rapid Transit Design Manual.

C. Create Preliminary Signal Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT PSDS or the UDOT Digital Delivery Website to create preliminary signal plan sheets for review.
2. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format

requested by reviewers and a format appropriate for the Plan-in-Hand Review Meeting.

3. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

II. PRELIMINARY LIGHTING PLAN

A. Identify Lighting Requirements

1. Determine the lighting type required by UDOT and the local jurisdiction.
2. Determine luminaire spacing.
Verify illumination through AGI32 lighting software.
3. Identify the ROW needs.
4. Determine power source needs and impacts with the local utilities.

B. Layout Lighting Design

1. Develop the lighting design according to the UDOT Roadway Lighting Design Guidelines and AASHTO Roadway Lighting Design Guide.

C. Create Preliminary Lighting Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT PSDS or the UDOT Digital Delivery Website to create preliminary lighting plan sheets for review.
2. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the Plan-in-Hand Review Meeting.
3. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

III. COOPERATIVE AGREEMENTS (IF APPLICABLE)

A. Assist PM to Develop Cooperative Agreement

1. Assist the PM in developing a cooperative agreement with the local jurisdiction.
2. Refer to Policy and Procedure 06C-06 for maintenance and power cost responsibilities.

IV. REQUEST FOR ROW

A. Request Additional ROW (if needed)

1. Identify the ROW needs and coordinate with the ROW team.

V. SIGNAL AND/OR LIGHTING COST ESTIMATE

A. Develop Signal and/or Lighting Estimate

1. Follow the current standards to create project cost estimate for review.
2. Develop signal bid items and quantities.
Use UDOT standard bid items.
Develop Special Provisions for non-standard bid items.
3. Identify State Furnished and Contractor Furnished bid items.
4. Identify betterment bid items.
5. Develop unit costs for each item.
Use appropriate resources for developing unit costs such as:
Masterworks
UDOT Constructibility and Estimating Support
Local contractors
Document unit cost development and assumptions.

Account for project specific factors:

Location

Time of year

Limitations of operation

Quantity of item

Current bidding environment

Availability of materials

Familiarity of process

Specialty equipment

Risk to contractor

Inflation

Construction schedule

Constructability

6. Use lump sum pricing when appropriate.

Consider contractor risk due to unknown quantity.

Consider difficulty in pricing per unit.

Consider all materials and labor involved.

VI. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

VII. DESIGN ACCEPTANCE

A. Obtain Signal and/or Lighting Design Acceptance

1. Send the signal and/or lighting designs to the Region Traffic and Safety Engineer for review.
2. Submit to Central Traffic and Safety for review and comment.

4R1 Complete Roadway Plans & Documents

Overview

Following UDOT Plan Sheet Development Standards and the UDOT Digital Delivery Website, finalize digital delivery model, complete the roadway plan and profile sheets and create roadway plan summaries, details, and additional plan sheets. Prepare and assemble roadway project documents. Finalize roadway cost estimate.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
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UDOT Signalized Intersection Design Manual
UDOT Roadway Lighting Design Guidelines
UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. ROADWAY PLAN & PROFILE SHEETS OR DIGITAL MODEL FILES

A. Address Plan-in-Hand Review Comments

1. Complete the roadway portions of the Plan-in-Hand Review Comment Resolution Form.

Respond to each roadway related comment.

Make revisions to the design and deliverables in accordance with the responses.

Conduct QC Review and Verification of all comments.

2. See UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form

B. Finalize Roadway Design

1. Finalize the roadway design based on review comments and coordination with team members.

Refer to 3R1 as needed.

C. Complete Roadway Plan and Profile Sheets

1. Follow the current UDOT CADD Standards and UDOT PSDS or the UDOT Digital Delivery Website to complete the roadway plan and profile sheets.

2. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the PS&E Review Meeting.
 3. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.
- D. Complete Typical Section Sheets
1. Finalize all typical sections and complete the plan sheets.
 2. Revise typical sections as needed based on review comments and roadway design revisions.
- E. Complete Roadway Detail Sheets
1. Complete all details necessary for construction of the project.
- F. Complete Removal Plan Sheets
1. Complete removal design necessary for construction of the project.
- G. Complete Grading Plan Sheets
1. Complete grading design necessary for construction of the project.
- H. Complete Roadway Summary Sheets
1. Prepare summary sheets according to UDOT PSDS or UDOT Digital Delivery Website and UDOT CADD Standards.

ROADWAY COST ESTIMATE

- A. Finalize Roadway Cost Estimate
1. Update roadway bid items and quantities.
 2. Update roadway unit prices.
- Refer to 1R1
- B. Enter Roadway Cost Estimate into Masterworks

ROADWAY PROJECT DOCUMENTS

- A. Develop Roadway Project Documents
1. Provide all special provisions required for project construction.
 2. Use Masterworks to generate Measurement and Payment (M&P) for all bid items.

FINAL PDC

- A. Complete PDC
1. Complete PDC and coordinate with the Region Preconstruction Engineer to route for required signatures.

QC DOCUMENTATION

- A. Perform QC Review
1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

4R2 Complete Signing & Striping Plans & Documents

Overview

Following UDOT CADD Standards and UDOT Plan Sheet Development Standards or UDOT Digital Delivery Website, finalize the signing and striping plan set and create summary sheets. Finalize the Maintenance-of-Traffic (MOT) design, models, and plans. Prepare and assemble the signing, striping, and MOT project documents, including measurement and payment, special provisions, and final cost estimate.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
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UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. SIGNING & STRIPING PLAN SHEETS OR DIGITAL MODEL FILES

A. Address Plan-in-Hand Review Comments

1. Complete the signing and striping portions of the Plan-in-Hand Review Comment Resolution Form.

Respond to each signing and striping related comment.

Make revisions to the design and deliverables according to the responses.

Conduct QC Review and Verification of all comments.

2. See UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Design Overhead Sign Layout (if necessary)

1. Layout the sign message.
2. Determine the lighting requirements.
3. Submit the sign layout to the Central Traffic and Safety Division for approval.
4. Coordinate with the Central Structures for sign structure design.

C. Finalize Signing and Striping Design

1. Finalize the signing and striping design based on review comments and coordination with team members.

Refer to 3R3 as needed.

D. Complete Signing and Striping Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT PSDS or the UDOT Digital Delivery Website to finalize the plan sheets.
2. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the PS&E Review Meeting.
3. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

E. Complete Signing and Striping Detail Sheets

1. Complete all details necessary to construct signing and striping design.

F. Complete Signing and Striping Summary Sheets

1. Prepare summary sheets in accordance with UDOT PSDS or the UDOT Digital Delivery Website.

II. MOT PLAN SHEETS OR DIGITAL MODEL FILES

A. Finalize MOT Design

1. Finalize the MOT design based on review comments and coordination with team members.

Refer to 3R2 tasks as needed.

Determine the detour signs, warning signs, and VMS required for MOT.

Conform to all design standards including the MUTCD, UDOT RDM, and UDOT PSDS - MOT Sheet Requirements.

B. Complete MOT Plan Sheets

SIGNING, STRIPING, & MOT COST ESTIMATE

A. Finalize Signing, Striping, and MOT Cost Estimate

1. Update signing, striping, and MOT bid items and quantities.
2. Update the signing, striping, and MOT unit prices.

B. Enter Signing, Striping, and MOT Cost Estimate into Masterworks

C. Develop Signing, Striping, and MOT Project Documents

1. Provide all special provisions required for project construction.
2. Use Masterworks to generate Measurement and Payment (M&P) for all bid items.

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

V. OVERHEAD SIGN APPROVAL

A. Obtain Overhead Sign Approval

1. Submit overhead sign layout to Central Traffic and Safety for approval.
2. Make any revisions required and obtain final approval.

4R3 Complete Signal & Lighting Plans & Documents

Overview

Following UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website, and using templates found on the UDOT Signal and Lighting Design website, complete the signal and lighting plan sheets.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
UDOT Plan Sheet Development Standards Manual (PSDS)
UDOT CADD Standards Manual
UDOT Digital Delivery Website
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings (DM Drawings)
UDOT Standard Specifications and Standard Drawings
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Signalized Intersection Design Manual
UDOT Roadway Lighting Design Guidelines
UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. SIGNAL PLAN SHEETS OR DIGITAL MODEL FILES

A. Address Plan-in-Hand Review Comments

1. Complete the signal and lighting portions of the Plan-in-Hand Review Comment Resolution Form.

Respond to each signal and lighting related comment.

Make revisions to the design and deliverables in accordance with the responses.

Conduct QC Review and Verification of all comments.

2. Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Finalize Signal Layout Design

1. Finalize the signal layout design based on review comments and coordination with team members.

2. Conform to the UDOT Signalized Intersection Design Manual.

Refer to 3R3 tasks as needed.

C. Complete Signal Plan Sheets

1. Follow the current UDOT Signalized Intersection Design Manual and PSDS to complete the plan sheets.

Callout items necessary for construction.

Include proposed signs.

Include pole schedule, signal signs, signal head types and placement.
Include all callouts, labels, and notes necessary to construct the signal design.

D. Complete Signal Circuit Design and Plan Sheets

1. Follow the current UDOT Signalized Intersection Design Manual to complete the signal circuit designs and plan sheets.

Develop circuit designs necessary for construction of the project.

Detection Plans

Circuit Diagrams

Signal Circuits

Push Button Circuits

Lighting Circuits

Prepare circuit design plan sheets.

General Plan Sheet Requirements

Detail Sheet Requirements

Identify conduits, cables, schedules, etc.

Identify locations, alignments, etc.

Include all necessary notes, callouts, dimensions, and symbols

Use identifiable symbols and line styles

E. Complete Signal Schedule Sheets

1. Use UDOT Excel spreadsheets and customize for the project.
2. Use the Signal and Lighting Design File to develop the Signal Schedule Sheets.

General Plan Sheet Requirements

Signal Schedule Sheet Requirements

3. Include all bid items, units, and quantities.
4. Include names, alignment designations, stations, and offsets.
5. Export all schedules from Excel to MicroStation.

II. LIGHTING PLAN SHEETS OR DIGITAL MODEL FILES

A. Finalize Lighting Layout Design

1. Finalize the lighting layout design based on review comments and coordination with team members.
2. Coordinate with the signal design.

Refer to 3R3 as needed.

B. Complete Lighting Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website to finalize the lighting plan sheets.
2. Prepare the sheets or digital model file following guidance from UDOT RDM, QC/QA Checklist, UDOT PSDS and UDOT Digital Delivery Website in the format requested by reviewers and a format appropriate for the PS&E Review Meeting.
3. Provide the review sheets or digital model file to the Design Leader for distribution to all reviewers.

C. Complete Lighting Detail Sheets

1. Conform to UDOT Standards to complete the lighting details and plan sheets.
Develop details necessary for construction of the project.

D. Complete Lighting Schedule Sheets

III. SIGNAL & LIGHTING COST ESTIMATE

- A. Finalize Signing and/or Lighting Cost Estimate
 - 1. Update signal and lighting bid items and quantities.
 - 2. Complete the state furnished materials request form.
 - 3. Update signal and lighting unit prices.
- B. Enter Signal and/or Lighting Cost Estimate into Masterworks

IV. SIGNAL & LIGHTING PROJECT DOCUMENTS

- A. Develop Signal and/or Lighting Project Documents
 - 1. Provide all special provisions required for project construction.

V. QC DOCUMENTATION

- A. Perform QC Review
 - 1. Perform the QC Review following the UDOT QC/QA Procedures and the Roadway Design QC Checklist before distribution.

VI. SIGNAL AND/OR LIGHTING DESIGN APPROVAL

- A. Obtain Signal and/or Lighting Design Approval
 - 1. Submit signal and lighting design to the Region Traffic and Safety for approval.
 - 2. Make any revisions required and obtain final approval.

6R1 Design Support During Construction

Overview

Be available to answer questions with respect to the roadway design plans and/or specifications throughout the construction phase of the project.

References

AASHTO Roadway Lighting Design Guide
AASHTO, A Policy on Geometric Design of Highways and Streets
AASHTO Roadside Design Guide
UDOT Sign Manual
UDOT Project Design Certification (PDC)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Light Rail Transit Manual of Instruction (LRTMOI)
UDOT Plan Sheet Development Standards Manual (PSDS)
UDOT CADD Standards Manual
UDOT Digital Delivery Website
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings (DM Drawings)
UDOT Standard Specifications and Standard Drawings
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Signalized Intersection Design Manual
UDOT Roadway Lighting Design Guidelines
UDOT Drainage Manual of Instruction
Manual on Uniform Traffic Control Devices (MUTCD)
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. ADDENDUMS DURING ADVERTISEMENT

- A. Assist in Preparation and Review of Addendum(s)
 - 1. As necessary, assist the Project Manager in the preparation and review of addendums during advertisement.

II. RESPONSE TO RFI'S

- A. Respond to Design Questions
 - 1. Assist Project Manager and Resident Engineer with response to contractor design questions during advertisement period and/or during construction.
- B. Review and Update Plans and Specifications
 - 1. Based on responses to contractor design questions and/or RFI's, update plans and specifications accordingly.

III. UPDATED PLAN SHEETS, DIGITAL MODEL FILES, AND/OR SPECIFICATIONS FOR FIELD DESIGN CHANGES (FDC'S) AND NOTICES OF DESIGN CHANGE (NDC'S)

- A. Review FDC's and NDC's and Make Plan and/or Specification Updates
 - 1. Based on responses to FDC's and NDC's, update plans and specifications accordingly.

IV. COORDINATION MEETINGS

- A. Attend Pre-Bid Meeting

- B. Attend Pre-Construction Meeting
- C. Attend Partnering Meeting
- D. Attend the Post-Construction Meeting

STRUCTURES

1S1 Identify Preliminary Structure Type

Overview

Review the existing conditions and determine the physical requirements for structures work (bridge, culvert/headwall, rehabilitation, retaining walls, overhead sign/VMS structure). Develop a range of alternative structure types to fulfill the requirements.

References

AASHTO LRFD Bridge Design Specifications

Railroad Company Guidelines:

BNSF-UPRR Guidelines for Railroad Grade Separation Projects

UTA Light Rail Design Criteria

UTA Commuter Rail Design Criteria

UDOT ABC Decision Making Process Template

UDOT Structure Type Selection Report Template

UDOT Standard Drawings and Standard Specifications

UDOT Structures Design and Detailing Manual (SDDM)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. DRAFT STRUCTURE TYPE SELECTION REPORT

A. Includes the Following:

1. Objective of project including location of work
2. Existing structure conditions summary
3. Feasible alternatives
4. Construction phasing and limitations
5. Accelerated Bridge Construction (ABC) Decision Making Process document

B. Review Available Existing Structures Information

1. Request as-built drawings
2. Request for Structural Inventory & Appraisal Sheets (SI&A)
3. Request for Structures Scope and Estimate Report or Concept Reports
4. Request for Structures Plan for Every Structure (PFES)
5. Assure that as-built drawings accurately reflect the existing conditions (i.e. account for rehabilitations and/or widenings).

C. Meet with UDOT Structures Project Engineer

1. Perform a field inspection of the structure and document pertinent existing conditions.
2. Review and confirm the current structure conditions.
3. Review the recommended strategy and achieve concurrence on the work to be performed.

D. Evaluate Feasible Alternatives

1. Complete ABC Decision Making Process template.
2. Evaluate possible traffic impacts and assess possible ABC techniques
Incorporate user costs assessment
3. Determine if a structures design exception or deviation is required.
4. Identify items that may require additional study, creative design approaches, etc.
5. Determine the construction phasing and maintenance of traffic limitations.
6. Develop preliminary aesthetic concepts with the Aesthetics/Landscape group.

7. Review commitments from the Environmental Document (if applicable).
8. Review UPLAN or the applicable long range plan for the proposed location.
9. Evaluate right-of-way requirements and easements.
10. Coordinate with the involved disciplines for any special needs (relocations, etc.)

ITS conduits

Utility accommodations

Sign panel attachments

11. Develop an evaluation matrix for all alternatives.
12. Provide analysis / reasoning for eliminating or advancing alternatives.
13. Document decisions and rationale.
14. Establish the initial structural quantities, unit costs, and construction cost estimate.
15. Provide cost estimates for feasible alternatives.
16. For a new bridge and/or widening, do the following:
 - Identify hydraulic considerations (e.g., scour and channel migration).
 - Identify the number of spans.
 - Determine the preliminary span lengths.
 - Determine the preliminary girder type.
 - Take into account the project schedule and material availability.
 - Determine the preliminary structure depth.
 - Determine minimum horizontal and vertical clearances.
 - Determine the preliminary bent and abutment locations.
 - Determine the preliminary abutment types.
17. For new culvert/headwall and/or extensions, do the following:
 - Determine the preliminary box culvert type and size in close coordination with the hydraulics engineer.
 - Determine the preliminary headwall layout.
18. For rehabilitation, do the following:
 - Determine the preliminary work items.
 - Develop a rehabilitation strategy.
 - Determine scour countermeasure needs (if applicable).
19. For retaining walls, do the following:
 - Determine feasible wall types.
20. For overhead sign/VMS, do the following:
 - Determine the preliminary sign structure type.

E. Coordinate with Railroad Companies (if applicable)

1. Work with the Region Utility and Railroad Leader to coordinate project details with the railroad companies.
 - Early coordination with the railroad companies is critical.

II. DOCUMENTATION OF QUALITY PROCEDURES

A. Defined in Chapter 5 of the UDOT SDDM

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with a project document cover sheet, check print, and supporting documentation for the draft Structure Type Selection Report.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload required documentation of quality procedures into ProjectWise before the Scoping Meeting.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

3S1 Develop Structure Type Selection Report (TSR) & Seismic Design Strategy Report

Overview

Determine bridge layout and geometry for new bridge/widening design. Determine treatments for rehabilitations. Finalize the Structure Type Selection Report and develop the Seismic Design Strategy Report (Preliminary), as applicable.

A Structure Type Selection Report is only required for retaining walls when the complexity warrants evaluation of multiple types.

A Structure Type Selection Report is not required for headwalls or overhead sign/VMS structure.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT ABC Decision Making Process Template
UDOT Seismic Design Strategy Report Template
Structural Design Criteria Deviation Request Template
UDOT Structure Type Selection Report Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
Masterworks
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. STRUCTURE TYPE SELECTION REPORT (TSR)

A. Includes the Following:

1. Updated content of Draft TSR (1S1)
2. Recommended alternative
3. Structure design criteria
4. Preliminary plan, elevation, and cross section
5. Preliminary cost estimate

B. Develop Structure Design Criteria

1. See the UDOT SDDM for design requirements.

C. Develop Structure Cross-Section

1. See the UDOT SDDM for design requirements.

D. Develop Preliminary Layout and Finalize Type Selection Report

1. Refer to the Structure Type Selection Report Template for required content.
2. Coordinate with the Geotechnical Engineer.
3. Coordinate with the Hydraulic Engineer.
4. Update the draft Type Selection Report.
5. Include advantages and disadvantages of the bridge types evaluated.
6. Document decisions and rationale.
7. Recommend structure type.

8. Include advantages and disadvantages of the wall types evaluated and recommend a wall type, when a Type Selection Report is warranted for retaining walls.
 9. Do not prepare a Type Selection Report for headwalls.
 10. Do not prepare a Type Selection Report for overhead sign/VMS structure.
- E. Develop Structure Rehabilitation Strategies and Finalize Type Selection Report
1. Refer to the Structure Type Selection Report Template for required content.
 2. Update the draft Type Selection Report.
 3. Include advantages and disadvantages of rehabilitation strategies evaluated.
 4. Document decisions and rationale.
 5. Recommend rehabilitation strategy.
- F. Coordinate with Railroad Companies (if applicable)
1. Work with the Region Utility and Railroad Leader to coordinate project details with the railroad companies.

Early coordination with the railroad companies is critical, although this task occurs during S&L development, it is not tied to UDOT's specific timeline and must be coordinated with the Railroad Company.

Prepare the preliminary layout to show the existing track configuration and the spacing perpendicular to the tracks.

Discuss requirements with respect to the following items (other items may apply):

 - Vertical and horizontal clearances
 - Corrected track configurations and future tracks
 - Right-of-way
 - Structure type
 - Drainage
 - Crash walls
 - Fencing and understructure lighting
 - Construction phasing, shoring, soil stabilization, etc.
- G. Develop Preliminary Cost Estimate
1. Include preliminary costs for the proposed structure and/or the repairs to the existing structure as applicable.
 2. Compile initial structures bid items and quantities.

Verify bid items match UDOT standard bid items exactly as much as possible.
 3. Develop unit costs for each item.

Use appropriate resources for developing unit costs

Masterworks, local contractors, etc.

Document unit cost development, assumptions, etc.

Account for project specific factors:

 - Location
 - Time of year
 - Limitations of operation
 - Quantity of item
 - Current bidding environment
 - Availability of materials
 - Familiarity of process
 - Specialty equipment
 - Risk to contractor
 - Inflation

Construction Schedule

Constructability

4. Use lump sum pricing only when appropriate.
Consider contractor risk due to unknown quantity.
Consider the difficulty in pricing per unit.
Consider all materials and labor involved.

II. SEISMIC DESIGN STRATEGY REPORT (PRELIMINARY)

A. Develop Seismic Design Strategy Report (Preliminary)

1. Refer to the Structures Division Seismic Design Strategy Report Template for required content.
2. Describe the design strategy for resisting the design seismic event.
3. Include descriptions of expected damage, locations of plastic hinging, the redistribution of forces, the mobilization of backfills, and the functions of bearings, as appropriate.
4. Evaluate the need to retrofit existing structure (if applicable).

III. DOCUMENTATION OF QUALITY PROCEDURES

A. Defined in Chapter 5 of the UDOT SDDM

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

3S2 Develop Situation & Layout (S&L) For Culverts

Overview

Develop the Situation and Layout (S&L) plan sheets for culverts (box culverts, headwalls, etc.), fully coordinating with the roadway geometric and hydraulic requirements. S&L plan sheets for headwalls are only required when the working standards are modified in any way or when a custom design is required.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. S&L PLAN SHEETS

A. Obtain Draft Bridge Hydraulics Report (if applicable)

1. Obtain draft bridge hydraulics report from the Hydraulics Engineer.
2. Coordinate with the Hydraulics Engineer regarding any changes to the structure which may affect the bridge hydraulics report during structural development.

B. Request Structure Number

1. Submit a structure number request for a box culvert or structure number request for headwalls and other structures through the Structures Division on the UDOT website.

C. Coordinate with Railroad Companies (if applicable)

1. Work with the Region Utility and Railroad Leader to coordinate project details with the railroad companies.

Early coordination with the railroad companies is critical, although this task occurs during S&L development, it is not tied to UDOT's specific timeline and must be coordinated with the Railroad Company.

Prepare the preliminary layout to show the existing track configuration and the spacing perpendicular to the tracks.

Discuss requirements with respect to the following items (other items may apply):

- Vertical and horizontal clearances
- Corrected track configurations and future tracks
- Right-of-way
- Structure type
- Drainage
- Fencing
- Construction phasing, shoring, soil stabilization, etc.

D. Develop S&L Plan Sheets

1. Develop S&L plan sheets.

2. Coordinate with the Roadway Engineer, Geotechnical Engineer, and Hydraulic Engineer.
 3. Consider the need for scour protection, rip rap, etc.
 4. Submit preliminary S&L plan sheets to Geotechnical Engineer. (if applicable)
- E. Provide Constructability Review
1. Verify that the structure can be reasonably constructed and determine a plausible construction sequence.

II. S&L SHEETS GUIDELINES & CHECKLIST FOR A CULVERT

- A. Complete S&L Sheet Guidelines and Checklist for a Culvert
1. See the S&L Sheet Guidelines and Checklist for a Culvert for instructions on completing.

III. DOCUMENTATION OF QUALITY PROCEDURES

- A. Defined in Chapter 5 of the UDOT SDDM
1. QC cover sheets for all deliverables
 2. Form: AUD-QA: Project QA Audit
 3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
 4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)
- B. Perform Required Quality Procedures
1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.
 - Provide the Checker with the applicable cover sheets, a check print of each deliverable, and supporting documentation.
 - Follow the UDOT Structures QC/QA Procedures for checking and auditing.
 - Upload all required documentation of quality procedures to ProjectWise before distribution of the milestone review package.
 - Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.
- C. Prepare Structural Design Criteria Deviation Request (if applicable)
1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
 2. Submit for review and approval before beginning design.

3S3 Develop Situation & Layout (S&L) For Rehabilitation

Overview

Develop the Situation and Layout (S&L) plan sheets with the expected structural rehabilitation work items for the structure. This activity is not required for bridge preservation work items.

Refer to the UDOT Structures Design and Detailing Manual (SDDM) for a description of rehabilitation and preservation work items.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT Railroad Notes and Clearances (WS-01)
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. S&L PLAN SHEETS

A. Request Structure Drawing Number

1. Submit a structure drawing number request for rehabilitation through the Structures Division on the UDOT website.

B. Develop Repair Lists

1. Create a list of required or desired structural repairs.

C. Develop S&L Plan Sheets

1. Develop S&L plan sheets.
2. Generate a plan set with a general sketch of the structure to show anticipated rehabilitation work to facilitate general discussion and reviews.
Include the relevant existing plan sheets for information only.

D. Provide Constructability Review

1. Verify that the structure can be reasonably constructed and determine a plausible construction sequence.

E. Review Work Items

1. Coordinate anticipated work items with project team.

F. Submit S&L Plan Sheets to Region Utility and Railroad Leader (if applicable)

1. Coordinate with the Region Utility and Railroad Leader.
2. Submit the S&L plan sheets showing the required railroad information.
3. Include the project specific Railroad Notes and Clearances sheet in the submittal.
4. Submit additional information required by the railroad companies.
Refer to the respective railroad company's guidelines for additional submittal content.
5. Inform the railroad companies that they will have an opportunity for a final review of the S&L with the 100% submittal when the design is complete.

It is important that the railroad companies are kept informed in the earlier stages to avoid impacts to the project schedule.

II. S&L SHEET GUIDELINES & CHECKLIST FOR A REHABILITATION

A. Complete S&L Sheet Guidelines and Checklist for a Rehabilitation

1. See the S&L Sheet Guidelines and Checklist for Rehabilitation for instructions on completing.

III. DOCUMENTATION OF QUALITY PROCEDURES

A. Defined in Chapter 5 of the UDOT SDDM

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable, and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

3S4 Develop Situation & Layout (S&L) For Retaining Walls

Overview

Develop the Situation and Layout (S&L) plan sheets for each wall, fully coordinating with the roadway, grading, and geotechnical requirements.

Refer to the UDOT Structures Design and Detailing Manual (SDDM) for plan content and organization.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. S&L PLAN SHEETS

A. Request Structure Number

1. Submit a structure number request for retaining walls through the Structures Division on the UDOT website.

B. Develop S&L Plan Sheets

1. Develop S&L plan sheets.

Refer to UDOT SDDM

2. Coordinate with the Roadway Engineer and the Geotechnical Engineer.
3. Obtain retaining wall alignment and elevation view from Roadway Engineer for sheet development.
4. Consider the type of wall to be used, the treatment at the top of the wall required (e.g., moment slab, coping, or fence), and its proximity and interaction to adjacent structures and waterways.

C. Provide Constructability Review

1. Verify that the structure can be reasonably constructed and determine a plausible construction sequence.

D. Submit S&L Plan Sheets to Region Utility and Railroad Leader (if applicable)

1. Coordinate with the Region Utility and Railroad Leader.
2. Submit the S&L plan sheets showing the required railroad information.
3. Submit additional information required by the railroad companies.

Refer to the respective railroad company's guidelines for additional submittal content.

II. S&L SHEET GUIDELINES & CHECKLIST FOR A RETAINING WALL

A. Complete S&L Sheet Guidelines and Checklist for a Retaining Wall

1. See the S&L Sheet Guidelines and Checklist for a Retaining Wall for instructions on completing.

III. DOCUMENTATION OF QUALITY PROCEDURES

A. Defined in Chapter 5 of the UDOT SDDM

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to the UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

3S5 Develop Situation & Layout (S&L) for Bridge

Overview

Develop the Situation and Layout (S&L) plan sheets to ensure the compatibility between the structures and roadway design.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT Railroad Notes and Clearances (WS-01)
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. S&L PLAN SHEETS

- A. Obtain Draft Bridge Hydraulics Report (if applicable)
 - 1. Obtain draft bridge hydraulics report from the Hydraulics Engineer.
 - 2. Coordinate with the Hydraulics Engineer regarding any changes to the structure which may affect the bridge hydraulics report during structural development.
- B. Request Structure Number
 - 1. Submit a structure number request for a new bridge or a structure drawing number request for a bridge widening through the UDOT Structures Design and Bridge Management website.
- C. Develop S&L Plan Sheets
 - 1. Develop S&L plan sheets.
 - 2. Submit S&L plan sheets and preliminary structure foundation loads to the Geotechnical Engineer.
 - 3. Consider the need for scour protection, rip rap, etc.
- D. Provide Constructability Review
 - 1. Verify that the structure can be reasonably constructed and determine a plausible construction sequence.
- E. Submit S&L Plan Sheets to Region Utility and Railroad Leader (if applicable)
 - 1. Coordinate with the Region Utility and Railroad Leader.
 - 2. Submit the Situation and Layout (S&L) plan sheets showing the required railroad information.
 - 3. Include the project specific Railroad Notes and Clearances sheet in the submittal.
 - 4. Submit additional information required by the railroad companies.
 - Refer to the respective railroad company's guidelines for additional submittal content.

II. S&L SHEET GUIDELINES & CHECKLIST FOR A NEW BRIDGE OR WIDENING

- A. Complete S&L Sheet Guidelines and Checklist for a New Bridge or Widening

1. See the S&L Sheet Guidelines and Checklist for a New Bridge or Widening for instructions.

III. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to the UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

3S6 Situation & Layout (S&L) Authorization

Overview

Obtain authorization from the Structures Division for Situation and Layout (S&L) plan sheets and the Type Selection Report to continue work.

References

Form: PIH-REV: Structural Review Completion - Plan in Hand (Stage 3) Review

Form: S&L Authorization (3S6)(S&L ATH)

UDOT Structural Documentation Email Template

UDOT Structure Type Selection Report Template

UDOT Seismic Design Strategy Report Template

UDOT Structures Design and Detailing Manual (SDDM)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. STRUCTURAL DOCUMENTATION PACKAGE

A. Address Structural Review Comments

1. See the UDOT Structures QC/QA Procedures for addressing and managing structural review and milestone review comments.
2. Review and address comments on the Structural Review Comment Resolution Form.
3. Review and address comments related to structures on the Geometry Review and Plan in Hand Review comment resolution forms.

Respond to each comment.

Make revisions to the design and the deliverables according to the responses that impact the S&L plan sheets and TSR and that must be addressed before beginning the PS&E stage.

Conduct QC Review and Verification of all comments according to the UDOT Structures QC/QA Procedures.

B. Submit Structural Documentation Package

1. Prepare a package for S&L Authorization and submit the ProjectWise links to the Structure Project Engineer (and copy the Structures Design Manager) for review.

Refer to the UDOT Structural Documentation Email Template for required format of the submittal.

Include the following for each structure, as appropriate:

Structure Type Selection Report (TSR)

Structure design criteria

Preliminary cost estimate

Seismic Design Strategy Report (Preliminary)

S&L Plan Sheet(s)

S&L Sheet Guidelines and Checklist (for each structure type)

II. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Authorized Form: ALT-ATH: Alternate QC/QA Procedures Authorization
4. Approved Form: DEV-APP: Structural Design Criteria Deviation Approval

5. Form: STR-CRF: Structural Review Comment Resolution Form (with responses and disposition, as applicable)
6. Form F1: Milestone Review Comment Resolution Form (with responses and disposition, as applicable)
7. Form: PIH-REV: Structural Review Completion - Plan in Hand (Stage 3) Review (completed and signed)
8. Form: S&L Authorization (3S6)(S&L ATH)

III. FORM: S&L-ATH: S&L AUTHORIZATION (3S6)
(SIGNED BY UDOT STRUCTURES DESIGN MANAGER)

- A. Review Structural Documentation Package - UDOT Structures Division Responsibility
 1. Verify that comment responses have been addressed that must be incorporated into the deliverables and that impact the beginning of the PS&E stage.
 2. Verify that all documentation is complete.
- B. Authorize S&L - UDOT Structures Division Responsibility
 1. Sign the TSR
 2. Sign Form: S&L Authorization (3S6)(S&L ATH)

4SA Design & Detail Bridge

Overview

Design and detail new and widened bridges according to the approved Structures Division for Situation and Layout (S&L) and structural design criteria. Check deliverables according to the approved S&Ls and structural design criteria following the UDOT Structures UDOT Structures QC/QA Procedures. Incorporate design requirements and the preliminary information from the draft geotechnical report and/or the hydraulic report.

Receive S&L authorization (3S6) before beginning design.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
AASHTO Manual for Bridge Evaluation
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT Bridge Management Manual (BMM)
UDOT Seismic Design Strategy Report Template
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. SUPERSTRUCTURE DESIGN CALCULATIONS

- A. Design Deck, Overhang, Approach Slabs, and Parapets
 - 1. See the UDOT SDDM for design requirements.
- B. Design Beam(s)
 - 1. See the UDOT SDDM for design requirements.
- C. Design Bearing Pad(s)
 - 1. See the UDOT SDDM for design requirements.
- D. Determine Screed Elevations
 - 1. See the UDOT SDDM for design requirements.

II. SUPERSTRUCTURE PLANS

- A. Develop Superstructure Plans
 - 1. See the UDOT SDDM for design requirements.

III. SUBSTRUCTURE DESIGN CALCULATIONS

- A. Determine Bridge Seat Elevations
 - 1. See the UDOT SDDM for design requirements.
- B. Design Abutment(s) and Wingwall(s)
 - 1. See the UDOT SDDM for design requirements.
- C. Design Bent(s)
 - 1. See the UDOT SDDM for design requirements.
- D. Design Foundation(s)
 - 1. Obtain final geotechnical report from Geotechnical Engineer.

2. Design the foundations based on static loading, the seismic analysis, and the geotechnical report.

E. Perform Seismic Analysis

IV. SUBSTRUCTURE PLANS

A. Develop Substructure Plans

1. See the UDOT SDDM for design requirements.

V. S&L SHEET CHECKLIST

A. Complete S&L Sheet Checklist

1. See the S&L Sheet Guidelines and Checklist for a New Bridge or S&L Sheet Guidelines and Checklist for a Bridge Widening for instructions.

VI. SEISMIC DESIGN STRATEGY REPORT (FINAL)

A. Prepare Seismic Design Strategy Report (Final)

1. Finalize the design strategy for resisting the design seismic event.
2. Include descriptions of expected damage, locations of plastic hinging, the redistribution of forces, the mobilization of backfills, and the functions of bearings, as appropriate.

VII. LOAD RATING PACKAGE

A. Perform Load Ratings

1. Provide design load ratings using methods described in the AASHTO Manual for Bridge Evaluation and in conformance with Chapter 4 of the UDOT BMM.
2. Provide both inventory and operating ratings.
3. Prepare and submit the Load Rating Package according to Chapter 4 of the UDOT BMM.

VIII. RAILROAD COMPANY SUBMITTAL PACKAGE (IF APPLICABLE)

A. Submit Documents for Railroad Company Review

1. Coordinate with the Region Utility and Railroad Leader.
2. Prepare and submit to the Region Utility and Railroad Leader the 60% Railroad Company Submittal Package for structures supporting the Railroad.
Refer to the respective railroad company's guidelines for submittal content.

Content may include the following items:

60% design plans.

60% design calculations.

Special provisions.

Geotechnical report.

Additional information required by the railroad companies.

IX. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.

2. Submit for review and approval before beginning design of affected element(s).

4SM Design & Detail Culverts

Overview

Design, detail, and check culvert structures (box culverts, headwalls, etc.).

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design

AASHTO LRFD Bridge Design Specifications

AASHTO Manual for Bridge Evaluation

UDOT Bridge Management Manual (BMM)

Structural Design Criteria Deviation Request Template

UDOT Standard Drawings and Standard Specifications

UDOT Structures Design and Detailing Manual (SDDM)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. CULVERT DESIGN CALCULATIONS

A. Coordinate Design with Hydraulics and Geotechnical Engineers

1. If sufficient information is available at this stage, advance the drainage structures. Otherwise, wait until 4Q1 and/or 4G1 are further progressed.

Coordinate the geometry and sizing of the box culverts, headwalls, and other drainage structures with hydraulic requirements.

Coordinate with the roadway design engineers to size the headwalls and wingwalls to accommodate grading requirements.

Develop design based on the geotechnical report.

B. Design Box Culvert

1. See the UDOT SDDM for design requirements.

C. Design Headwall

1. See the UDOT SDDM for design requirements.

D. Design Wingwalls, Aprons, and Cutoff Walls

1. See the UDOT SDDM for design requirements.

II. CULVERT PLANS

A. Develop Culvert Plans

1. Develop drainage structure plans, including the layout of the wingwalls, aprons, and cutoff walls.
2. Develop miscellaneous structure plans (headwalls, drainage boxes, etc.).
3. Conform to UDOT SDDM for developing and completing structure plan sheets.

III. RAILROAD COMPANY SUBMITTAL PACKAGE (IF APPLICABLE)

A. Submit Documents for Railroad Company Review

1. Coordinate with the Region Utility and Railroad Leader.
2. Prepare and submit to the Region Utility and Railroad Leader the 60% Railroad Company Submittal Package for structures supporting the Railroad.

Refer to the respective railroad company's guidelines for submittal content.

Content may include the following items:

60% design plans.

60% design calculations.

Special provisions.

Geotechnical report.
Additional information required by the railroad companies.

IV. S&L SHEET GUIDELINES AND CHECKLIST FOR A CULVERT

A. Complete S&L Sheet Guidelines and Checklist for a Culvert

1. Update the S&L checklist from Plan-in-Hand (Stage 3).

See the S&L Sheet Guidelines and Checklist for a Culvert for instructions.

V. LOAD RATING PACKAGE

A. Perform Load Ratings

1. Perform a load rating only when a culvert is classified as a bridge according to the UDOT BMM.
2. Provide design load ratings using methods described in the AASHTO Manual for Bridge Evaluation and in conformance with Chapter 4 of the UDOT BMM.
3. Provide both inventory and operating ratings.
4. Prepare and Submit the Load Rating Package according to Chapter 4 of the UDOT BMM.

VI. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

4S1 Design & Detail Rehabilitation

Overview

Design and detail the rehabilitation and preservation procedures and repairs. Check deliverables according to design.

Refer to the UDOT Structures Design and Detailing Manual (SDDM) for a description of rehabilitation and preservation work items.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Design Specifications
AASHTO Manual for Bridge Evaluation
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT Bridge Management Manual (BMM)
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. STRUCTURE REHABILITATION AND/OR PRESERVATION DESIGN CALCULATIONS

A. Design Procedures and Repairs

1. See the UDOT SDDM for design requirements.
2. Develop design calculations to support the details as required for unique elements or details.

II. STRUCTURE REHABILITATION AND/OR PRESERVATION PLANS

A. Request Structure Drawing Number (if applicable)

1. Submit a structure drawing number request for preservation work items through the Structures Division on the UDOT website.

This is only required if there are no rehabilitation work items and a structure drawing number was not previously requested (3S3).

Refer to the UDOT SDDM for guidance on structure drawing numbers for rehabilitation and preservation projects.

B. Develop Plans

1. Conform to UDOT SDDM for developing and completing structure plan sheets.

III. RAILROAD COMPANY SUBMITTAL PACKAGE (IF APPLICABLE)

A. Submit Documents for Railroad Company Review

1. Coordinate with the Region Utility and Railroad Leader.
2. Prepare and submit to the Region Utility and Railroad Leader the 60% Railroad Company Submittal Package for structures supporting the Railroad.

Refer to the respective railroad company's guidelines for submittal content.

Content may include the following items:

60% design plans.

60% design calculations.
Special provisions.
Geotechnical report.
Additional information required by the railroad companies.

IV. S&L SHEET GUIDELINES AND CHECKLIST FOR A REHABILITATION

A. Complete S&L Sheet Guidelines and Checklist for a Rehabilitation

1. Update the S&L checklist from Plan-in-Hand (Stage 3).

See the S&L Sheet Guidelines and Checklist for Rehabilitation for instructions.

V. LOAD RATING PACKAGE

A. Perform Load Ratings

1. Perform a load rating only when the design involves a substantial structural alteration according to the UDOT BMM.
2. Provide design load ratings using methods described in the AASHTO Manual for Bridge Evaluation and in conformance with Chapter 4 of the UDOT BMM.
3. Provide both inventory and operating ratings.
4. Prepare and submit the Load Rating Package according to Chapter 4 of the UDOT BMM.

VI. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

4S2 Design & Detail Overhead Sign/VMS Structure

Overview

Design, detail, and check the sign structure supports based on the approved sign panel size and layout.

References

LRFD Specification for Structural Supports for:
Highway Signs, Luminaries, and Traffic Signs (1st Edition)
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. SIGN STRUCTURE DESIGN CALCULATIONS

A. Request Structure Number

1. Submit a structure number request for sign structures through the Structures Division on the UDOT website.

B. Review Sign Structure Layout

1. Review the sign panel and sign structure layouts and verify that their placement allows for an efficient sign structure design.
2. Coordinate with the ITS and electrical layouts to determine where conduit will be required.

C. Design Sign Structure

1. Determine if the standard sign structure design detailed in the UDOT SDDM will apply.

If the standard design does apply, use the panel arrangements and structure support locations to determine the appropriate structural element sizing.

If the standard design does not apply, use the requirements in the UDOT SDDM, as well as project requirements, to determine the correct sizing for the following elements, among others:

Mast, elbow, and post tube sizes and thicknesses
Drilled shaft diameters and depths
Field and base plate requirements
Sign panel and variable message sign (VMS) support requirements
Handhole and chase nipple locations

II. SIGN STRUCTURE PLANS

A. Develop Sign Structure Plans

1. Use the Structures Division's working standard drawings for sign structures (standard or non-standard) along with the design to develop sign structure plans.
2. Conform to UDOT SDDM for developing and completing structure plan sheets.

III. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit

3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
 4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)
- B. Perform Required Quality Procedures
1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.
 - Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.
 - Follow the UDOT Structures QC/QA Procedures for checking and auditing.
 - Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.
 - Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.
- C. Prepare Structural Design Criteria Deviation Request (if applicable)
1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
 2. Submit for review and approval before beginning design.

4S3 Design & Detail Retaining Walls

Overview

Design, detail, and check the retaining walls based on the approved S&Ls and the structural design criteria. Incorporate design requirements and the preliminary information from the draft geotechnical report and/or the hydraulic report.

References

AASHTO LRFD Bridge Design Specifications
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
Structural Design Criteria Deviation Request Template
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. WALL DESIGN CALCULATIONS

- A. Coordinate with Roadway and Geotechnical Engineers
 - 1. Coordinate details with the roadway and geotechnical engineers.
- B. Design Wall
 - 1. See the UDOT SDDM for design requirements.

II. WALL PLANS

- A. Develop Wall Plans
 - 1. Based on approved S&L, roadway profiles, and the geotechnical report, progress development of the wall plans.
 - 2. Consider the treatments required at the top of the wall, including moment slabs, fences, and coping as well as tying the wall into an adjacent structure.
 - 3. Conform to the UDOT SDDM for developing and completing structure plan sheets.

III. S&L SHEET GUIDELINES AND CHECKLIST FOR A RETAINING WALL

- A. Complete S&L Sheet Guidelines and Checklist for a Retaining Wall
 - 1. Update the S&L checklist from Plan-in-Hand (Stage 3).
 - See the S&L Sheet Guidelines and Checklist for a Retaining Wall for instructions.

IV. SUBMIT DOCUMENTS FOR RAILROAD COMPANY REVIEW

- A. Submit Documents for Railroad Company Review
 - 1. Coordinate with the Region Utility and Railroad Leader.
 - 2. Prepare and submit to the Region Utility and Railroad Leader the 60% Railroad Company Submittal Package for structures supporting the Railroad.
 - Refer to the respective railroad company's guidelines for submittal content.
 - Content may include the following items:
 - 60% design plans.
 - 60% design calculations.

Special provisions.
Geotechnical report.
Additional information required by the railroad companies.

V. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)
4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

C. Prepare Structural Design Criteria Deviation Request (if applicable)

1. Refer to the Structures Division Structural Design Criteria Deviation Request Template for required content.
2. Submit for review and approval before beginning design.

4S4 Complete Structure Project Documents

Overview

Finalize the special provisions, measurement and payment, and estimate.

References

Structural Design Criteria Deviation Approval (DEV APP)
International Building Code (Transit stations and buildings/facilities)
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT Bridge Management Manual (BMM)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Specification Writer's Guide
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
Masterworks
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. ENGINEER'S ESTIMATE

- A. Finalize Structures Engineer's Estimate
 - 1. Update bid items, quantities, and unit prices. (see 3S1)
- B. Enter Cost Estimate into Masterworks
 - 1. Match Engineer's Estimate bid items and plan sheet bid items exactly.

II. STRUCTURE PROJECT DOCUMENTS

- A. Coordinate Specifications with Plan Sheets
 - 1. Verify specifications accurately reflect design intent and details on plan sheets.
- B. Develop Special Provisions
 - 1. Provide special provisions required for project construction not covered in the standard specifications.
 - Division Special Provisions
 - Project Specific Special Provisions
- C. Develop Measurement and Payment (M&P)
 - 1. Use Masterworks to generate M&P for all standard bid items.
 - Develop M&P for all non-standard bid items.
 - Use the current M&P .
 - Modify standard descriptions to match project requirements, if applicable.
 - Include accurate description for all effort and materials required for construction.
- D. Complete Deviation From UDOT Standards Form
 - 1. Input structure items into the project Structural Design Criteria Deviation Approval (DEV APP).

III. RAILROAD COMPANY SUBMITTAL PACKAGE (IF APPLICABLE)

- A. Submit Documents for Railroad Company Review
 - 1. Coordinate with the Region Utility and Railroad Leader.

2. Prepare and submit to the Region Utility and Railroad Leader the Railroad Company Submittal Package.

Refer to the respective railroad company's guidelines for submittal content.

Content may include the following items:

100% design plans.

100% design calculations for underpass structures only.

Special provisions.

Geotechnical report.

Additional information required by the railroad companies.

IV. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables

2. Form: AUD-QA: Project QA Audit

3. Form: ALT-ATH: Alternate QC/QA Procedures Authorization (if applicable)

4. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the milestone review package.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

5S1 Deliver Final Structure Acceptance

Overview

Assemble and submit final structural documentation for each structure in order to obtain the final acceptance to release the structural plans and documentation for advertising. Finalized structural documentation includes incorporation of all structures related comments made throughout the project.

References

Form: PSE-ACC: Final Structure Acceptance (5S1)

Form: PSE-REV: Structural Review Completion - PS&E (Stage 4) Review

UDOT Structural Documentation Email Template

UDOT Seismic Design Strategy Report Template

UDOT Structures Design and Detailing Manual (SDDM)

UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. STRUCTURAL DOCUMENTATION PACKAGE

A. Submit Final Structural Documentation Package

1. Prepare a package and submit the ProjectWise links to the Structure Project Engineer (and copy the Structures Design Manager) for final review.

Refer to the UDOT Structural Documentation Email Template for required format of the submittal.

Include the following for each structure, as appropriate:

Structure Plans (signed and sealed) - include .pdf and .dgn files necessary to create the entire plan set.

Special Provisions

Engineer's Estimate

Measurement & Payment

Design Calculations

Load Rating Package

Seismic Design Strategy Report (Final)

Final Geotechnical Report

Final Hydraulic Report

S&L Sheet Guidelines and Checklist (for each structure) - updated from 3S6

II. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Approved Form: DEV-APP: Structural Design Criteria Deviation Approval (may be more than one)
4. Form: STR-CRF: Structural Review Comment Resolution Form-with responses and dispositions
5. Form F1: Milestone Review Comment Resolution Form (with responses and dispositions.)
6. Form: PSE-REV: Structural Review Completion Form
PS&E (Stage 4) Review (completed and signed)

III. FORM: PSE-ACC: FINAL STRUCTURE ACCEPTANCE (5S1) - SIGNED BY UDOT STRUCTURES DESIGN MANAGER

- A. Review Structural Documentation Package - UDOT Structures Division Responsibility
 - 1. Verify that structural comment responses and verification are complete.
 - 2. Verify that all documentation is complete and that the structure design documents are ready to advertise.
- B. Accept Structure - UDOT Structures Division Responsibility
 - 1. Sign Seismic Design Strategy Report (Final).
 - 2. Sign Form: PSE-ACC: Final Structure Acceptance (5S1).
 - 3. Sign plan sheets, if applicable.
 - UDOT Structures Division does not sign plan sheets for Local Government or Design Build projects.

IV. INVENTORY DOCUMENTATION PACKAGE

- A. Submit Final Structure Inventory Documentation Package to Bridge Management
 - 1. Resubmit the final Structural Documentation Email Template to bridgemanagement-5s1@utah.gov after Final Structure Acceptance (5S1) and Plans have been signed by the Structures Design Manager.

6S1 Structure Construction Services

Overview

Review construction submittals. Perform design services during construction. Prepare construction revisions on contract plan sheets based on structural design changes and plan revisions. Perform construction submittal reviews.

References

AASHTO Guide Specifications for LRFD Seismic Bridge Design
AASHTO LRFD Bridge Construction Specifications
AASHTO LRFD Bridge Design Specifications
AASHTO Manual for Bridge Evaluation
LRFD Specification for Structural Supports for:
Highway Signs, Luminaries, and Traffic Signs (1st Edition)
International Building Code (Transit stations and buildings/facilities)
Railroad Company Guidelines
BNSF-UPRR Guidelines for Railroad Grade Separation Projects
UTA Light Rail Design Criteria
UTA Commuter Rail Design Criteria
UDOT Bridge Management Manual (BMM)
UDOT Bus Rapid Transit Manual of Instruction (BRTMOI)
UDOT Standard Drawings and Standard Specifications
UDOT Structures Design and Detailing Manual (SDDM)
UDOT Structures QC/QA Procedures

Deliverables & Tasks

I. WORKING DRAWING REVIEWS AND/OR APPROVALS

A. Review and/or Approve Working Drawings

1. Review working drawings (construction submittals) as required.
2. Refer to the UDOT SDDM for working drawing/construction review procedures.

II. CONSTRUCTION RESPONSES

A. Perform Design Services

1. Perform design services during construction.

III. CONSTRUCTION REVISIONS TO CONTRACT PLAN SHEETS

A. Revise Calculations and Plans

1. Revise design calculations and plans to address changes.
2. Refer to the UDOT SDDM for revision procedures.

B. Revise Load Ratings

1. Revise load rating package to address changes when required by the UDOT BMM.

Update design load ratings using methods described in the AASHTO Manual for Bridge Evaluation and in conformance with Chapter 4 of the UDOT BMM.

Provide both inventory and operating ratings.

Prepare and Submit the Load Rating Package according to Chapter 4 of the UDOT BMM.

C. Submit Construction Revisions to Contract Plan Sheets

1. Prepare revised sheets according to the UDOT SDDM for procedures for plan revisions.

IV. FINAL STRUCTURE INSPECTION

A. Participate in Final Structure Inspection

1. Coordinate with Resident Engineer, Bridge Management Engineer, and Structures Design Manager for final bridge inspection and acceptance.

V. AS-BUILT PLANS

A. Create and Submit As-built Plans

1. Prepare as-built plans according to the UDOT SDDM based on construction.
2. Submit as-built plans to the UDOT Structures Division before project close-out.
3. Submit as-built plans to the railroad companies.
4. Coordinate with the Region Utility and Railroad Leader.
5. Refer to the railroad company's guidelines for submittal content.

VI. DOCUMENTATION OF QUALITY PROCEDURES

A. Include the following, defined in Chapter 5 of the UDOT SDDM:

1. QC cover sheets for all deliverables
2. Form: AUD-QA: Project QA Audit
3. Form: DEV-APP: Structural Design Criteria Deviation Approval (if applicable)

B. Perform Required Quality Procedures

1. Initiate and complete the required quality procedures following the UDOT Structures QC/QA Procedures and the UDOT SDDM before distribution.

Provide the Checker with the applicable cover sheets, a check print of each deliverable and supporting documentation.

Follow the UDOT Structures QC/QA Procedures for checking and auditing.

Upload all required documentation of quality procedures into ProjectWise before distribution of the deliverables.

Refer to UDOT SDDM, Chapter 5 for quality procedures and documentation that is required to be uploaded to ProjectWise.

TRAFFIC & SAFETY

1T1 Assess Traffic Operations & Safety Needs

Overview

Identify existing conditions and traffic related issues including excessive queuing or safety concerns such as crashes. Determine the existing traffic demand volumes and forecast future volumes or, if available, review data from environmental documents or other studies. Develop or review potential alternatives to accommodate existing, interim, and future traffic volumes. Obtain the current safety needs and develop a strategy to address the project area's safety issues.

Determine the potential reviewers for the size of the project. For projects that involve an innovative intersection, either existing or proposed, or a regionally significant corridor, reach out to the UDOT Statewide Operations Engineer. For projects that involve an interchange or any section of a freeway, identify & reach out to both the appropriate FHWA Area Engineer and the current UDOT Statewide Traffic Engineer. For all other projects, refer to the Region Traffic Operations Engineer.

References

Highway Capacity Manual
MUTCD (Manual on Uniform Traffic Control Devices)
Federal Highway Administration Traffic Analysis Toolbox
Federal Highway Administration IACR Guidance Document
UDOT Traffic Analysis Guidelines
UDOT Operations (06) Policies
Previous Project Safety Analysis (PSA) and/or Operations Analysis if available
MPOs Travel Demand Model (TDM)
UDOT Freeway PeMS (radar traffic point data for speeds, volumes & vehicle classification)
UDOT Clearguide (traffic probe data for travel times & speeds)
UDOT Automated Traffic Signal Performance Metrics (ATSPM)
UDOT Policy 06C-42
UDOT QC/QA Documentation

Deliverables & Tasks

I. UPDATED PROJECT SAFETY ANALYSIS (PSA)

A. Review/Update Project Safety Analysis

1. Obtain the PSA from the Concept Report.

If the PSA is greater than 2 years old, or if there was not a PSA performed with the concept report, request a PSA.

2. Review recommendations and consider as a project team whether implementing them is feasible for the project.

B. Review Crash Data

1. Obtain the current crash data.

2. Review the types of crashes.

3. Identify the hot spot locations

C. Identify Safety Concerns

1. Coordinate with local agencies on possible safety concerns

2. Identify Safety Mitigation/Remedies

3. Prioritized List of Safety Improvements

II. SIGHT DISTANCE REVIEW

A. Obtain updated Sight Distance Analysis & Review

1. Request LIDAR Sight Distance/Flat Spot Analysis from UDOT Central Traffic and Safety.
2. Review results for passing sight distance, stopping sight distance, intersection sight distance and flat spots as appropriate for the project.

III. PRELIMINARY EXISTING OPERATIONS ANALYSIS

A. Determine Traffic Analysis Study Area

1. Determine appropriate traffic analysis study area and model limits based on the criteria provided in the UDOT Traffic Analysis Guidelines.
2. Coordinate with the Region Traffic Operations Engineer and, for large projects, the Traffic Performance Engineer.

B. Obtain Traffic Counts

1. Review any existing data including Freeway PeMS, Clearguide, and ATSPM.
2. Use the existing data available to determine the appropriate time periods for data collection, confirm these with the Region Traffic Operations Engineer and/or UDOT Statewide Operations Engineer.
3. Collect the appropriate periods of traffic counts including vehicle classification.
4. Collect peak-hour pedestrian movement counts.
5. Perform the appropriate origin/destination study if needed.

C. Request Pertinent Traffic Studies (as necessary)

1. Request the signal warrant study through the Region Traffic Engineer if applicable.

D. Review Existing Travel Demand Model (TDM)

1. Determine the accuracy and suitability of the travel model within the study area in accordance with the UDOT Traffic Analysis Guidelines.
2. TDM use and development should be done in coordination with the MPO, the Planning Manager for TDM and, for large projects, the UDOT Statewide Operations Engineer.

Determine whether there is updated socio-economic data that could be used as a part of the project.

Coordinate with the MPO, the Planning Manager for TDM, and the Traffic Operations Analysis and Reporting Manager.

Work with the MPO and Planning Manager for the TDM to understand if there are updates to the model function that would affect the project scope or schedule.

E. Determine the Appropriate Traffic Operations Analysis Tool

1. Determine the traffic operations analysis tool to be used in accordance with the UDOT Traffic Analysis Guidelines.
2. Coordinate with the Region Traffic Operations Engineer and, for large projects, the UDOT Statewide Operations Engineer.

IV. INITIAL OPERATIONS & SAFETY IMPROVEMENTS COST ESTIMATE

A. Identify Safety Concerns

1. Coordinate with Local Agencies and Identify Safety Concerns.
2. Obtain additional information regarding the safety issues in the project area.
3. Identify other safety issues or deficiencies by doing the following:
 - Coordinate with area maintenance personnel.
 - Conduct field reviews if necessary.

4. Identify safety mitigation/remedies.
 5. Develop a list of prioritized safety improvements.
- B. Comply with UDOT Crashworthiness Policy
1. Identify any obsolete or prior generation crashworthy items within the project limits.
 2. Comply with the requirements of UDOT Policy 06C-42, which sets the conditions under which projects are required to replace obsolete safety hardware that is wholly or partially within a project's limits.

V. METHODS AND ASSUMPTIONS DOCUMENT

A. Develop Methods and Assumptions Document

1. Determine the methods to be used in the analysis including a description of the analysis tools.
2. Coordinate with the Region Planner, the Region Traffic Operations Engineer and, for large projects, the UDOT Statewide Operations Engineer, to determine if the Traffic Analysis Zones of the TDM need refinement or modification.
3. Develop any assumptions that should be understood early in the process that may impact the outcome of the traffic and safety analysis.
4. Develop a strategy to address the traffic and safety analysis needs of the project.
5. For projects that require FHWA approval, submit the Methods and Assumptions document to the appropriate FHWA Area engineer for approval after the UDOT Statewide Operations Engineer's comments have been addressed.

VI. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Documentation before distribution.

Submit the Methods and Assumptions document for QC to the Region Traffic Operations Engineer.

Include the UDOT Statewide Operations Engineer only for "large projects", which involve an interchange or any section of a freeway, an innovative intersection (such as a continuous flow intersection (CFI), a Diverging Diamond (DDI), or a Thru-Turn) or a regionally significant corridor.

Complete all necessary corrections from the QC check.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

2T1 Develop Initial Traffic Operations & Safety Analysis

Overview

Complete the existing and future traffic operations and safety analyses and provide the draft traffic operations and safety reports outlining specific recommendations for improvements. Update the travel demand model to forecast future volumes for the study area. Develop the appropriate traffic operations models to determine alternatives to accommodate the existing and future traffic demand for all horizon years. Calculate safety impacts of current conditions and proposed alternatives for existing and future traffic demand.

References

Highway Capacity Manual
MUTCD (Manual on Uniform Traffic Control Devices)
Federal Highway Administration Traffic Analysis Toolbox
Federal Highway Administration IACR Guidance Document
UDOT Traffic Analysis Guidelines
MPOs Travel Demand Model (TDM)
UDOT Freeway PeMS (radar traffic point data for speeds, volumes & vehicle classification)
UDOT Clearguide (traffic probe data for travel times & speeds)
UDOT Automated Traffic Signal Performance Metrics (ATSPM)
Highway Safety Manual
NCHRP 687
UDOT Safety Standards and Trainings website
UDOT QC/QA Documentation

Deliverables & Tasks

I. DRAFT TRAFFIC OPERATIONS ANALYSIS REPORT

A. Refine and Calibrate Travel Demand Model (TDM)

1. Refine the TDM to match project needs following methods found in the UDOT Traffic Analysis Guideline and calibrate to match observed data more closely.
2. The revisions are to focus on providing better and more complete future traffic projections and may include:

Adjustments to Traffic Analysis Zone (TAZ) boundaries.

Updates to the transportation network to better match existing or future conditions.

Modifications to existing or future land uses.

Adjustments to better match observed traffic volumes or travel patterns.

3. Coordinate TDM calibration methodology with the MPO, the Region Planner and, for large projects, the UDOT Statewide Operations Engineer.

B. Develop Existing Conditions Traffic Operations Analysis Model

1. Prepare the traffic operations analysis model for use in the study area as described in the UDOT Traffic Analysis Guidelines.

Prepare existing traffic volumes

Obtain existing traffic signal timing

Build the existing traffic operations analysis model that is calibrated/validated to observed field conditions

Submit the Existing Conditions Model to the UDOT Statewide Operations Engineer for review only for large projects that involve an interchange, any section of a freeway, an innovative intersection (such as a continuous

flow intersection (CFI), a Diverging Diamond (DDI), or a Thru-Turn), or a regionally significant corridor.

For all other projects, refer the QC to the Region Traffic Operations Engineer.

C. Develop Future Conditions Traffic Operations Analysis Model

D. Develop Future Alternative Traffic Operations Analysis Models

1. Using the calibrated TDM and traffic operations analysis model, perform an alternatives analysis for potential study area modifications to accommodate future traffic demands in accordance with the UDOT Traffic Analysis Guidelines.

Determine alternatives to be analyzed .

Develop future traffic volume projections for each alternative using existing traffic volume data and the TDM.

Analyze each alternative with the calibrated traffic operations analysis model.

Develop project recommendations including intersection. configurations, the number of lanes (including turn lanes), and recommended queue storage length based on the UDOT Traffic Analysis Guidelines.

Submit the Future Year Alternatives Models to the UDOT Statewide Operations Engineer for review and approval only for large projects which involve an interchange, any section of a freeway, an innovative intersection (such as a continuous flow intersection (CFI), a Diverging Diamond (DDI), or a Thru-Turn) or a regionally significant corridor.

For all other projects, refer the QC to the Region Traffic Operations Engineer.

E. Develop Traffic Operations Summary

1. Prepare a draft of the traffic operations summary.

Include all information necessary to determine and justify the improvement recommendations.

F. Make Preliminary Traffic Operation Improvement Recommendations

1. Create a summary of traffic operations improvement recommendations to provide to the Roadway Designer (1R1).

Be sure to consider traditional improvements prior to moving into the more expensive innovative options, the analysis should support the need to go to the higher level options.

2. Coordinate the traffic operations improvements with the design team to ensure the concepts are accurately reflected in the preliminary design and cost estimate.

II. DRAFT SAFETY ANALYSIS REPORT

A. Safety Analysis For Larger Projects

1. Use Highway Safety Manual methodology and safety evaluations outlined in the UDOT's Safety Standards and Trainings website to perform safety calculations for existing and future conditions and proposed alternatives.
2. Use safety calculations to help in comparing alternatives and decision making.
3. Do predictive analysis safety calculations for:
 - Existing conditions
 - Future conditions (no change)
 - Future alternatives
4. Discussion of recommendations and notes from the updated or new PSA report.

B. Safety Analysis For All Other Projects:

1. Discussion of recommendations and notes from the updated or new PSA report.

C. Identify Safety Mitigation/Remedies

1. Recommend possible mitigation for the identified safety concerns based on the information obtained.

D. Develop Strategy to Make Any Needed Safety Improvements

1. Prioritized list of identified safety improvements.

III. DEVELOP 555 SPECIFICATION, MOT SCHEDULE & CONTRACT DISINCENTIVES

A. Develop 555 Specification, including a MOT (Maintenance of Traffic) Schedule and Disincentives

1. Develop the Maintenance of Traffic Schedule and disincentives for the planned construction year.

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Documentation before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation to be checked.

Document comments from review processes and ensure that each was addressed.

Upload final models and all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3T1 Finalize Traffic Operations & Safety Analyses

Overview

Provide both the final traffic analysis report and safety report and outline specific recommendations for improving existing traffic and safety conditions.

References

Highway Capacity Manual
UDOT Traffic Analysis Guidelines
Federal Highway Administration Traffic Analysis Toolbox
Federal Highway Administration IACR Guidance Document
UDOT QC/QA Documentation

Deliverables & Tasks

I. DRAFT INTERSTATE ACCESS CHANGE REQUEST (IACR) (IF FHWA APPROVAL IS REQUIRED)

A. Prepare/Review Draft Interstate Access Change Request (IACR) and Obtain Approval from FHWA

1. Refer to the FHWA IACR Guidance Document for details on projects that require FHWA approval.

2. For those that meet that criteria:

Provide a draft IACR which includes:

Operations Analysis

Traffic Operations Models

Safety Analysis

Signing Plans

Submit to the UDOT Statewide Operations Engineer and to UDOT Central Traffic & Safety for review.

After their comments have been addressed, submit the adjusted draft IACR to FHWA for approval.

II. FINAL INTERSTATE ACCESS CHANGE REQUEST (IACR) (IF FHWA APPROVAL IS REQUIRED)

A. Prepare/Review Final Interstate Access Change Request (IACR) and Obtain Approval from FHWA

1. Provide the Final IACR which includes:

Operations Analysis

Traffic Operations Models

Safety Analysis

Signing Plans

2. Submit to the UDOT Statewide Operations Engineer and to UDOT Central Traffic & Safety for review.

3. After their comments have been addressed, submit the adjusted Final IACR to FHWA for approval.

III. FINAL TRAFFIC OPERATIONS REPORT (IF AN IACR IS NOT REQUIRED)

A. Finalize Traffic Analysis Report (if IACR is not needed)

1. Update the report based on the modifications to the model.

2. Make recommendations in the report and request approval from the Central Traffic and Safety Department if intersections meet a signal warrant or left-turn warrant.
3. Request Traffic Engineering Order (TEO) from Central Traffic and Safety for proposed changes to posted speed limits.
4. Submit the final traffic analysis report to the Region Traffic Engineer for review.
5. For large projects, submit to the UDOT Traffic Performance Engineer for review.

IV. FINAL SAFETY REPORT (IF AN IACR IS NOT REQUIRED)

A. Finalize Safety Analysis Report (if IACR is not needed)

1. Update the report based on the modifications to the traffic operations model, if safety calculation and analysis is impacted.
2. Request design exception if it is anticipated that it will be needed.
3. If a new traffic signal is warranted, contact the Traffic Studies team at Central Traffic & Safety to check if an Intersection Control Evaluation (ICE) would be appropriate for that intersection.
4. List and discuss/explain selected countermeasures and safety considerations and implications.
5. Submit the final safety analysis report to the Region Traffic Engineer, and for large projects, the UDOT Statewide Safety Programs Engineer, for review.

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Documentation before distribution.

Document comments from review processes and ensure that each was addressed.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

5T1 Deliver Traffic & Safety Certification

Overview

Complete and issue the signed Region Traffic Certification for advertisement.

References

UDOT Advertising Checklist Instructions

Interstate Signing Approval

All new, replaced and removed signs, on the interstate or other freeway, are to be sent to Central Traffic and Safety for review and approval.

Deliverables & Tasks

I. REGION TRAFFIC AND SAFETY CERTIFICATION

A. Issue Region Traffic and Safety Certification

1. A traffic and safety certification is required to verify that all safety features meet current standards, such as:

Striping

Signing

Signals

Lighting

Barriers

Attenuators

Traffic control

2. The Region Traffic Engineer creates, signs and issues the traffic and safety certification.

UTILITIES

2U1 Utility & Railroad Identification

Overview

Begin this activity as soon as possible. Early utility and railroad identification and coordination are critical to the success of the project. Identify all utility and railroad companies and complete an accurate depiction of existing utility facilities within the project limits.

References

Administrative Rule R930-5 Establishment and Regulation of At-Grade Railroad Crossings

Administrative Rule R930-7 Utility Accommodation

Administrative Rule R930-8 Utility Relocations Required by Highway Projects

Utah Code Section 72-6-116

UDOT Bus Rapid Transit Design Manual (BRTDM)

UDOT CADD Standards

UDOT Digital Delivery Website

UDOT Roadway Design Manual (RDM)

UDOT Roadway Design Manual Drawings

UDOT Utility Coordination Manual of Instruction

UDOT QC/QA Documentation

Deliverables & Tasks

I. UTILITY & RAILROAD COMPANIES CONTACT LIST

A. Identify Utility and Railroad Companies within Project Limits

1. Identify all utility and railroad companies within the project limits.
2. Identify the point of contact for each company for project design coordination.
3. Develop a Utility and Railroad Companies Contact List that includes:

Contact name(s)

Phone number

Physical/Mailing address

Email address

II. DEPICTION OF UTILITY FACILITIES/ SUBSURFACE UTILITY ENGINEERING (SUE) LEVEL B, C, & D

A. Notify Utility Companies of Project and Request Utility Records/Plans

1. Contact each utility and railroad company within the project limits.
2. Provide each company with the following:
 - Project area and description.
 - Request for records and plans of their facilities within the project limits and easements or other land rights documentation that may be affected by the project.
 - Coordinate with ROW Lead for UDOT records/research for utility easements and/or land rights.
 - Invitation to scoping meeting at least 30 days prior to the meeting (as applicable).
3. Send the Design Authorization Letter (DAL) to each of the utility companies identified on the project.

B. Hold Utility Scoping Meeting with Utility Companies (as needed)

1. Set up a utility scoping meeting to discuss the project if appropriate.
2. Include all potentially affected utility companies in one meeting.

3. Provide an agenda before the meeting.
4. Finalize the meeting by providing meeting notes of all decisions and important discussions.

Discuss project scope and schedule.

Discuss coordination/communication plan.

Discuss design alternatives that may avoid conflicts.

Discuss utility relocation partnering between utilities, such as the potential of sharing trenches.

Discuss future improvement plans and schedules.

Determine if anything needs to happen before the current project.

Discuss utility relocation review and relocation schedules.

C. Coordinate with Survey Team

1. Coordinate with the Survey Team to gather all overhead and surface utility facilities within the project limits.
2. Good communication with the Survey Team is extremely important to ensure repeat visits are not required.
3. Clearly identify all utility facilities that are needed including the underground facilities that will need to be dipped.
4. Provide plans and records to the Survey Team as appropriate to assist their efforts in locating facilities and understanding what is required.

D. Develop Subsurface Utility Engineering (SUE) Level B, C, and D

1. Use utility company records, field observations, and collected survey information to develop Subsurface Utility Engineering (SUE) Level B, C, and D as applicable to the needs of the project.

Typically quality level B is only provided by a SUE consultant.

2. Provide a complete depiction of the utility facilities within the project limits.
3. Follow UDOT CADD Standards and provide the information in the appropriate project CADD file format.

E. Review Horizontal Location with Utility Owner

1. Provide maps showing the horizontal utility location for all utility owners to review.
2. Address utility owners' review comments and resolve issues with the horizontal locations.
3. Provide updated maps based on comments.

III. AUTHORIZATION FOR DESIGN EXPENDITURES

A. Issue Authorization for Design Expenditures

1. Prepare and issue authorization letters.
2. The Consultant may prepare the letters but they must be signed and issued by the Region Utility and Railroad Leader.
3. Include a Project Scoping Meeting invitation with each authorization letter.

IV. DOCUMENTATION OF RAILROAD DIAGNOSTIC REVIEW (AS NECESSARY)

A. Obtain Diagnostic Review (For At-Grade Railroad Crossings Only)

1. The diagnostic team decides and formalizes track configuration commitments for grade separation structures.
2. The Region Utility and Railroad Leader contacts Chief Railroad Engineer to initiate diagnostic review.

The Chief Railroad Engineer provides diagnostic review.

Refer to rule R930-5 Establishment and Regulation of At-Grade Railroad Crossings.

Provide the railroad company 30 days notice before diagnostic review.

Notify the railroad company of the impending construction and request their updated facility plans.

Provide a project area map and description.

Develop a railroad reviews plan.

The Chief Railroad Engineer uses Form R-709 to request Railroad Crossing Safety Funds for eligible at-grade crossings.

The Chief Railroad Engineer provides the funding estimate to the Region Utility and Railroad Leader.

3. The diagnostic review provides at-grade crossing design preparation recommendations.

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Utility Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3U1 Identify Potential Utility Conflicts

Overview

Identify potential utility conflicts through coordination with utility owners and designers. Obtain preliminary relocation costs from utility owners.

References

Administrative Rule R930-7 Utility Accommodation
Administrative Rule R930-8 Utility Relocations Required by Highway Projects
UDOT Bus Rapid Transit Design Manual (BRTDM)
UDOT CADD Standards
UDOT Digital Delivery Website
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings
UDOT Standard Design Drawing 09
UDOT Utility Coordination Manual of Instruction
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY UTILITY CONFLICT MATRIX/SUMMARY

A. Evaluate Potential Utility Conflicts

1. Determine all potential utility conflicts and organize them in a matrix summary using the current design files.
2. Meet with project team designers to discuss potential conflict locations and determine reasonable design modifications to avoid or minimize utility impacts.
3. Develop a preliminary utility conflict matrix summary based on design modifications.

B. Coordinate Utility Information Meeting

1. Submit the preliminary utility conflict matrix summary to affected utility companies.
2. Submit appropriate design files to affected utility companies for review.
3. Schedule a utility owner meeting.
4. Meet on site to discuss potential conflicts and relocations.

C. Hold Utility Information Meeting

1. This meeting is to discuss each utility conflict and determine the resolution for each.
2. Send the following to each utility owner before the meeting:
 - Utility Information Meeting notification letter
 - Utility conflict matrix
 - Applicable project design filesMeeting Agenda, use the following discussion topics as needed:
 - Review the project scope and schedule
 - Discuss all potential conflicts
 - Discuss relocation efforts and schedules
 - Discuss utility outage windows and limitations
 - Discuss partnering opportunities
 - Discuss alternative designs to avoid or limit relocations
 - Discuss locations needing vertical identification
 - Potential Utility Betterments
 - Discuss utility company concerns with DAL

3. Develop meeting notes and include all decisions, important discussions, action items, and schedule.
4. Circulate the meeting notes to all attendees to assure all decisions and discussions were recorded correctly.
5. Issue DAL if any utility company has not received a letter.

II. INITIAL UTILITY COMPANY COST ESTIMATE(S)

A. Compile Initial Utility Company Cost Estimate(s)

1. Obtain initial utility relocation cost estimate from each impacted utility.
2. Provide cost estimate(s) to the Design Leader for inclusion in the total project cost estimate.

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Utility Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3U2 Initial Design Utility Coordination

Overview

Conduct a utility design meeting to facilitate relocation solutions. Facilitate the development of utility owner relocation plans.

References

Administrative Rule R930-7 Utility Accommodation
Administrative Rule R930-8 Utility Relocations Required by Highway Projects
UDOT Bus Rapid Transit Design Manual (BRTDM)
UDOT CADD Standards
UDOT Digital Delivery Website
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings
UDOT Utility Coordination Manual of Instruction
UDOT QC/QA Documentation

Deliverables & Tasks

I. REVISED UTILITY CONFLICT MATRIX/SUMMARY

A. Re-evaluate Utility Conflicts

1. Re-evaluate utility conflicts and revise the utility conflict matrix summary using the current design files.
2. Meet with project team designers to discuss design modifications to avoid or minimize utility impacts.
3. Revise the utility conflict matrix summary based on updated design.
4. Identify conflict locations that need vertical (SUE level A) verification.
5. Develop a cost estimate for the SUE level A verification efforts.

II. UTILITY COMPANY PLANS, SCHEDULES, AND COST ESTIMATES REQUEST

A. Hold Utility Design Meeting

1. This meeting is to discuss each utility conflict and determine the resolution for each.
2. Send the following to each utility owner before the meeting:
 - Utility Design Meeting notification letter
 - Utility Conflict Matrix
 - Applicable project design plans/files
 - Meeting Agenda, use the following discussion topics as needed:
 - Project scope and schedule
 - Constructability issues
 - Each utility conflict
 - Utility work included in UDOT's plans
 - Specifications to be included
 - Utility partnering
 - Use of UDOT's contractor
 - Utility Betterments
3. Complete and distribute meeting notes documenting all decisions, important discussions, action items, and schedule.

B. Request Utility Company Plans, Schedules, and Cost Estimates

1. Send requests in a timely manner to allow for all utility agreements to be completed before letting the project contract and to allow for relocations to occur in advance of construction, where possible.
2. Send each utility owner a set of preliminary project plans and a relocation plan request letter.

The request letter should request the following:

- Request relocation plan utilizing the project plan sheets.
- Request a detailed schedule.
- Request an itemized cost estimate for utility relocations.
- Request contact information for the utility representative who will manage the relocation.
- Request information to be incorporated into the UDOT contract documents.

The plans should be complete and include the following:

- Location, type, size, material, and class of all existing facilities.
- Relevant information such as voltage and operating pressure.
- Temporary relocations/adjustments to facilities.
- Permanent relocations/adjustments to facilities (horizontal and vertical).
- Facilities that will be left in place or removed and not replaced.
- Construction stages for relocations
- Dimensions from critical project features such as Right-of-Way, highway centerline, ramps, and bridges.

3. Set a deadline for utility owners to submit requested information.
Include time for processing agreements.

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Utility Design QC Checklist before distribution.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the QC checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3U3 Identify Utility Depth (SUE Level A)

Overview

Use the Utility Conflict Matrix Summary to determine specific locations where vertical information could be used to avoid existing utility facility conflicts or assist utility companies design relocation plans.

References

Risk Register (1Z4)

Utility Conflict Matrix/Summary (3U2)

Deliverables & Tasks

I. SUE LEVEL A FILE

A. Coordinate with SUE Consultant for SUE Level A Exploration of Existing Utilities

1. Provide SUE Consultant with locations identified in 3U2 (Utility Conflict Matrix/Summary) to conduct SUE Level A Exploration.

B. Review SUE Level A MicroStation File

1. Verify SUE Level A MicroStation file (provided by SUE Consultant) is in the project coordinate system with all requested test hole locations displayed and identified completely.

II. SUE MAPPING FILE CERTIFICATION

A. Verify SUE Mapping File Certification

1. Verify SUE Consultant's SUE Mapping File Certification was uploaded onto ProjectWise.

3U4 Complete Utility & Railroad Designs

Overview

Complete utility relocation designs for all utility relocations for which UDOT is responsible. Develop preliminary utility relocation plan sheets and cost estimate. Develop at grade railroad crossing plans and verify Diagnostic Report and railroad company guidelines compliance. Refer to Structures Discipline Track for grade separation structure design tasks.

References

Administrative Rule R930-7 Utility Accommodation
Administrative Rule R930-8 Utility Relocations Required by Highway Projects
UDOT Bus Rapid Transit Design Manual (BRTDM)
UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings
UDOT Utility Coordination Manual of Instruction
Utility Owner Standard and Specifications
UDOT Standard Drawings and Standard Specifications
UDOT Standard Design Drawing 09
Railroad Company Standards and Specifications
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. PRELIMINARY UTILITY RELOCATION PLAN SHEETS

A. Coordinate with Project Team Members

1. Continually coordinate with project team members.
2. Discuss aspects of the model and design with appropriate disciplines to ensure compliance with standards, with other designs, and address fatal flaws.
3. Coordinate and mitigate project design conflicts, impacts, and deficiencies.

B. Complete Utility Relocation Design

1. Refer to the utility owner's standards and specifications to complete the utility relocation design.
2. Assist other disciplines in evaluating possible design modifications to avoid or minimize utility impacts.
3. Conform to all applicable depth of bury, utility separation, vertical clearance, clear zone, and ROW accommodation requirements.
4. Conform to UDOT Standard Drawings.
5. Design horizontal and vertical ties.
6. Include utility betterment designs when applicable.
7. Coordinate relocation designs with other disciplines.
8. Conform to UDOT CADD Standards.

C. Develop Preliminary Utility Plan Sheets

1. Follow the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website to develop preliminary utility relocation plan sheets for review.
2. These sheets are to provide a review of the utility relocation design.

3. It is recommended that only the information required for final utility design review be placed on the sheets at this time.
 4. Verify with the project manager the expected level of effort for the review submittal.
 5. QC review is required before distribution for all labels, callouts, notes, and information found on the plan sheets.
 6. For all utility relocation sheets, do the following:
 - Combine with other sheets whenever possible.
 - Follow the UDOT Plan Sheet Development Standards—General Plan Sheet Requirements, when generating plan sheets, drafting, referencing, and callouts.
 - Follow the UDOT Plan Sheet Development Standards—Utility and Utility Relocation Sheet Requirements.
 - Provide all information needed for review including size, type, and material.
 - Label all streets and important existing features.
 - Ensure all existing features are displayed in proper grayscale.
 7. If more detailed utility relocation sheets are required:
 - Use applicable requirements from UDOT Plan Sheet Development Standards—Roadway Plan & Profile Sheet Requirements.
 - Provide all callouts and labels necessary to review the relocation design.
- D. Coordinate with Utility Owner
1. Coordinate a review of the utility relocation design with the utility owner.
 2. Address all review comments and make necessary revisions.

II. GRADE SEPARATION STRUCTURE 30% SITUATION & LAYOUT (S&L) SUBMITTAL PACKAGE

A. Submit Structure 30% S&L Submittal Package to Railroad Companies (if applicable)

1. Review for content and submit the Structure 30% S&L package prepared by the Structural Design Engineer to the railroad companies' local representative.
2. Refer to the respective railroad company's guidelines for submittal content.
3. Content may include the following:
 - Design Plans
 - Project Specifications and Special Provisions
 - Drainage Report
 - Shoofly Design (if applicable)
 - Construction Phasing Plans
4. Inform the railroad companies that they will have an opportunity for a final review of the S&L plan sheets with the 100% submittal.
 - However, consensus must be reached on overall geometry at this time.
 - It is important that the railroad companies are kept informed in the earlier stages to avoid impacts to the project schedule.

III. 100% AT-GRADE RAILROAD CROSSING SURFACE & WARNING DEVICE PLANS

A. Develop At-Grade Railroad Crossing Design

1. Develop the proposed at grade crossing including, but not limited to, the following:
 - Warning Device design
 - Grading

- Pavement section
- Lane transitions
- Cut/fill lines
 - Identify additional ROW impacts
 - Identify additional utility impacts
- Maintenance Access
- Fences
- Pedestrian Access
- Raised Islands
- Removals
- Trails
- Preliminary Signing

2. Evaluate clear zone hazards and appropriate protection devices.
3. Conform to Railroad Company standards.
4. Conform to UDOT standards.
 - Roadway Manual of Instruction
 - UDOT Standard Drawings
5. Calculate quantities.

B. Prepare Preliminary At-Grade Railroad Crossing Plan Sheets

1. Follow current Railroad Company requirements and standards and UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website to create railroad crossing plan sheets.
2. Create all necessary sheets for a railroad crossing review.
3. Label all important design features.
4. Include utility, ROW, and drainage information.
5. Include all Railroad Company required information.

C. Submit 100 % At-Grade Railroad Crossing Sheets and Forms for Railroad Company Review

1. Follow the current Railroad Company requirements to complete and submit all required forms.
2. Prepare all forms and documents the Railroad Company requires for review.
3. Submit review plans and forms to the Chief Railroad Engineer.
4. Submit plans and forms to the railroad company for review and comments.
 - Request the preliminary surface and signal cost estimate from Union Pacific Railroad for their facility modifications.
 - Incorporate facility modification requests from UTA or other private owners into the schedule and cost estimate.

IV. UTILITY RELOCATION/AT GRADE RAILROAD CROSSING COST ESTIMATE

A. Develop Utility Relocation/At-Grade Railroad Crossing Cost Estimate

1. Compile utility relocation and railroad crossing bid items and quantities.
 - Use UDOT standard bid items.
2. Develop unit costs for each item.
 - Use appropriate resources for developing unit costs such as Masterworks and local contractors.
 - Document unit cost development and assumptions.
 - Account for project specific factors:
 - Location
 - Time of year
 - Limitations of operation

Quantity of item
Current bidding environment
Availability of materials
Familiarity of process
Specialty equipment
Risk to contractor
Inflation
Construction Schedule
Constructability

3. Use lump sum pricing only when appropriate.
Consider contractor risk due to unknown quantity.
Consider difficulty in pricing per unit.
Consider all materials and labor involved.

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Utility Design QC Checklist before distribution.
Provide the Checker with a check print of each deliverable and supporting documentation.
Complete all necessary corrections from the QC checklist.
Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4U1 Final Design Utility Coordination

Overview

Final coordination with utility owners and provide guidance and information to complete utility relocation plans. Hold a meeting to resolve any remaining conflicts and prepare for the construction stage.

References

Administrative Rule R930-7 Utility Accommodation

Administrative Rule R930-8 Utility Relocations Required by Highway Projects

UDOT Utility Coordination Manual of Instruction

UDOT Standard Design Drawing 09

UDOT QC/QA Documentation

Deliverables & Tasks

I. UTILITY COMPANY PLANS, SCHEDULES, & COST ESTIMATES

A. Hold Final Utility Design Meeting

1. This meeting is to discuss and resolve remaining conflicts or issues.
2. Prior to the meeting, send a meeting agenda, updated project plans/files and updated utility conflict matrix to all attendees.
3. Use the following discussion topics as needed:
 - Project scope and schedule
 - Constructability issues
 - Remaining conflicts
 - Specifications to be included
 - Utility partnering
 - Construction schedules
 - Utility outage windows and limitations
 - Use of UDOT's contractor
 - Utility betterments
4. Complete and distribute meeting notes documenting all decisions, important discussions, action items, and schedule.

B. Review Utility Company Plans, Schedules, and Cost Estimates

1. Review the final utility plans, schedules, and cost estimates for compliance with project design and goals.
2. Coordinate and resolve any deficiencies with the utility owner.

4U2 Prepare & Obtain Utility & Railroad Agreements & Permits

Overview

Prepare and obtain Individual Utility Agreements, Cooperative Agreements, Construction and Maintenance Agreement, and Permits required for project advertisement and construction.

References

Administrative Rule R930-7 Utility Accommodation
Administrative Rule R930-8 Utility Relocations Required by Highway Projects
UDOT Betterment Agreement
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings
UDOT Utility Coordination Manual of Instruction
UDOT QC/QA Documentation

Deliverables & Tasks

I. EXECUTED INDIVIDUAL UTILITY AGREEMENTS

A. Complete Utility Agreements

1. The Consultant Utility Coordinators may prepare Reimbursement, Betterment, and Cooperative Agreements for submittal and review by the UDOT Project Manager and Region Utility and Railroad Leader.
2. The Region Utility and Railroad Leader sends the information for the R-709 to Program Finance.
3. The Agreements are signed by the Utility Company and on behalf of UDOT.
4. The Comptroller's office executes the signed Agreements.
5. Distribute the executed copies.

II. EXECUTED COOPERATIVE AGREEMENTS WITH MUNICIPALITIES & SERVICE DISTRICTS

A. Complete Cooperative Agreements

1. Coordinate with the local municipalities to develop cooperative agreements as needed.

III. EXECUTED RAILROAD AGREEMENTS & LICENSES

A. Complete Railroad Agreements and Licenses

1. Upon receipt of cost estimates and instruction from railroad owners, the Region Utility and Railroad Leader incorporates the project information into the Railroad Agreement or provides information to UTA for preparation of the Agency License Agreements.
2. The Railroad Crossing Designer provides the Region Utility and Railroad Leader with an estimated railroad flagging duration to complete required at-grade railroad crossing modifications.
3. This duration is included in the Agreement or License.
4. The Region Utility and Railroad Leader assembles the exhibits including approved plans, cost estimates and right of way documents for the Railroad Agreements and Licenses.
5. Consultants may prepare the Railroad Agreement and information for submittal and review by the UDOT Project Manager and the Region Utility and Railroad Leader.

6. The Region Utility and Railroad Leader sends the information for the R-709 to Program Finance.
7. The Agreement signed on UDOT's behalf and executed by the Comptroller's office.
8. Authorize the Railroad Companies to proceed with work.
9. Distribute executed copies

IV. WIRELINE, PIPELINE, AND LICENSE APPLICATIONS

- A. Prepare and Submit Wireline, Pipeline, and License Applications for Utilities in Railroad ROW

V. AUTHORIZATIONS TO PROCEED WITH WORK FOR UTILITY COMPANIES

- A. Provide Authorization to Proceed with Work for Utility Companies
 1. Sign and distribute documents authorizing Utility Companies to proceed with work.

VI. QC DOCUMENTATION

- A. Perform QC Review
 1. Perform the QC Review following the UDOT QC/QA Procedures and the Utility Design QC Checklist before distribution.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the QC checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4U3 COMPLETE UTILITY & RAILROAD PLANS & DOCUMENTS

Overview

Complete utility plans and documents. Obtain the UDOT Chief Railroad Engineer's and Railroad Company approval for the crossing modification or construction plans. Finalize railroad crossing plan sheets and develop all railroad project documents including Railroad Company required special provisions. Obtain executed construction and maintenance agreements from the Railroad Company.

References

Administrative Rule R930-7 Utility Accommodation
Administrative Rule R930-8 Utility Relocations Required by Highway Projects
UDOT Bus Rapid Transit Design Manual (BRTDM)
UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT Roadway Design Manual (RDM)
UDOT Roadway Design Manual Drawings
UDOT Utility Coordination Manual of Instruction
UDOT Specification Writer's Guide
UDOT Standard Drawings and Standard Specifications
UDOT Standard Design Drawing 09
Masterworks
UDOT QC/QA Documentation

Deliverables & Tasks

I. UTILITY RELOCATION PLAN SHEETS

A. Address Plan-in-Hand Review Comments

1. Complete the utility relocation/railroad portions of the Plan-in-Hand Review Comment Resolution Form.
2. Respond to each utility relocation/railroad related comment.
3. Make revisions to the design and deliverables according to the responses.
4. Conduct QC review and verification of all comments.
5. See UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

B. Finalize Utility Relocation Design

1. Finalize the utility relocation design based on review comments and coordination with team members.
2. Refer to 3U4 as needed.

C. Complete Utility Relocation Plan and Profile Sheets

1. Follow the current UDOT CADD Standards and UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website to finalize the utility relocation plan sheets.

Follow the UDOT Plan Sheet Development Standards—Topo and Utility Sheet Requirements.

Follow the UDOT Plan Sheet Development Standards—Utility Relocation Sheet Requirements.

Follow additional applicable PSDS requirements for more extensive designs and details.

UDOT Plan Sheet Development Standards—Roadway Plan and
Profile Requirements

UDOT Plan Sheet Development Standards—Detail Sheet
Requirements

2. Revise and update information labeled in previous review submittals as necessary.
3. Include all quantities and start/end stations.
4. Verify that the callouts are correctly placed and labeled.

D. Complete Utility Relocation Summary Sheets

1. Prepare summary sheets according to UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website and Summary Sheet CADD Standards.

General Plan Sheet Requirements (Department or Region)
Summary Sheet Requirements.

2. Use UDOT Excel spreadsheets and customize for the project
Include all utility relocation related pay items and necessary non-pay items.
Include names, alignment designations, stations, offsets, units, and quantities.
Show enough detail to support calculations.
3. Use UDOT standard summary plan sheets
4. Export all summaries from Excel to MicroStation.

II. GRADE SEPARATION STRUCTURE 100% SUBMITTAL PACKAGE

A. Submit Structure 100 % Submittal Package to Railroad Companies
(if applicable)

1. Review for content and submit the 100% Railroad Company Submittal Package prepared by the Structural Design Engineer to the railroad companies' local representative.
2. Refer to the respective railroad company's guidelines for submittal content.
3. Content may include the following:
 - Design Plans
 - Project Specifications and Special Provisions
 - Drainage Report
 - Shoofly Design (if applicable)
 - Construction Phasing Plans

III. AT-GRADE RAILROAD CROSSING PLAN SHEETS

A. Finalize At-Grade Railroad Crossing Improvements Design

1. Finalize the railroad crossing design based on review comments and coordination with team members.
2. Refer to 3U4 as needed.

B. Complete At-Grade Railroad Crossing Improvements Plan Sheets

1. Follow current UDOT CADD Standards, UDOT Plan Sheet Development Standards or the UDOT Digital Delivery Website and Railroad Company standards to finalize the utility relocation plan sheets.
2. Update and include all necessary information such as callouts and notes. Include all necessary details.
3. Follow UDOT Plan Sheet Development Standards Detail Sheet Requirements.

IV. UTILITY RELOCATION/AT-GRADE RAILROAD CROSSING COST ESTIMATE

A. Finalize Utility Relocation/At-Grade Railroad Crossing Cost Estimate

1. Update bid items and quantities
2. Update unit costs (see 3U4)

B. Enter Utility Relocation/At-Grade Railroad Crossing Cost Estimate into Masterworks

UTILITY RELOCATION/AT-GRADE RAILROAD CROSSING PROJECT DOCUMENTS

A. Develop Utility Relocation/At-Grade Railroad Crossing Project Documents

1. Incorporate utility information into utility special provisions and limitations of operations.

Provide all special provisions required for project construction.

General Special Provisions

Project Specific Special Provisions

2. Use Masterworks to generate M&P for all bid items.

Develop M&P for all non-standard bid items.

Include accurate description for all effort and materials required for construction.

M&P pay items must match plan sheet pay items exactly.

3. Use Masterworks to generate A&D for all standard pay items.

Coordinate with the RE to develop A&D for non-standard items.

VI. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Utility Design QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

5U1 Deliver Utility Certification

Overview

Complete and issue the Utility Certification for advertisement.

References

Administrative Rule R930-7 Utility Accommodation

Administrative Rule R930-8 Utility Relocations Required by Highway Projects

UDOT Utility Coordination Manual of Instruction

UDOT Advertising Checklist Instructions

If Local Government Project

On Local Government projects, the Local Government's Representative reviews the final plans and reimbursement agreements and stores the documents for possible future audits. He or she also signs and submits the Utility Certification on local agency letterhead to the UDOT PM certifying the following:

All utility companies have been notified per Utah Code 54-3-29 and Reimbursement Agreements have been prepared unless the Local Agency is legally prohibited from reimbursing based on Code or Franchise.

Buy America requirements have been addressed.

Local Agency's Utility Accommodation Policy requirements equal or exceed UDOT's Accommodation Rule.

Deliverables & Tasks

I. UTILITY CERTIFICATION

A. Issue Utility Certification

1. UDOT must enter into a formal agreement with all Utility and Railroad companies whose facilities are impacted by the project.
2. Utility Certification is needed to verify all utility conflicts have been properly coordinated and accommodated.
 - Buy America requirements have been addressed
 - Utility limitations on the project have been disclosed
 - UDOT performed work is identified
 - Contact information is included in advertising documents
 - Agreements are properly prepared and executed with affected utility owners.
3. The Region Utility and Railroad Leader creates, signs, and issues the utility certification.

6U1 Utility Construction Services

Overview

Facilitate advance utility relocations prior to UDOT's contractor starting work where appropriate. Coordinate the transfer of information obtained during the utility design phase to construction. Continue coordination with contractors and utility companies through the construction phase.

References

UDOT Standard Drawings and Standard Specifications
UDOT Utility Coordination Manual of Instruction
Contractor's Baseline Schedule/Monthly Updates
Executed Utility Agreements
UDOT Specification Section 00555 Prosecution and Progress
UDOT Specification Section 00727 Control of Work
Utility Conflict Matrix for the project

Deliverables & Tasks

I. ADVANCE RELOCATION OF UTILITIES

A. Advance Relocation of Utilities

1. When advance relocation work is feasible and cost effective, utility owners may complete their relocations prior to the UDOT contractor's work.
2. Responsibility for clearing and grubbing, surveying, traffic control, and resurfacing/restoration must be described in the relocation agreement.
3. Relocate utilities according to design plans.

B. Utility Relocation During Project Construction

1. Provide staking and other pre-work activities to allow utility companies to successfully relocate their facilities in coordination with UDOT's contractor.
2. Relocate utilities according to design plans.

II. COORDINATION MEETINGS

A. Attend Pre-bid Meeting (optional)

1. On projects that involve railroad coordination or complex utility relocations and coordination during construction, consider holding a pre-bid meeting.
2. The Project Manager and Resident Engineer work with the Region Utility and Railroad Leader to invite plan holders along with the appropriate local government agencies, railroad company representatives, and utility companies to address relocation/adjustment requirements, other issues, and construction scheduling.
3. Often pre-bid meetings will involve other items and parties beyond utility companies.
4. Refer to UDOT Contract Documents for specific items to discuss at the meeting.

Possible topics include:

Limitations and coordination efforts based on project specifications and seasonal restrictions.

Questar Gas Company cannot interrupt IHP lines between November and March and HP lines between October 1 and April 1 without written permission.

Rocky Mountain Power cannot schedule line outages on transmission lines between May 1 and September 1.

Most telecommunication companies cannot schedule line splicing between Thanksgiving and New Year's day, or on Mother's day.

Irrigation lines cannot be taken out of service between April 15 and October 15.

All utility companies have strict regulations for notifying customers in advance of service interruptions.

Utilities long lead procurement items and scheduling/contracting of work crews.

Pre-work required prior to utility commencing.

Constructability issues such as cuts, fills, structures, and work sequencing.

B. Attend Pre-Construction Meeting (mandatory)

1. Within 14 calendar days of receiving the Notice of Award, the Resident Engineer and the UDOT contractor schedule the preconstruction conference.
2. Using the utility contact information provided in the contract documents and the Region Utility and Railroad Leader, invite all utility company representatives to the Preconstruction Meeting.
3. Provide a final set of project plans to each utility company as well as related contract document information involving utilities.
4. Refer to UDOT Contract Documents for specific items to discuss at the meeting.

Possible topics include:

Limitations and coordination efforts based on project specifications and seasonal restrictions.

Questar Gas Company cannot interrupt IHP lines between November and March and HP lines between October 1 and April 1 without written permission.

Rocky Mountain Power cannot schedule line outages on transmission lines between May 1 and September 1.

Most telecommunication companies cannot schedule line splicing between Thanksgiving and New Year's day, or on Mother's day.

Irrigation lines cannot be taken out of service between April 15 and October 15.

All utility companies have strict regulations for notifying customers in advance of service interruptions.

Utilities long lead procurement items and scheduling/contracting of work crews.

Pre-work required prior to utility commencing.

Constructability issues such as cuts, fills, structures, and work sequencing.

5. At the Preconstruction Meeting, the UDOT contractor, with UDOT oversight, works with the utility companies to review and discuss the proposed sequence of operations and to set a more exact schedule for relocation of the utility facilities in the field.

They also coordinate the timing of the relocation of utilities with the project construction activities using the utility information in the limitations of operations, utility special provisions, and the approved relocation plans.

This discussion should include addressing the pre-work items from the UDOT contract documents that the contractor may need to do before completing utility relocations.

C. Attend Partnering Meetings (optional)

1. Include Region Utility and Railroad Leader and key utility and railroad company representatives in partnering meetings.

D. Attend Construction Team Meetings (as required by the work schedule)

1. Invite utility companies to regular team meetings as required by the work schedule and coordination needs of the project.
2. The UDOT contractor is required to submit a Baseline Construction Schedule at the Pre-Construction Meeting along with monthly updates to the Resident Engineer addressing the following items:
 - Coordinate all activities and interaction with other entities.
 - Clearly define significant interaction points.
 - Include milestones and coordination points.
 - Include a narrative on how coordination with other entities will be handled.
3. The Baseline Construction Schedule must be consistent with the utility information included in the limitations of operations and special provisions.
4. It is important that the UDOT contractor coordinate work schedules with the utility companies and not assume that work can be completed by the utility companies at any given time.
5. Adjust and revise the schedule for relocation of utility facilities, including milestones and coordination points.

MEETINGS

1V1 Kickoff Meeting

Overview

Prepare for and hold the initial project team meeting. The purpose of the meeting is to introduce team members, familiarize the team with the project, review the proposed project scope, schedule, and budget, and to commit to the project's success.

References

Team UDOT Guide

Deliverables & Tasks

I. KICKOFF MEETING AGENDA

A. Develop Meeting Agenda

1. Plan the time and location.
2. Identify and schedule resources such as vehicles and drivers.
3. Prepare and distribute the agenda for review before the meeting.

The following are potential agenda items and materials:

Field Visit
Team Member Introductions Including Role on the Project
Project Location
Concept Report
Scope, Schedule, and Budget
Risk Register (2Z1)
Aesthetics and Landscape Assessment
Maintenance of Traffic
Problem areas identified by Maintenance
Project Communication Plan
UDOT QC/QA Documentation
Draft Project Definition Document (PDD)
Lessons Learned from Previous Projects
Transportation Solution additions
Project Safety Analysis
Maintenance/Pre Construction Site Visit

B. Invite Meeting Attendees

1. Invite all potential project team members.
2. Include the following with the invitation:
Meeting Agenda
Proposed Scope, Schedule, and Budget
Draft PDD
Concept Report (if available)
3. Refer to Preface - Project Coordination section for a listing of required attendees.

C. Hold Meeting

1. Conduct the meeting according to the agenda.
2. Provide the following at the meeting:
Concept Report
Project Location Mapping such as USGS Quads, GoogleEarth, and As-Builts
Draft Project Definition Document (PDD)

II. KICKOFF MEETING NOTES

A. Compile Meeting Notes

1. Develop meeting notes and distribute them to all invitees for comment and review.

2. Include the following:

Decisions

Action Items

Revisions to Draft PDD

Scope

Objective Statement

Schedule

Budget

Risk Register

Communication expectations

III. PROJECT COMMUNICATIONS PLAN

A. Develop/Revise Project Communications Plan

1. Based on discussions at the Kickoff Meeting, establish the communications plan.

This should include a commitment to how the team members will communicate with each other throughout the project.

See Team UDOT Team Building Guide, "Plan Your Communication" section for suggestions.

IV. DRAFT PROJECT DEFINITION DOCUMENT (PDD)

A. Revise Project Definition Document (PDD)

1. Based on discussions at the Kickoff Meeting, update the draft PDD to reflect the appropriate scope, schedule, budget, and risks associated with the project.

V. UPDATED SCHEDULING SOFTWARE AND RISK REGISTER

1V2 SCOPING MEETING

Overview

This meeting is to develop a clear project scope, schedule, and budget to which all team members agree. Renew commitments so they all concur with the new scope, schedule, and budget. Identify any changes to the initial first cut geometry and all ensuing alterations to other disciplines based on those modifications. Review, negotiate, and set scheduling software durations.

References

Qualitative Risk Worksheet (Developed in separate Risk Review 1Z4)

Price + Time Bidding (P+T)

Deliverables & Tasks

I. SCOPING MEETING AGENDA

A. Prepare Meeting Agenda

1. Arrange for the location and time of the meeting.
2. Prepare the meeting agenda.

Suggested agenda items:

Project Definition Document (PDD)
Duration, hours, and logic in Scheduling Software
Constructability issues that may impact project costs, project schedule, and construction phasing
Preliminary Cost Estimate
Transportation Management Plan (3Z1)
Project Design Certification (PDC)
Problem areas identified by Maintenance
Multimodal needs
Design exceptions
Innovative contracting opportunities such as lane rental, P+T, and incentive/disincentive
Project schedule, including milestones and Submit for Advertising Date in Scheduling Software
Possible schedule impacts, budget changes, or additional design effort
Schedule for team meetings
UDOT QC/QA Documentation

II. SCOPING REVIEW MATERIAL

A. Distribute Review Material

1. Invite all project team members and others as needed.
2. Distribute all review materials and meeting agenda at least one week before the Scoping Meeting.
3. See the Preface - Project Coordination section for a listing of required attendees.
4. Distribute review materials to the following if the project includes applicable items:

Central Traffic & Safety
Structures
FHWA Representative

Central Geotechnical
Central ROW Representative
Central Hydraulics
Fiber Business Manager
Consultant Design Team
Statewide Transit Engineer

III. SCOPING MEETING NOTES

Hold Meeting

Hold the meeting according to the agenda.

Compile Meeting Notes

Compile the meeting notes and distribute them to all team members.

IV. RISK REGISTER & MITIGATION STRATEGIES

A. See 1Z4 for guidance

1. Depending on the size and scope of the project, this can be developed in the Scoping Meeting or in a stand-alone risk meeting (1Z4).

B. Determine if the project risk meets the criteria to be escalated to initiate a Value Engineering (VE) Study or if the project team determines that a VE Study is needed, see 2Z1 for guidance.

V. REVISED PROJECT SCOPE, SCHEDULE, AND BUDGET

A. Revise PDD

1. Revise project scope, schedule, and budget based on discussions at the Scoping Meeting.

B. Review/Update Scheduling Software

1. Confirm that all disciplines have updated the scheduling software durations according to discussions at the Scoping Meeting.

2. Evaluate project completion and milestone meeting dates.

3. Evaluate resource allocation.

C. Set Internal PE Budget

1. Review scope and individual discipline projected hours to set the PE budget for the project.

VI. PROJECT DEFINITION DOCUMENT (PDD)

A. Review the PDD for Signature

1. Finalize and submit the PDD for Signature, if the plan-in-hand meeting is waived for project type.

2V1 Geometry Review Meeting

Overview

This meeting is to review the recommended project alignments, consistency, accuracy, and constructability within the project scope and review the budget. The Geometry Review Meeting may not be eliminated based on the project scope and schedule unless previously approved by the Preconstruction Engineer and Project Manager.

References

Price + Time Bidding (P+T)

Form F1 - Milestone Review Comment Resolution Form

UDOT QC/QA Documentation

Deliverables & Tasks

I. GEOMETRY REVIEW MEETING AGENDA

A. Prepare Meeting Agenda

1. Arrange for the location and time of the meeting.
2. Prepare the meeting agenda.

Suggested agenda items:

- Project Definition Document (PDD)
- Action items from previous milestone review meetings
- Project Design Certification (PDC)
- Design exceptions or deviations from standards
- Design conflicts between disciplines
- Constructability issues
- Project phasing and Maintenance-of-Traffic (MOT)
- Project Cost Estimate
- Risk Register and Mitigation Strategies
- Innovative contracting opportunities such as lane rental, P+T, and incentive/disincentive
- Project schedule, milestones and Submit for Advertising Date
- ROW strategy
- UDOT QC/QA Documentation
- Project commitments
- Review VE recommendations

II. GEOMETRY REVIEW PACKAGE

A. Distribute Review Package

1. Invite all project team members and others as needed.
2. Distribute all review materials and meeting agenda at least one week before the Geometry Review Meeting.
3. See the Preface - Project Coordination section for a listing of required attendees.
4. Distribute review materials to the following if the project includes applicable items:

- Irrigation Company Representative
- Central Traffic & Safety
- Structures
- Central Hydraulics
- Statewide Transit Engineer

Central Geotechnical
Central ROW Representative
FHWA Representative
ICE
Consultant Design Team
Fiber Business Manager
ITS Project Manager
CMGC Contractor

III. GEOMETRY REVIEW MEETING NOTES

A. Hold Meeting

1. Conduct the meeting according to the agenda.

B. Compile Meeting Notes

1. Capture all decisions made and create an action item list.
2. Distribute the meeting notes to all meeting invitees.

C. Update the PDD

1. The Project Manager should revise the project information in the PDD based on any changes identified during the Geometry Review Meeting.

IV. GEOMETRY REVIEW COMMENT RESOLUTION FORM

A. Compile Geometry Review Comments and Submit Initial Dispositions and Responses

1. The Design Leader compiles all reviewer comments into one Geometry Review Comment Resolution Form.
2. Each Discipline Lead provides an initial disposition and response to comments related to their design and deliverables.
Refer to UDOT QC/QA Documentation for more information about completing the Form F1 - Milestone Review Comment Resolution Form.
3. The Design Leader submits the Geometry Review Comment Resolution Form to all reviewers and team members once all comments have an initial disposition and response.

3V1 Plan-in-Hand Review Meeting

Overview

The Plan-in-Hand review is the review of all major roadway, hydraulic, drainage, ITS, utility, geotechnical, and ROW designs. The meeting should include reviews of budget, along with design consistency, accuracy, and constructability within the project scope. The Plan-in-Hand Review Meeting may not be eliminated based on the project scope and schedule unless previously approved by Preconstruction Engineer and Project Manager.

References

Price + Time Bidding (P+T)

Form F1 - Milestone Review Comment Resolution Form

UDOT QC/QA Documentation

Deliverables & Tasks

I. PLAN-IN-HAND MEETING AGENDA

A. Prepare Meeting Agenda

1. Arrange for the location and time of the meeting.
2. Prepare the meeting agenda.

Suggested agenda items:

- Field visit
- Project Definition Document (PDD)
- Action items from previous milestone review meetings
- Comment resolution form
- Project Design Certification (PDC)
- Design exceptions and deviations from standards
- Plan sheet responsibilities
- Design conflicts between disciplines
- Constructability issues
- Project phasing and Maintenance-of-Traffic
- Limitations of operations
- Environmental, ROW, Utility, and PI commitments
- Engineer's Estimate
- Risk Register and Mitigation Strategies
- Innovative contracting opportunities such as lane rental, P+T, and incentive/disincentive
- Project schedule, including milestones and Submit for Advertising Date in Scheduling Software
- ROW strategy
- UDOT QC/QA Documentation
- Finalize VE Study Report

II. PLAN-IN-HAND REVIEW PACKAGE

A. Distribute Review Package

1. Invite all project team members and others as needed.
2. Distribute Plan-in-Hand Review Package (including the completed Geometry Review Comment Resolution Form) and meeting agenda at least two weeks before the Plan-in-Hand Review Meeting.
3. Obtain approval from the Preconstruction Engineer to reduce the review period.

4. See the Preface - Project Coordination section for a listing of required attendees.
5. Distribute review materials to the following if the project includes applicable items:

- Irrigation Company Representative
- Central Traffic & Safety
- Structures
- Central Hydraulics
- Statewide Transit Engineer
- Central Geotechnical
- Central ROW Representative
- FHWA Representative
- Region Land Surveyor
- Fiber Business Manager
- ITS Project Manager
- Consultant Design Team
- CMGC Contractor
- ICE

III. PLAN-IN-HAND MEETING NOTES

A. Hold Meeting

1. Conduct the meeting according to the agenda.

B. Compile Meeting Notes

1. Capture all decisions made and create an action item list.
2. Distribute the meeting notes to all meeting invitees.

IV. PLAN-IN-HAND REVIEW COMMENT RESOLUTION FORM

A. Compile Plan-in-Hand Review Comments and Submit Initial Dispositions and Responses

1. The Design Leader compiles all reviewer comments into one Plan-in-Hand Review Comment Resolution Form.
2. Each discipline provides an initial disposition and response to comments related to their design and deliverables.
 - Refer to UDOT QC/QA Documentation for more information about completing the Form F1 - Milestone Review Comment Resolution Form.
3. The Design Leader submits the Plan-in-Hand Review Comment Resolution Form to all reviewers and team members once all comments have an initial disposition and response.

V. PROJECT DEFINITION DOCUMENT (PDD)

A. Finalize and submit the PDD for Signature, if not already completed.

1. Verify that approved VE recommendations are incorporated in the PDD.

4V1 PLANS, SPECIFICATIONS, & ESTIMATE (PS&E) REVIEW MEETING

Overview

The purpose of this meeting is to ensure that the elements provided in the plan sheets and advertising documents are consistent with the project scope and budget requirements. The meeting should include reviews to determine consistency, accuracy, and constructability.

References

Price + Time Bidding (P+T)

UDOT QC/QA Documentation

Deliverables & Tasks

I. PS&E MEETING AGENDA

A. Prepare Meeting Agenda

1. Arrange for the location and time of the meeting.
2. Prepare the meeting agenda.

Suggested agenda items:

Review Project Definition Document (PDD)

Meeting minutes and action items from previous milestone review meetings

Project Design Certification (PDC)

Design exceptions and deviations from standards

Engineer's Estimate (Use an independent cost estimator if necessary)

Risk Register and Mitigation Strategies

Innovative contracting opportunities such as lane rental, P+T, and incentive/disincentive

ROW progress

Project commitments

Project schedule and Submit for Advertising Date in Scheduling Software

UDOT QC/QA Documentation

II. PS&E REVIEW PACKAGE

A. Distribute Review Package

1. Invite all project team members and others as needed.
2. Distribute PS&E Review Package (including the completed Plan-in-Hand Review Comment Resolution Form) and meeting agenda at least two weeks before the PS&E Review Meeting.
3. Obtain approval from the Preconstruction Engineer to reduce the review period.
4. See the Preface - Project Coordination section for a listing of required attendees.
5. Distribute review materials to the following if the project includes applicable items:

Irrigation Company Representative

Central Traffic & Safety

Structures

Central Hydraulics

Statewide Transit Engineer

Central Geotechnical
Central ROW Representative
Region Land Surveyor
ICE
Fiber Business Manager
ITS Project Manager
Consultant Design Team
CMGC Contractor

III. PS&E MEETING NOTES

A. Hold Meeting

1. Conduct the meeting according to the agenda.

B. Compile Meeting Notes

1. Capture all decisions made and create an action item list. Distribute the meeting notes to all meeting invitees.

IV. PS&E REVIEW COMMENT RESOLUTION FORM

A. Compile PS&E Review Comments and Submit Initial Dispositions and Responses

1. Follow UDOT QC/QA Documentation to compile and provide initial dispositions and responses to all PS&E comments on one comment resolution form.
2. The Design Leader submits the PS&E Review Comment Resolution Form (See 4Y1) to all reviewers and team members once all comments have an initial disposition and response.

5V1 Comment Resolution Review Meeting

Overview

This meeting is to review the final comment resolution form. All comment resolutions are addressed by the respective reviewer at the completion of this activity. There are no plan reviews other than spot checks of proper comment incorporation.

References

UDOT QC/QA Documentation

If Local Government Project

The Local Government Representative schedules and conducts the meeting, provides agendas, keeps meeting minutes, and distributes them after the meeting.

Deliverables & Tasks

I. FINAL COMMENT RESOLUTION FORM

A. Invite Meeting Attendees

1. Determine time and location of the meeting and invite all team members and reviewers.
2. Distribute the Final Comment Resolution Form (See 1Y2) with an invitation to the meeting.
3. It is recommended that the Comment Resolution Meeting be held with adequate time to address comments depending on their complexity.
4. The Comment Resolution Meeting is to be held, at a minimum, one week following the PS&E Review Meeting.

B. Hold Meeting

1. Conduct the meeting as a review of the Final Review Comment Resolution Form.

Any comment response the reviewer does not agree with must be discussed and a final action agreed upon at the meeting.

Reviewers may “spot check” the plans and documents to verify proper implementation.

C. Revise Final Comment Resolution Form (if needed)

1. Revise the Comment Resolution Form based on the decisions made at the Comment Resolution Meeting.

To resolve any remaining comments, see 5Y1 Incorporate PS&E Review Comments.

II. REVISED PLAN SHEETS AND DOCUMENTS (AS NEEDED)

- A. Provide Revised Plan Sheets
- B. Provide Revised Specifications

III. QC/QA DOCUMENTATION

- A. Assure all QC/QA Documentation is Loaded into ProjectWise

6V1 Post Construction Conference

Overview

This meeting serves as a lesson learned opportunity. The Project Manager along with the Resident Engineer (RE) set up the meeting and invite the project team members back to revisit the project and discuss any design issues or other items that may have come up through the construction phase.

References

UDOT Construction MOI

UDOT Project Manager Guide

Deliverables & Tasks

I. LESSONS LEARNED DOCUMENT

A. Invite Meeting Attendees

1. The PM and RE invite members of the project design team along with the construction team (the owner as well as the contractor) to attend this conference.
2. Other interested stakeholders who had important roles on the project could also be invited to attend.

B. Hold Meeting

1. The PM and RE arrange for a location suitable for the expected attendees.
They also arrange for the agenda and notes to be taken during the meeting.
2. This meeting could be combined with a final inspection (especially on smaller projects).

C. Develop Lessons Learned Document

1. All team members are invited to share lessons learned through the design and construction phases of the project.
2. Comments are recorded and sent out to the team for review.
3. Once reviewed, these comments are finalized into a Lessons Learned document which is then distributed and loaded into ProjectWise.

DESIGN LEADER

1Y1 Develop Project Design Certification (PDC)

Overview

Develop the Project Design Certification (PDC).

References

AASHTO Critical Elements

AASHTO, A Policy on Geometric Design of Highways and Streets

UDOT Project Design Certification

UDOT Bus Rapid Transit Design Manual (BRTDM)

UDOT Roadway Design Manual(RDM)

UDOT QC/QA Documentation

Deliverables & Tasks

I. PROJECT DESIGN CERTIFICATION (PDC) FORM

A. Develop Project Design Certification (PDC)

1. Develop the PDC following the instructions provided on the PDC form.
2. Obtain information including design speed, design vehicle, design year, terrain, and Project Traffic Report or review from the Concept Report.
Use this data to complete the PDC for the project.
3. Develop criteria for critical design elements and document design deviations and exceptions from UDOT standards using the PDC form.
4. Initiate the PDC during or before project Scoping phase and complete it preferably before Final Comment Resolution or absolutely before Region Advertisement Review.

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Design Leader QC Checklist before distribution.
Provide the Checker with a check print of each deliverable and supporting documentation.
Complete all necessary corrections from the QC checklist.
Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

III. SIGNED PROJECT DESIGN CERTIFICATION (PDC) FORM

A. Coordinate with Region Preconstruction Engineer for PDC Approval

1. Work with the Pre Construction Engineer to ensure the PDC meets the proper standards and requirements and submit the form to the Region Preconstruction Engineer for approval.
2. Additional approvals are required for specific design allowances, deviations from UDOT standards, and design exceptions.
Additional time will be required for the review and approval of these items

1Y2 Prepare/Compile Scoping Review Package

Overview

Prepare and compile all discipline review materials to produce the Scoping Review Package.

References

UDOT QC/QA Documentation

If Local Government Project

The Local Government Representative is responsible for monitoring the progress of the design activities to ensure that the design process remains on schedule and within budget. Any reduction of project scope or additional funding must be approved by UDOT Project Manager. The Local Government Representative should request frequent status updates from the Design Leader.

Deliverables & Tasks

I. SCOPING REVIEW PACKAGE

A. Compile Initial Total Project Cost Estimate

1. Obtain each discipline's cost estimate and compile them into one document.

B. Prepare Scoping Review Package

1. Compile all review materials from each discipline, including the following:

Discipline summary reports

Initial Project Cost Estimate

Project estimate ePM Screen 505

Initial Preliminary Typical Section

Design Review Drawing

2. Distribute the package to all meeting attendees and reviewers a minimum of one week before the Scoping Meeting (1V2).

II. MAINTENANCE/PRE CONSTRUCTION SITE VISIT CERTIFICATION FORM

A. Schedule Maintenance/Pre Construction Site Visit

1. Contact the District Engineer to determine which Maintenance Station(s) are located in the project area.

2. Contact the Maintenance Station Foreman and schedule the maintenance/pre construction site visit.

If you cannot reach the Maintenance Station Foreman, contact the Project Manager for assistance.

3. It is ideal to schedule the site visit between the Kickoff Meeting and the Scoping Meeting.

If the site visit cannot occur before the Scoping Meeting, schedule the site visit as early as possible, but no later than the Geometry Review Meeting.

4. The following project team members are required to attend the site visit:

Design Leader

Maintenance Station Foreman or Area Supervisor

Public Works Director (if local government project)

5. Invite the following project team members as appropriate:

Design Lead for each discipline

Project Manager

Resident Engineer

Maintenance Analyst

Traffic and Safety

B. Conduct Maintenance/Pre Construction Site Visit

1. The purpose of the site visit is for the Design Leader along with the Maintenance Station Supervisor to assess relevant maintenance issues to the project area, and identify potential items to be included in the project scope.
2. Information to discuss during the meeting includes:
 - Soft spot locations
 - Drainage Issues
 - Culvert Inspections
 - Safety
 - Structures
 - Maintenance Management Quality Assurance (MMQA) grades and concerns
 - Top three issues provided by the maintenance station
 - Any other relevant concerns of the maintenance station
3. Complete the Maintenance/Pre Construction Site Visit Certification Form and obtain necessary signatures.
 - Follow the instructions on the certification form to scan and upload onto ProjectWise the signed certification form and comment resolution form (if used).

III. MAINTENANCE/PRE CONSTRUCTION SITE VISIT COMMENT RESOLUTION FORM

A. Address Maintenance/Pre Construction Site Visit Comments

1. Compile and address all comments and concerns from the site visit into a Milestone Comment Resolution Form (Form F1).
2. Discuss the site visit comments with the Project Manager.
3. Identify the following:
 - Items that already fit within the proposed project scope.
 - Items that cannot be addressed by the project.
 - Items that warrant further discussion and potential scope alterations.
4. Assist the Project Manager in addressing potential scope alterations.
5. Complete the comment resolution form, if being used.
6. Discuss with the maintenance station foreman the maintenance items that will be included in the project, as needed.

IV. PROJECT DEFINITION DOCUMENT (PDD)

A. Compile Project Definition Document (PDD)

1. Complete the Project Definition Document (PDD) using the following information:
 - Brief Objective Statement
 - High level project goals and metrics to determine success
 - Project scope to support the goals
 - Project delivery method
 - Major risks
 - Budget estimates from ePM Screen 505
 - Proposed Advertisement Date and Anticipated Construction Completion

V. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Design Leader QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

2Y1 Prepare/Compile Geometry Review Package

Overview

Compile project cost estimate and all discipline deliverables into one Geometry Review Package.

References

GIS Conversion Tool

UDOT Digital Delivery CADD Standards Validation Tool Guide

UDOT Project Design Certification

UDOT QC/QA Documentation

If Digital Delivery Project

Designers may convert design data to GIS when it is requested by the region or project team. A designer will use the GIS Conversion Tool to convert the design data to the GIS format necessary for use by the requesting entity. Designers should validate the design data prior to converting it to GIS using the CADD Standards Validation Tool.

Deliverables & Tasks

I. GEOMETRY REVIEW PACKAGE

A. Compile Project Cost Estimate

1. Obtain each discipline's cost estimate and compile them into one document.

B. Review PDC

1. Review the PDC based on comments from the scoping review.
2. Determine the need for a Value Engineering (VE) Study, see 2Z1 for guidance.

C. Prepare Geometry Review Package

1. Compile all review materials from each discipline into one review package.
 - Project Cost Estimate
 - Review Drawings, model, or map(in approved formats)
 - Other discipline review materials
 - Submit Maintenance/Pre Construction Site Visit Certification Form, if complete and not submitted with the Scoping Review Package. (See 1Y2)
2. Distribute the review package to all meeting attendees and reviewers a minimum of one week before the Geometry Review Meeting (2V1).

II. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Design Leader QC Checklist before distribution.
 - Provide the Checker with a check print of each deliverable and supporting documentation.
 - Complete all necessary corrections from the QC checklist.
 - Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

B. Produce a CADD Validation Standards Report using the UDOT CADD Standards Validation Tool.

1. Follow the UDOT Digital Delivery CADD Standards Validation Tool Guide to produce a CADD Validation Standards Report.

2. Review Report and complete all necessary corrections to the design files that fail in the report.
3. Upload passed report into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

3Y1 Prepare/Compile Plan-in-Hand Review Package

Overview

Compile Geometry Review comment resolution form, project cost estimate, and all discipline deliverables into one Plan-in-Hand review package.

References

GIS Conversion Tool

UDOT Digital Delivery CADD Standards Validation Tool Guide

Price + Time Bidding (P+T)

UDOT Project Design Certification

UDOT QC/QA Documentation

If Digital Delivery Project

Designers may convert design data to GIS when it is requested by the region or project team. A designer will use the GIS Conversion Tool to convert the design data to the GIS format necessary for use by the requesting entity. Designers should validate the design data prior to converting it to GIS using the CADD Standards Validation Tool.

If Local Government Project

The Local Government Representative is responsible for monitoring the progress of the design activities to ensure that the design process remains on schedule and within budget. Any reduction of project scope or additional funding must be approved by UDOT Project Manager. The Local Government Representative should request frequent status updates from the Design Leader.

Deliverables & Tasks

I. GEOMETRY REVIEW COMMENT RESOLUTION FORM

A. Finalize Geometry Review Comment Resolution Form

1. Coordinate with team members to address and verify all Geometry Review comments.

Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

II. USER COSTS (FOR PRICE + TIME BIDDING)

A. Determine Traffic Control Restrictions

1. Coordinate with the project team to determine the following:

Construction phasing

Schedule

Phasing limits

Unique traffic control or maintenance of traffic issues

Preliminary MOT design

Construction limitations

B. Coordinate User Cost Analysis with the TMD

1. Coordinate with the Traffic Management Division (TMD) to determine the user costs.

C. Finalize User Costs

1. Coordinate, as necessary, with the project team to adjust traffic control, maintenance of traffic, and construction restrictions and methods to reduce user costs and construction related delays.

2. Determine the final estimated user costs.

III. PLAN-IN-HAND REVIEW PACKAGE

A. Review PDC

1. Review and update the PDC based on comments from the geometry review.

B. Update Project Cost Estimate

1. Obtain each discipline's cost estimate and compile them into one document.

C. Prepare Plan-in-Hand Review Package

1. Prepare Plan-in-Hand Review Package:

Geometry Review Comment Resolution Form

All Preliminary Plan Sheets or 60% model data

Typical Sections

Project Cost Estimate

Project estimate ePM Screen 505

2. Distribute the package to all meeting attendees and reviewers a minimum of two weeks before the Plan-in-Hand Meeting (3V1).

IV. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Design Leader QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

B. Produce a CADD Validation Standards Report using the UDOT CADD Standards Validation Tool

1. Follow the UDOT Digital Delivery CADD Standards Validation Tool Guide to produce a CADD Validation Standards Report.

2. Review Report and complete all necessary corrections to the design files that fail in the report.

3. Upload passed report into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

4Y1 Prepare/Compile PS&E Review Package

Overview

Compile Plan-in-Hand comment resolution form, project cost estimate, and all discipline deliverables into one PS&E review package.

References

GIS Conversion Tool
UDOT Digital Delivery CADD Standards Validation Tool Guide
UDOT CADD Standards
UDOT Plan Sheet Development Standards
UDOT Digital Delivery Website
UDOT Specification Writer's Guide
Masterworks
UDOT QC/QA Documentation

If Digital Delivery Project

Designers may convert design data to GIS when it is requested by the region or project team. A designer will use the GIS Conversion Tool to convert the design data to the GIS format necessary for use by the requesting entity. Designers should validate the design data prior to converting it to GIS using the CADD Standards Validation Tool.

If Local Government Project

The Local Government Representative is responsible for monitoring the progress of the design activities to ensure that the design process remains on schedule and within budget. Any reduction of project scope or additional funding must be approved by UDOT Project Manager. The Local Government Representative should request frequent status updates from the Design Project Manager.

Deliverables & Tasks

I. PLAN-IN-HAND REVIEW COMMENT RESOLUTION FORM

A. Finalize Plan-in-Hand Review Comment Resolution Form

1. Coordinate with team members to address and verify all Plan-in-Hand review comments.
2. Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.

II. PS&E REVIEW PACKAGE

A. Update Project Cost Estimate

1. Obtain each discipline's cost estimate and compile them into one document.
2. Verify all disciplines have entered their final estimates into Masterworks correctly.
3. Assist the discipline leads as needed.

B. Prepare PS&E Review Package

1. Compile all discipline documents for review including plan sheets, special provisions, and M&P.
2. Prepare the PS&E review package including:
 - Plan-in-Hand Review Comment Resolution Form
 - Complete plan set (Plan Set Sheets or 90% model data)
 - All special provisions, specifications

Use UDOT Specification Writer's Guide
Project Cost Estimate
M&P, A&D, and other project documents
Project estimate ePM Screen 505
Draft SWPPP Package for Construction
Draft Final Structure Acceptance
Draft Right-of-Way Certification
Draft Traffic and Safety Certification
Draft Utility Certification
Environmental Permits (if available)

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Design Leader QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

B. Produce a CADD Validation Standards Report using the UDOT CADD Standards Validation Tool

1. Follow the UDOT Digital Delivery CADD Standards Validation Tool Guide to produce a CADD Validation Standards Report.
2. Review Report and complete all necessary corrections to the design files that fail in the report.
3. Upload passed report into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

5Y1 Incorporate PS&E Review Comments

Overview

Make revisions based on comments made during PS&E Review (4V1).

References

GIS Conversion Tool

UDOT Digital Delivery CADD Standards Validation Tool Guide

UDOT Digital Delivery Website

UDOT CADD Standards

UDOT Plan Sheet Development Standards

UDOT QC/QA Documentation

If Digital Delivery Project

Designers will convert design data to GIS in preparation for advertisement and construction. A designer will use the GIS Conversion Tool to convert the design data to the GIS format necessary for use in GIS field tools. Designers should validate the design data prior to converting it to GIS using the CADD Standards Validation Tool.

If Local Government Project

The Local Government Representative is responsible for monitoring the progress of the design activities to ensure that the design process remains on schedule and within budget. Any reduction of project scope or additional funding must be approved by UDOT Project Manager. The Local Government Representative should request frequent status updates from the Design Project Manager.

Deliverables & Tasks

I. FINAL COMMENT RESOLUTION FORM

A. Address and Incorporate PS&E Review Comments

1. Each discipline responds to their PS&E comments, revises their designs and deliverables as needed based on the comment responses, and finalizes their plans and project documents.
2. Verify each comment after implementation and QC review.
3. Refer to UDOT QC/QA Documentation for more information about completing a Milestone Review Comment Resolution Form.
4. The Design Leader confirms all comment responses are verified and prepares for the Comment Resolution Review Meeting.

Refer to 5V1 Comment Resolution Review Meeting for more information.

II. FINAL PROJECT COST ESTIMATE

A. Revise Project Cost Estimate

1. The Design Leader coordinates with each discipline to finalize the project cost estimate.

III. QC DOCUMENTATION

A. Perform QC Review

1. Perform the QC Review following the UDOT QC/QA Procedures and the Design Leader QC Checklist before distribution.

Provide the Checker with a check print of each deliverable and supporting documentation.

Complete all necessary corrections from the QC checklist.

Upload all QC documentation into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

B. Produce a CADD Validation Standards Report using the UDOT CADD Standards Validation Tool

1. Follow the UDOT Digital Delivery CADD Standards Validation Tool Guide to produce a CADD Validation Standards Report.
2. Review Report and complete all necessary corrections to the design files that fail in the report.
3. Upload passed report into ProjectWise and attribute it correctly before or at the distribution of the milestone review package.

IV. FINAL PLAN SET AND PROJECT DOCUMENTS

A. Revise Plans and Project Documents (if needed)

1. Each comment's resolution is verified by the reviewers during the Comment Resolution Meeting.
2. Any comments that are deemed inadequately resolved must be addressed before advertising.
3. The Design Leader coordinates with project team members and reviewers to address any remaining comments and revise the final deliverables based on the decisions made during the Comment Resolution Meeting.
4. Perform QC procedures for all revisions and final verification of comment resolution.

B. Compile Advertising Plans and Project Documents

1. Coordinate with project team members to finalize and compile the advertising plans and project documents.
2. Submit Advertising Plans and Project Documents to the Preconstruction Engineer and Region PM Specialist for review and approval.
3. Include the following:

Final Review Comment Resolution Form

Complete plan set

All special provisions, and specifications

Final Project Cost Estimate

M&P, A&D, and other project documents

Accepted Structural Documentation Package (if applicable)

Project estimate ePM Screen 505

All other relevant discipline specific and required documents.

PROJECT MANAGEMENT

1Z1 Project Oversight

Overview

This activity is for the Project Manager oversight of the project through the entire design phase and into post advertising. This activity is used to manage all of the aspects of the project, including scope, schedule and budget.

References

Project Financial Management Guide

Team UDOT Guide

UDOT Project Manager Guide

Consultant Services Manual of Instruction

Deliverables & Tasks

I. PROJECT OVERSIGHT

- A. Read, Understand, and Become Familiar with the UDOT Project Manager Guide
 - 1. This will help experienced and new PMs understand PM processes and expectations.
 - 2. It will acquaint PMs with their roles and responsibilities along with the skills and knowledge required to deliver a successful project.
- B. Read, Understand, and Become familiar with the Team UDOT Guide
 - 1. This brings together team building tools, tips, strategies and steps to help improve project success by:
 - Improving Project Delivery
 - Enhancing communication and collaboration
 - Reaching milestones on time and under budget
 - Generating innovative ideas and solutions

II. PROJECT SCOPE

- A. Project Setup and then Continue following this Guideline to Aid in the Delivery of a Successful Project
 - 1. See activity 1Z2

III. PROJECT SCHEDULE

- A. Update/Review Schedule in UDOT Scheduling Software
 - 1. Discipline Leads are responsible to update the schedule in UDOT scheduling software for their activities.
 - 2. This task is to review updates and project status in the scheduling software.
 - 3. The PM is responsible for making sure the project is on schedule, within allocated resources (budget and staff), and within scope.
 - 4. Coordinate with Discipline Leads to address projected needs that will exceed the schedule, resources, and scope.

IV. PROJECT BUDGET

- A. Read, Understand, and Become Familiar with Project Financial Management Guide
 - 1. The goal for this guide is to provide an overview of the Project Finance Life Cycle and to give tools to minimize the project's financial risk and make best use of the budget.

2. The Project Financial Life Cycle serves as budget milestones and checkpoint opportunities to validate projected cost estimates, account for actual expenditures, confirm project phase budgets, and ensure budget risk cost controls are in place.

3. The Project Financial Management Guide includes the following chapters which describe how a project is initiated (well before the PDN process is started on a project), to how a project is closed out, including:

- Introduction

- Basic Project Accounting

- Project PIN Creation Process

- Concept Development (CD) Process

- Preconstruction Process

- Advertise Construction Process

B. Develop and Monitor the Budget with Coordination and Input from the Discipline Leads

C. Actively Track, Monitor, Refine, Update the Project Budget

D. Manage Contracts and Contract Modifications

- 1. Set up contracts with consultants when needed to deliver the scope of the project. (See Activity 1Z3 for further guidance)

- 2. Request contract modifications when they are justified.

- 3. Review all consultant invoices to see that they are consistent with the contract documents and then submit for payment.

 - Invoices should be reviewed and approved or rejected within 30 days of submittal.

1Z2 Project Setup

Overview

Become familiarized with how the project came to be. This is the initiation of the Preconstruction Phase of the project.

References

Project Definition Document Website
ePM Contract Management System (CMS)
Environmental Document (if previously completed)
Project Concept Report (if available)
Project Financial Management Guide
Team UDOT Guide
UDOT Project Manager Guide
Consultant Services Manual of Instruction

Deliverables & Tasks

I. DRAFT PROJECT DEFINITION DOCUMENT (PDD)

- A. Obtain Project Information
 - 1. The Project Manager reviews all information on the project and becomes familiar with it.
 - 2. The project information could include:
 - Planning/Corridor Studies
 - Concept Report
 - Concept Estimate
 - Environmental Documents
 - Project Application from the Municipal Planning Organization (MPO)
- B. Develop Draft Project Definition Document
 - 1. This Document is found on the Project Definition Document Website.
 - 2. The PDD may be reviewed with the project team, whether formally (at a milestone meeting), or informally with individual relevant disciplines.

II. PROJECT SET-UP

- A. Ensure That Project Is in a Funded Year
 - 1. Review the ePM screen 710 to confirm that the project has PE funding in the current fiscal year; otherwise work with the Region's Program Manager.
- B. Check/Update Cashflow
 - 1. Populate the dates in the "Cash Flow" sub-tab in the ePM 505 screen.
- C. Request Federal Aid Agreement (FAA) in CMS, when project is considered an LG Project (this term is defined in the Preface)
 - 1. Reference the Consultant Services Manual of Instruction.
- D. Obligate Currently Needed Funds
 - 1. Update the ePM 505 screen to reflect the estimated funding required for:
 - PE phase (including in-house and consultant work effort)
 - Environmental phase (including in-house and consultant work effort)
 - 2. Email Program Finance (programfinance@utah.gov) to request the appropriate phase to be made active.
- E. Identify Project Team
 - 1. Coordinates with the Region Staff and Program Manager to determine if all or parts of the preconstruction services will be kept internal to UDOT.

2. If it is determined that a consultant is needed. (Refer to task 1Z3)

F. Identify Design Team

1. Determine project staffing needs based on the type and characteristics of the project:

Technical needs of the project

Technical capabilities within the department

PI needs for the project

Availability of resources

Time limitations

2. Identify oversight team

Identify specific staff to include on the project team if determined there is a need for in-house staff.

G. Set Up Preliminary Schedule in UDOT's Scheduling Software

1. Go to the UDOT Project Manager Office (PMO) webpage.

2. Under the Projects subsection of the Project Manager section in the Main Screen, click "Get Started" OR click on Project Manager in the left sidebar, and then Projects. (Both of these links take you to the same landing page.)

Initiate the schedule to be created by selecting the "All" drop down option "Project Status" field.

Scroll down to your PIN and click the "Link to MS Project" hyperlink in the ACTION column.

Follow the instructions on the screen.

3. Populate the schedule with tasks appropriate to the scope of the project and coordinate with Discipline Leads when unsure if tasks are needed for the project.

4. Coordinate with Discipline Leads to provide recommendations for their respective activity durations.

1Z3 Obtain Consultants

Overview

Based on availability and on the complexity of a project, consultants may be needed to complete the entire design or complete specific portions of the project. For example; environmental services, ROW design services, ROW acquisition services, public involvement services, Value Engineering, Construction Engineering Management (CEM) services, etc.

Good Practice Tip

This activity can be duplicated in the schedule for when more than one consultant contract is needed on a project.

References

Consultant Services Website
Consultant Services Manual of Instruction
ePM Contract Management System (CMS)
ePM application
RFQ Solicitation Checklist and Request Template

Deliverables & Tasks

I. CONSULTANT CONTRACT(S)

A. Determine Consultant Selection Method

1. Read, understand and become familiar with the Consultant Services Manual of Instruction and Consultant Services Website to identify the process the Project Manager is responsible to follow based on the applicable selection method.

Coordinate with Consultant Services

1. Submit a contract request in CMS.
2. Coordinate with Consultant Services throughout the selection process.

1Z4 Risk Review

Overview

This activity is to be used to conduct the appropriate risk analysis tool for the project.

References

Risk Management Tools Website
Instructions Qualitative Risk Worksheet
Qualitative Risk Worksheet
UDOT Risk Model for Monte Carlo Analysis

Deliverables & Tasks

I. RISK REGISTER

A. Identify Appropriate Risk Analysis Tool

1. Using the tool identified in the Project Management Decision Tree (found in these Instructions), which varies from a risk worksheet to a rigorous risk workshop.

B. Develop Risk Register

1. Develop a comprehensive risk register, using one of the following methods:
Qualitative Risk Worksheet
CRA or CRAVE method
CEVP method
2. If the level of risk identified during the Scoping Meeting (1V2) meets the criteria for a Value Engineering (VE) Study, see 2Z1 for guidance.

II. MITIGATION STRATEGIES

A. Develop Mitigation Strategies

1. Identify mitigation strategies to minimize and/or eliminate risks from the risk register.
2. Incorporate into the project documents as appropriate.
3. Retire risks that have been eliminated.

B. Update Risk Register

1. Continually review the selected risk analysis tool at each milestone meeting.

2Z1 Value Engineering (VE) Study

Overview

Value Engineering (VE) is required on federally-funded bridge projects on the National Highway System (NHS) (over \$40 million) and roadway on the NHS (over \$50 million) projects; additionally a VE is required on any federally-funded project on or off the NHS that is estimated at \$500 million or more. VE is the systematic application of recognized techniques to achieve the following:

Identification of unnecessary project costs

Identification of VE alternatives that provide necessary functions consistent with quality, reliability, life-cycle cost, and other critical factors required by the project.

Project quality and functions are improved while lowering the cost and using fewer resources.

This activity is to identify the need for a VE study, obtain a VE consultant, and conduct the VE study.

References

Consultant Services Website

FHWA Value Engineering website

Life Cycle Cost Information and Guide

Roadway Design Manual

Deliverables & Tasks

I. EXECUTED VE CONSULTANT CONTRACT

A. Identify the Need for a VE Study

1. The Federal requirements for value engineering are in 23 CFR part 627.
2. They are summarized on the FHWA Value Engineering website.
3. These thresholds are minimums and it may be advantageous to conduct a VE study on a project that doesn't meet these thresholds, but is not required.

B. Select a VE Consultant

1. Reference 1Z3 for instruction on selecting a consultant.
2. Engage a VE consultant.
3. Refer to the Consultant Services Website for contracting information.

II. VE STUDY REPORT

A. Assemble All Project Information

1. Plans/Design:
 - As-Constructed
 - Preliminary
 - Horizontal Alignment
 - Vertical Alignment
 - Typical Sections
 - ROW
 - Utilities
2. Detailed Engineer's Estimate
3. Topography and Contour Maps (Aerials)
4. PDC
5. Environmental Resources
6. Pavement Design Data
7. Structures Information
 - As-Constructed Plans

Sufficiency Ratings

8. Drainage Data

B. Conduct VE Study

1. The VE team conducts the VE study.
2. Refer to the UDOT Value Engineering Manual of Instruction for more information.
3. The following people are required for the VE presentation:
 - UDOT Upper Management
 - Project Manager
 - Design Team
 - Functional Managers
 - Structures
 - Hydraulics
 - ROW
 - Traffic and Safety
 - Construction Engineering Management and/or Constructability

C. Prepare VE Study Report

1. Compile and document the results of the VE study into a report.
2. Include an implementation plan for the study results.

D. VE Recommendation Acceptance

1. Review VE recommendations
2. Identify VE recommendations to carry forward
3. Develop the justification for VE recommendations that are rejected or modified

E. Incorporate VE Recommendations

1. Incorporate the recommendations into the appropriate phase of the project.

3Z1 Develop Draft Transportation Management Plan (TMP)

Overview

Develop a draft Transportation Management Plan (TMP) to coordinate traffic control, public outreach, and Maintenance of Traffic (MOT) with adjacent projects.

References

Temporary Noise Permit Guide
Net Benefit Analysis Form
Public Outreach Planner (POP) Guide
UDOT Policies
Transportation Management Plan Guideline

Deliverables & Tasks

I. DRAFT TRANSPORTATION MANAGEMENT PLAN (TMP)

A. Identify the Need for a Transportation Management Plan (TMP)

1. Refer to UDOT Policy 08-05 for guidelines defining the TMP.
2. Assemble Traffic Planning Team - suggested attendees include:
 - Region Traffic Engineer
 - Region Communications Manager
 - Design Leader
 - Traffic Management Division Representative as needed
 - Local Jurisdictional Authority Representative(s)
 - Project Public Involvement Lead
 - Constructability and/or CEM Lead
 - Region Preconstruction Engineer
3. Analyze Potential Project Impacts

B. Develop Draft Transportation Management Plan (TMP)

1. Identify adjacent projects
 - Identify potential conflicts
 - Recommend schedule changes if necessary to avoid conflicts
2. Identify Public Involvement requirements
 - Front Row Receptors as defined by SB-177 are required to be notified 48 hours in advance of nighttime construction.
 - Follow the Public Outreach Planner (POP) Guide
3. Identify alternate routes and traffic impacts
4. Prepare an estimated costs and schedule to implement the TMP
5. Recommended coordination with adjacent projects including local governments or jurisdictions.

C. Identify Preliminary Limitation of Operations

1. Coordinate with the Traffic Management Division (TMD) as needed.

D. Identify The Need for Temporary Noise Permit(s)

1. All projects with nighttime construction are required to secure temporary noise permits from local jurisdictional authority(s) if such permits are required, prior to project advertisement.

E. Initiate Temporary Noise Permitting Process (If Required)

1. Refer to the Temporary Noise Permit Guide and Net Benefit Analysis Form for additional information.

F. Identify The Need for Nighttime Highway Construction Net Benefit Analysis

1. All projects with nighttime construction on a route with a posted speed limit below 55 mph are required to complete a net benefit analysis.

G. Develop Draft Nighttime Construction Net Benefit Analysis (If Required)

1. The benefit analysis is used to determine if nighttime construction work provides a net benefit to the community.
2. Refer to the Temporary Noise Permit Guide and Net Benefit Analysis Form for additional information.

3Z2 Hold Right-of-Way Strategy Meeting

Overview

The purpose of this meeting is to develop a strategy to optimize the ROW design and acquisition schedule and minimize project costs. Develop a strategy to mitigate the critical parcels and to acquire all ROW.

References

UDOT Right-of-Way Division Website

Deliverables & Tasks

I. ROW ACQUISITION STRATEGY

A. Set Up Meeting

1. Arrange for the location and time of the meeting.
2. Prepare the meeting agenda.
3. Meeting Attendees could include, but are not limited to, the following:
 - Project Manager
 - Region ROW
 - Central ROW
 - Lead ROW Agent
 - Environmental Manager
 - Roadway Designer
 - Design Leader
 - Resident Engineer
 - Region Communications Manager
 - Utility Leader
 - ROW Designer
 - Statewide Transit Engineer

B. Conduct Field Review of the Project

1. The project team should conduct a physical or virtual drive-thru of the project
2. Each ownership within the project limits should be photographed

C. Develop Initial ROW Requirements

1. Identify funding sources (federal versus state)
2. Estimate the number of ownerships for various project alternatives
3. Estimate the total acquisitions versus partial acquisitions

D. Identify Parcels to Avoid

1. Identify high price parcels or with a high potential to delay the project schedule.
2. Brainstorm design alternatives that may avoid these parcels.
3. Things to consider:
 - Can a straight ROW setback be used on this project?
 - Can the ROW be widened to one side or the other?

E. Develop Initial Acquisition Schedule

1. Prioritize the order of acquisition (which deals take longest)
2. Coordinate the time frame with Lead ROW Agent.

3Z3 Constructability Review

Overview

This activity is to be used to conduct a constructability review of the project.

References

Constructability Review Guidelines

Deliverables & Tasks

I. CONSTRUCTABILITY REVIEW COMMENT FORM

A. Perform Constructability Review

1. Review the proposed project plans to ensure that it is constructible.
2. The purpose of the review is to identify and eliminate potential obstacles to construction that could lead to errors, delays, and/or overruns.
3. Key areas of the review should include, but are not limited to the following:
 - Construction Phasing
 - Staging Areas
 - Location and Placement of Equipment
 - Temporary Shoring
 - Traffic Control Requirements
 - Availability of Resources
 - Methods of Construction
 - Integration of all Disciplines
 - Discussion of Partnering Facilitation

4Z1 Finalize Transportation Management Plan (TMP)

Overview

Finalize the Transportation Management Plan (TMP) based on information provided throughout the design process. This involves input from Program Manager, Public Involvement Manager, and adjacent projects to provide direction for finalizing the project's traffic control plan, Maintenance of Traffic plan, and PI strategies. This does not include the execution or conclusion-report phases of the TMP as defined by UDOT Policy 08-05.

References

Temporary Noise Permit Guide

Net Benefit Analysis Form

Senate Bill 177

TMP Guidelines

Deliverables & Tasks

I. COMPLETED 00555 PROSECUTION AND PROGRESS SECTION 1.11 LIMITATION OF OPERATIONS

A. Finalize Limitation of Operations

1. Coordinate with traffic planning team
2. Coordinate with Design Lead to incorporate Limitation of Operations in 00555 specification

B. Finalize Temporary Noise Net Benefit Analysis (If Applicable)

1. Required on projects with nighttime construction and speed limits under 55 MPH.

C. Obtain Temporary Noise Permit(s) (If Applicable)

1. All projects with nighttime construction are required to secure nighttime construction noise permits from local jurisdictional authority(s), if such permits are required, prior to project advertisement.

II. TRANSPORTATION MANAGEMENT PLAN (TMP)

A. Update and Finalize TMP

1. Incorporate results of Revise/Implement Public Involvement Plan (4P1) and Finalize Traffic Operations & Safety Analyses (3T1) into the final TMP.
2. Create an executive summary of the TMP and include the PI Plan, Maintenance-of-Traffic Plan, and Limitations of Operations.

B. Disseminate Design TMP to Traffic Planning Team Members

1. Review TMP with the Resident Engineer, Traffic and Safety Engineer, Program Manager and other applicable parties.
2. Send for approval based on TMP Guidelines.

5Z1 Assemble Advertising Package

Overview

Assemble and prepare advertising documents for Region Review (5Z2).

Milestone for the completion of this task is called “MS 5 - Submit for Region Review (S2R)”

References

UDOT Advertising Checklist Instructions

ProjectWise Advertising Naming Convention

Masterworks

Deliverables & Tasks

I. UDOT ADVERTISING CHECKLIST AND REQUIRED DOCUMENTS

A. Obtain and Complete Advertising Checklist

1. Download the appropriate advertising checklist and instructions from UDOT’s website.
2. UDOT Advertising Checklist Complete all applicable items in the checklist.
3. Follow the ProjectWise Advertising Naming Convention to properly attribute all files for advertising.

B. Submit a “No ROW” Certification Request

1. If no ROW was acquired on the project, then coordinate with the Region ROW Engineer for a “No Right-of-Way” Certification.

C. Good Practice Tip

1. Indicate with an initial or N/A on all of the items in the “Region/Designer” column for each checklist item.
2. In the final submittal to Central for the advertisement review, the Region PM Tech will be the one who officially initials this form.

II. ENGINEER’S ESTIMATE IN MASTERWORKS

A. Advance the engineer’s estimate in MasterWorks to Region PM Tech

III. EMAIL REGION PRECONSTRUCTION ENGINEER AND REGION PM TECH WITH THE PW LINKS FOR THE DOCUMENTS THAT NEED TO BE REVIEWED TO ADVERTISE THE PROJECT.

A. Good Practice Tip

1. Use the “Marked for Advertisement” search in the PIN folder in ProjectWise you are working in, to ensure all of the correct files are showing for the next reviewers.

5Z2 Region Review of Advertising Package

Overview

Review prepared advertising package in preparation for Program Finance and Central Advertising's review. See below for a graphical representation of the advertising timeline with applicable activities and milestones.

Good Practice Tip

Minimum amount of review time to plan for:

S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16*	17*	18*	19*	20*	21
22	23*	24*	25	26	27	28
29	30	31	1	2	3	4
* Some of the Region Review items unrelated to what is needed for Program Finance Review can be done concurrently with the Program Finance for Obligation.						

LEGEND	
Activity	Milestone
	MS5 S2R (Submit to Region)
5Z2 Region Review of Advertising Package	MS6 SPFR (Submit for Program Finance Review)
5Z3 Program Finance Review for Obligation	
5Z4 Region Submittal to Central Advertising	MS7 SAR (Submit for Advertising Review) Date
5Z5 Central Advertising Review of Advertising Package	MS8 ADVERTISE (Post to Website & Papers) Date

References

UDOT Advertising Checklist Instructions

Deliverables & Tasks

I. REVIEWED FILES REQUIRED TO ADVERTISE THE PROJECT

- Review for Accuracy All Assigned Tasks on the UDOT Advertising Checklist
- Other Factors Affecting Review Time and Prioritization of Reviews

1. CAD date of projects sitting in the Region's review queue
 2. Start date of construction
 3. End date of construction
 4. Other special circumstances
- C. PM Tech Reviews Bid Opening Date with "Estimate Support", Who Coordinates with Project Manager if the Bid Opening Date Needs to Change

II. SIGNED UDOT ADVERTISING CHECKLIST

- A. Reviews and Advances Estimate in "MasterWorks - Estimating" Module to Central Advertising Once Funding approval is Received from Program Finance

III. SIGNED PLAN SET, WHEN APPLICABLE

5Z3 Program Finance Review for Obligation

Overview

Review project for obligation of all of the project funds.

Milestone for the completion of this task is called “MS7 - Program Finance Obligation (PFO)”

Good Practice Tip

Minimum amount of review time to plan for:

S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16*	17*	18*	19*	20*	21
22	23*	24*	25	26	27	28
29	30	31	1	2	3	4
* Some of the Region Review items unrelated to what is needed for Program Finance Review can be done concurrently with the Program Finance for Obligation.						

LEGEND	
Activity	Milestone
	MS5 S2R (Submit to Region)
5Z2 Region Review of Advertising Package	MS6 SPFR (Submit for Program Finance Review)
5Z3 Program Finance Review for Obligation	
5Z4 Region Submittal to Central Advertising	MS7 SAR (Submit for Advertising Review) Date
5Z5 Central Advertising Review of Advertising Package	MS8 ADVERTISE (Post to Website & Papers) Date

References

Deliverables & Tasks

I. COMPLETE PROGRAM FINANCE CHECKLIST

II. ESTIMATE REVIEW

A. Compares engineer's estimate to the ePM 505 and 495 screens, as well as reviewing all cost to date and encumbrances.

III. T-725

A. Fill Form Out and Request Approval.

IV. R-709

A. Fill Out Form and Request Approval.

B. Submit Form to FHWA via FMIS for Funding Approval

V. FINET PHASE FORM

A. Complete Form Upon Approval and Send to Project Accounting for FINET Phase Activation.

VI. WHEN ALL NECESSARY APPROVALS HAVE BEEN OBTAINED, NOTIFY PROJECT TEAM THAT FUNDING HAS BEEN APPROVED.

5Z4 Region Submittal to Central Advertising

Overview

Review and process advertising package for creating of bid documents to post on UDOT's website.

Good Practice Tip

Minimum amount of review time to plan for:

S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16*	17*	18*	19*	20*	21
22	23*	24*	25	26	27	28
29	30	31	1	2	3	4

* Some of the Region Review items unrelated to what is needed for Program Finance Review can be done concurrently with the Program Finance for Obligation.

LEGEND	
Activity	Milestone
	MS5 S2R (Submit to Region)
5Z2 Region Review of Advertising Package	MS6 SPFR (Submit for Program Finance Review)
5Z3 Program Finance Review for Obligation	
5Z4 Region Submittal to Central Advertising	MS7 SAR (Submit for Advertising Review) Date
5Z5 Central Advertising Review of Advertising Package	MS8 ADVERTISE (Post to Website & Papers) Date

References

Masterworks

Deliverables & Tasks

I. Inform Central Advertising that the bid documents are ready for their review for advertisement.

A. Forward the Engineer's Estimate in MasterWorks to Central Advertising

5Z5 Central Advertising Review of Advertising Package

Overview

Review and process advertising package for creating of bid documents to post on UDOT's website.

Good Practice Tip

Minimum amount of review time to plan for:

S	M	T	W	TH	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16*	17*	18*	19*	20*	21
22	23*	24*	25	26	27	28
29	30	31	1	2	3	4

* Some of the Region Review items unrelated to what is needed for Program Finance Review can be done concurrently with the Program Finance for Obligation.

LEGEND	
Activity	Milestone
	MS5 S2R (Submit to Region)
5Z2 Region Review of Advertising Package	MS6 SPFR (Submit for Program Finance Review)
5Z3 Program Finance Review for Obligation	
5Z4 Region Submittal to Central Advertising	MS7 SAR (Submit for Advertising Review) Date
5Z5 Central Advertising Review of Advertising Package	MS8 ADVERTISE (Post to Website & Papers) Date

***FHWA requires a minimum of 3 weeks (21 calendar days) before a project can be opened. Shorter periods may be approved in special cases when justified.

References

Masterworks
Utah Legals

Deliverables & Tasks

I. BID DOCUMENTS ON UDOT WEBSITE

- A. Complete Central Advertising's advertising checklist
 - 1. Review Advertising Package
 - 2. Notify Region of any issues that need to be corrected
 - 3. Load project into the Masterworks - Construction module so the contractors can enter their bids.
- B. Create bid documents for posting to website
 - 1. Add wage rate into to file labeled to complete the "PIN_Adv Set"
 - 2. Create bid items
 - 3. Create notice for contractors
- C. Publish Notice to Contractors in Newspaper
 - 1. Publish project to utahlegals.com with a link to the UDOT bid letting site Project Explorer.

5Z6 Process Addenda (if necessary)

Overview

Process to update the bid documents of an advertised project on UDOT's website.

Note - this activity is not tracked in UDOT's scheduling software.

References

Addendum Manual of Instruction

Addendum Wizard

Description

If any of the bid documents posted on UDOT's website need to be altered, create an addendum.

5Z7 Award Project

Overview

Review bid and recommend for award. Notify the winning contractor of award.

References

Masterworks

Description

Bid reviewer opens bids at 2pm on a specified date, referred to as the "Bid Opening Date.

Unofficial bid results are posted by the bid reviewer.

PM is notified of bid abstract availability.

PM approves abstract based on review of validating non collusive and unbalanced bid items.

Contracts Specialist reviews approval information.

PM provides email concurrence to Contracts Specialist, to award bid.

Contracts Specialist prepares legal contract and notice of award to be distributed to the awarded contractor.

Awarded contractor is to provide a fully signed contract and bonds including proper insurance within 15 days of award.

Contract Specialist receives fully signed contract and proper insurance prior to generating notice to proceed.