Oregon Department of Transportation

Bridge CAD Manual

Delivery & Operations Division | Bridge Engineering Section

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Oregon Department of Transportation

Engineering and Technical Services Branch

Bridge Engineering Section, MS#4

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https://www.oregon.gov/odot/Bridge/Pages/Bridge-Design-Manual.aspx

Acknowledgement

This document is the work product of the Bridge Program and Standards Unit of the Bridge Engineering Section. The Section is the technical owner of the content, while the Unit has the stewardship responsibility to keep the content up-to-date and communicate changes to the users of this manual.

Suggested modifications to this document can be made to the Senior CAD Standards Specialist in the Bridge Section, Program and Standards Unit.

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Revisions

Revision	Date	Part	Section	Description
	9/12/2022	All	All	Update contents and format – draft version
	5/3/2023	100	101	Clarified criteria for which walls are included in the J series; direction to abbreviations and acronyms in the OCM; updated hyperlinks
		200		Edited heading
			203	Added CAD plans review; updated flow chart and process; removed Project Completion section
			204	Changed sheet numbering; added guidance for adding sheets during Advance Plans
			205	Table format, heading and text changes
			206	Minor format and text changes; added diameter example
		300	302.2, 302.3, 302.4	Clarifying text; update title block examples; added link to Bridge Naming Rules
			303	Text changes to Location Map description and Figure 303-2 description
		400	402.1, 402.2	Clarifying text
		500	502	Updated text for 501 Bridge Maintenance Plans descriptions and bent labeling
			503-512	Minor text changes; updated and added figures
		600	601	Added clarifying text for requesting structure and drawing numbers
		700	701	Revised process text; revised Figure 701-1
	11/13/2023	100	101	Direction to abbreviations and acronyms in the OCM; updated hyperlinks
		200	203.1	Revised step number 3, added number 6; updated workflow text
			203	Added hyperlink to checklist text
			204	Changed sheet numbering for wall sheets; changed guidance for adding sheets during Advance Plans to Final Plans
			205	Updated table 205-1

Revision	Date	Part	Section	Description
		300	302.2, 302.3, 302.4	Clarifying text; update title block examples; added link to Bridge Naming Rules
			303	Text changes to Location Map description
		400	402.1, 402.2	Clarifying text
		500	502	Updated text for 501 Bridge Maintenance Plans descriptions and bent labeling
			508	Added text regarding Railroad Data sheet
			504-513	Update figures for standards changes; added figures 512-3, 512-4, 513-1, 513-2, 513-3, 513-4, 513-5, 513-6, 513-7, 513-8, 513-9, 513-10, 513-11
		700	701	Added text to check for revisions during construction
		800	801, 802	CAD File Archives
1.1	01/25/2024	500	502	Clarified bent labeling and numbering guidance
1.1		700	701	Added text to use EOR initials in the revision block
2.0	05/31/2024	200	201, 203, 203.1	Clarified language; updated fig. 203-1
			204	Common detail sheets
			205	updated fig. 205-1
			206.1	Diameter symbol
			206.2	Remove steel shape callouts
			206.4	Bridge Tables
			206.5	Bridge Cache
		300	302.2	Specified 2D coordinate correct plan view
			302.4	Text added for multiple structures and designers; updated figs. 302-1, 302-2, 302-3, 302-4
		500	502	Clarify “BIR” designation and elevation on the opposite side of the alignment
			503-2, 504-1, 504-2, 505-2, 505-5, 505-6, 509-3, 510-1, 510-4,	Update/Add figure

Revision	Date	Part	Section	Description
			513-1, 513-4, 513-10	
		700	701	Clarified date and revision number for construction revisions. Added guidance for as-constructed review process

Part 100 Introduction

Section 101 Preface

The Bridge CAD Manual (BCM) is a supplement to the ODOT CAD Manual (OCM), which includes the procedures, methods, and standards for developing and preparing final Bridge construction and maintenance plans. Where the two manuals conflict, the BCM takes precedence. It also provides the standards used in the preparation of these plans using the Computer Aided Drafting (CAD) in MicroStation format to be used by ODOT staff, consultants and outside agency personnel.

ODOT staff and consulting engineer staff working on ODOT Bridge projects will perform bridge CAD services and construction and maintenance plan production using ODOT's current version of Bentley MicroStation or OpenBridge Modeler software, as required.

This publication contains information, instructions and examples for the preparation of major structure plans, such as bridges (including culverts over 20' in diameter/span), tunnels, sound walls attached to a bridge and bridge retaining walls (as defined by the Geotechnical Design Manual (GDM)). Other major structures requiring a BDS number are in the respective discipline's section of the plans and are drawn according to their CAD manual.

Updates to this manual are an ongoing process and revisions are issued as required or every six months in May and November.

Section 102 Introduction

This manual includes direction and guidance for structure plans development including CAD files, plans layout and development, sheet order and numbering. Example drawings are included for common plan sheets. Abbreviations and acronyms are found in the OCM.

Section 103 Resources

ODOT Manuals and Other Documents

ODOT CAD Manuals

ODOT Standard Drawings and Details

ODOT Standard Specifications and Bid Items

Bridge Section Manuals and Forms

Bridge Design Manual

Bridge Guidance Documents

1. Includes:
    a. Bridge Data System (BDS) User Guide
    b. Structure Naming and Numbering
    c. Bridge Log

Bridge Forms and Templates

1. Includes:
    a. Checklists
    b. Structure and Drawing Number Request Form

CAD Software and ProjectWise Support

Engineering Applications Support Team (EAST)

ProjectWise

Archived Projects and GIS Data

ODOT TransGIS

Bridge Data System (BDS) – Contact ODOT Bridge Engineering Section for access

ODOT Map Center (R/W Maps and Contract Plans)

ODOT Engineering Archives

Virtual Highway Corridor (ODOT only)

Part 200 General Plans Development

Section 201 Introduction

This General Plans Development section of the Bridge CAD Manual includes information pertaining to structure CAD files and sheets for a set of structure plans included in the "J" series of an ODOT plan set. Standards for other structures not included in this manual can be found in the respective CAD manuals. For general ODOT plans standards, including abbreviations and common terms, see the ODOT CAD Manual (OCM).

Section 202 Overview

There is a general process that applies to all structural CAD files and drawings. This process ensures that record copies of these CAD files and drawings are maintained for future reference.

Section 203 CAD Standards Plans Review

The CAD standards plans review will be performed by another CAD Tech, during plans production, to assure adherence to the ODOT standards, as well as consistency in the plan set. This does not preclude reviews required by consultant contract.

The reviews may be done at any time during the plans development process, however there are scheduled reviews:

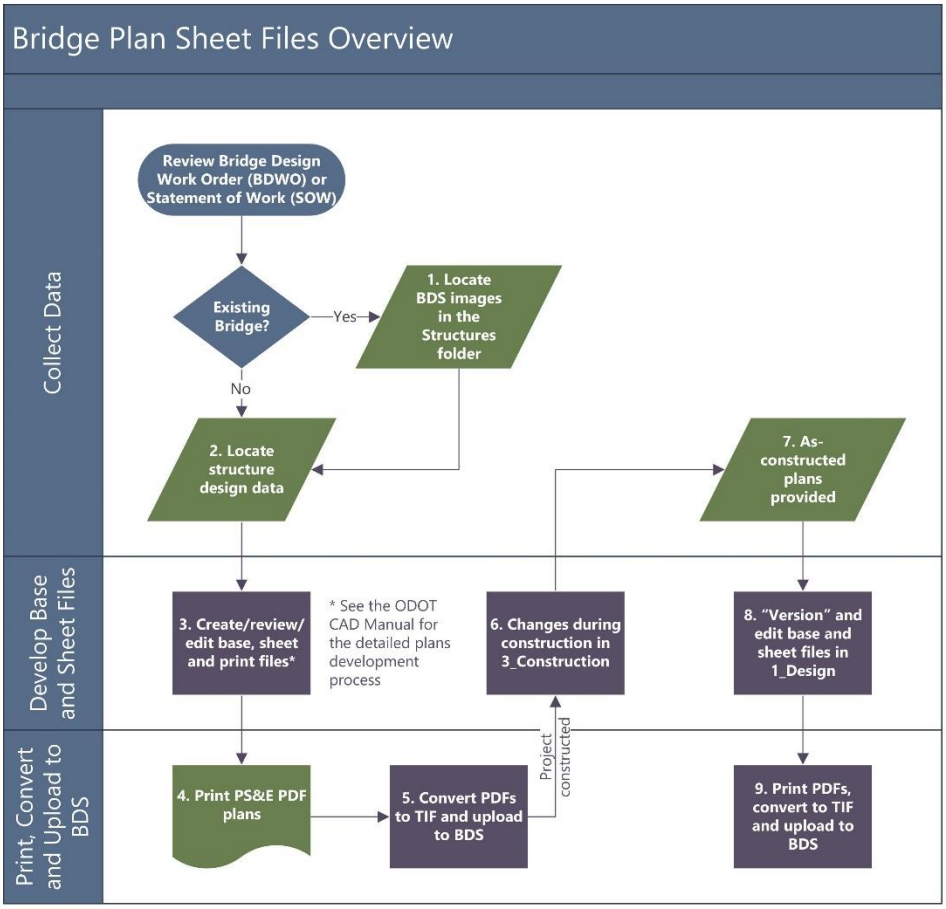
1. STIP projects CAD plans review will be performed two weeks prior to the bridge design "Submit to Reviewer" at DAP and at Advance plans. Large projects using multiple CAD Techs require multiple reviewers. When there are multiple reviewers, a CAD reviewer lead will be designated.
2. District maintenance and other small projects that don't conform to the same review process as a STIP project will have a single review at two weeks prior to the Final plans "Submit to Reviewer".

Link to CAD Review Checklist

203.1 Structural plan sheet development process summary

Below, is an overview of the bridge plan sheet development process between the designer and CAD tech. See the ODOT CAD Manual (OCM) for a detailed *project* workflow process.

Figure 203-1 Bridge Plan Sheet Files Overview Flow Chart



1. Locate the data needed to develop the plans. Create and maintain CAD files in ODOT's ProjectWise folder structure in accordance with the OCM and the ODOT ProjectWise User's Manual. All documents must be named in accordance with the ProjectWise naming conventions and include the structure number(s) in the file attributes.
2. After plans are developed, produce PDFs in the ProjectWise "Structures" folder and provide a link to the designer to access the file for review. Repeat this process until plans are adequately developed for the upcoming milestone review. A link to the PDF is also

made available to the CAD Tech reviewer, according to Section 203 of this manual. Make edits and continue the edit and review process for each submittal.

3. When the risk of adding or removing sheets is low, typically after the Advance Plans review, the CAD Tech obtains drawing numbers from the Bridge Data System (BDS). See the Bridge Data System User Guide for details. The Bridge Designer provides the calculation book number from Bridge Section headquarters, as required.
4. At the Plans, Specifications and Estimate (PS&E) milestone, the CAD Tech prints PDFs with the appropriate structure, calculation book and Bridge Data System (BDS) drawing numbers. The Bridge Designer, digitally signs the PDFs. See the OCM for details.
5. At bid opening, the CAD Tech exports the digitally signed PDF files to TIF files (400 dpi) and uploads the images into BDS. See the Bridge Data System User Guide for TIF file settings.
6. Changes during construction are completed in a copy of the file(s) to be modified in the Construction_Engineering folder in 3_Construction.
7. After the designer provides the as-constructed markups from the Region Engineer, the CAD Tech makes edits as directed. See Part 700 of this manual for the As Constructed procedure. When the edits are complete, new TIF images are created and uploaded into BDS to replace the contract plans images.

Digitally signed PDF files, CAD files and all other related documents will remain in ProjectWise with the project documents.

For local agency projects, original signed documents may be kept by the owner of the structure.

Section 204 Plan Sheet Numbering

In addition to a sheet number, structures also require a BDS drawing number for filing in BDS. (See the Bridge Data System User Guide for requirements.)

The plan sheet numbering and order are important aspects of the plan set. Users of the plans should be confident in finding the information they need. When there are multiple structures, it is important to be consistent throughout.

See the ODOT CAD Manual for general sheet numbering guidance. Below are some examples of structure sheet numbering options.

1. Single structure: J01, J02,…J32
2. Multiple structures:
    a. Structure Layout and Index: J01, J02

b. Common General Notes: J03

c. Bridge or Interchange A: JA01, JA02,…JA20 (incl. details specific to the structure)

d. Bridge or Interchange B: JB01, JB02,…JB32 (incl. details specific to the structure)

e. Common detail sheets: JZ01, JZ02,…JZ12 (details applicable to multiple structures)(include a list of the relevant structures below or next to the title of each detail)

3. Single Structure plans over 50 sheets:

   a. Option 1:

      i. General sheets: JA01, JA02,…JA05

      ii. Foundation sheets: JB01, JB02,…JB09

      iii. Superstructure sheets: JC01, JC02,…JC09

      iv. Substructure sheets: JD01, JD02,…JD20

      v. Miscellaneous sheets: JE01, JE02,…JE22.

      vi. Wall sheets: JF01, JF02,…JF05

   b. Option 2:

      i. General sheets: JA01, JA02,…JA05

      ii. Spans 1 through 4: JB01, JB02,…JB05

      iii. Spans 5 through 11: JC01, JC02,…JC09

      iv. Miscellaneous sheets: JD01, JD02,…JD09

      v. Wall sheets: JE01, JE02,…JE05

When it is necessary to add sheets after Final Plans, it is acceptable, but not preferable, to add a "-1", "-2", etc. to the sheet number to avoid renumbering sheets in that series. For example: JA01, JA02…JA20, JA20-1, JA20-2, JA21, etc.

Section 205 Plan Sheet Order

This is a general listing of sheets. The structure may not require all sheet types. There may also be details required that are not listed.

NOTE: Some details and notes may be added to related sheets as space is available.

Table 205-1 Plan Sheet Order

SHEET CATEGORY	SHEET TITLE AND NOTES
GENERAL	Structure Index • Project overview map identifying the location of each structure and an accompanying table with structure, sheet and drawing number information Structure Layout • Plan overview of complex structures, such as interchanges Plan and Elevation • Includes Location map • The Elevation view may not be required for projects that don't have work below the deck (surfacing projects, for example) General Notes Live Load and Design Criteria (if not included in the General Notes) Grade Line Profile Superelevation Diagram Clearance Diagram Construction Sequence and Concrete Pour Sequence Railroad Data • Data shown per railroad approval Stage Construction

FOUNDATION DETAILS	Geotechnical Data • Sheet provided by Geotechnical CAD. Uses the Geology naming convention for the sheet file. Foundation Plan • Includes existing and proposed utilities, seismic details, pile tip data and Foundation Notes Foundation Details • Footing, Drilled Shaft Details
SUPERSTRUCTURE DETAILS	Deck Plan • Includes deck plan "bubble" notes and rail pay limits Typical Deck Section Deck Details Diaphragm Details Steel Framing Plan Steel Framing Details Girder Schedule Girder Plan and Elevation Girder Section and Details Camber Diagram Post-tensioning Details Seismic Details
SUBSTRUCTURE DETAILS	Bent # Plan and Elevation Bent # Details Crossbeam Details Bearing and Shear Lug Details Seismic Details Wingwall Details Bridge Retaining Wall Details • See the Geotechnical Design Manual for the definition of a "Bridge Retaining Wall"

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MISCELLANEOUS DETAILS	Excavation and Backfill Details Concrete Finish Diagram Bridge Approach Slab Details Joint Details Traffic Sign/Signal/Luminaire Mount Details Rail, Rail End Post and Rail Transition Details Protective Screening Details Sound Wall Details • Sound walls attached to the bridge will be in the bridge plans. If the sound wall extends beyond the bridge approach slab, that portion beyond the slab will reside in the Geotechnical plans. Slope Paving Details Drainage Details Utility Details Illumination Details Bridge Protective System Details Fall Protection System Details Cathodic Protection Details Protective Coatings Details Mechanical Details Electrical Details Architectural Treatment Details Temporary Concrete Barrier Details Temporary Work Bridge Details
DETAILS COMMON TO MULTIPLE STRUCTURES	When multi-structure projects have common details, place them after the structure sheets and number them using JZ##.

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Section 206 Notes, Annotations and Tables

The general guidance for note formatting and orientation is available in the OCM. This section of the BCM will address the general notes, labels and tables used in structure plans and the CAD tools available for them. When abbreviations are required, use only accepted abbreviations from the OCM.

206.1 General Notes and "Floating" Notes

The General Notes are included in nearly all structure project plans. They can range from a few sentences to multiple pages. A Microsoft Word template for the General Notes is downloadable here: General Notes. Some notes have been created as tables in the workspace to control formatting. Use abbreviations sparingly and spell out acronyms the first time they are used.

The diameter symbol (∅) may only be used in dimensions and leader notes and not in "floating" notes.

"Floating" notes requiring extra emphasis, may be outlined by a rectangular shape.

Many common notes are available in the Bridge Bubble Note tool *(pending)*, Structure Cache and Place Table.

206.2 Dimensions and Labels

Dimensions and labels standards are set by the "ODOT ft-in" dimension style, except where decimal format is the industry standard.

Table 206-1 Dimension Precision Table

Item	Tolerance
Structural Steel	$^1/_{16}$"
Welds	$^1/_{16}$"
Concrete	$^1/_8$"
Camber Diagrams	$^1/_8$"

NOTE: If a series of dimensions do not add up to the exact overall dimension, use a plus or minus symbol (±) following the series dimension (e.g. 25 girder spaces @ 9'-3$^1/_8$"± = 231'-7").

Dimensions of 12 inches or greater are expressed in feet-inches (e.g. 1'-0"). Dimensions of more than one foot with fractions less than one inch require a leading zero (e.g. 1'-0½"). Pipe diameters are always called out in inches.

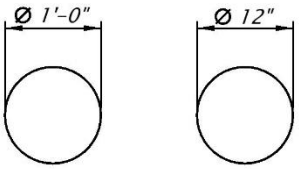
Intersection angles should be dimensioned as the acute angle centerline to centerline.

Use the industry defined format for steel shapes and welding symbols.

Steel plate is dimensioned as thickness x width x length where thickness and width are expressed in inches and length in feet and inches (e.g. PL¼ x 8½ x 1'-4").

In addition to the diameter and radius options in the ODOT CAD Manual, bridge plans allow the following options:

Figure 206-2 Diameter and Radius Dimension examples



206.3 Match Lines

Pending

206.4 Bridge Tables

Tables are to use the standards defined in the OCM for text. Premade tables are available as a seed in the Place Table dialog (may be linked to an Excel file, as desired).

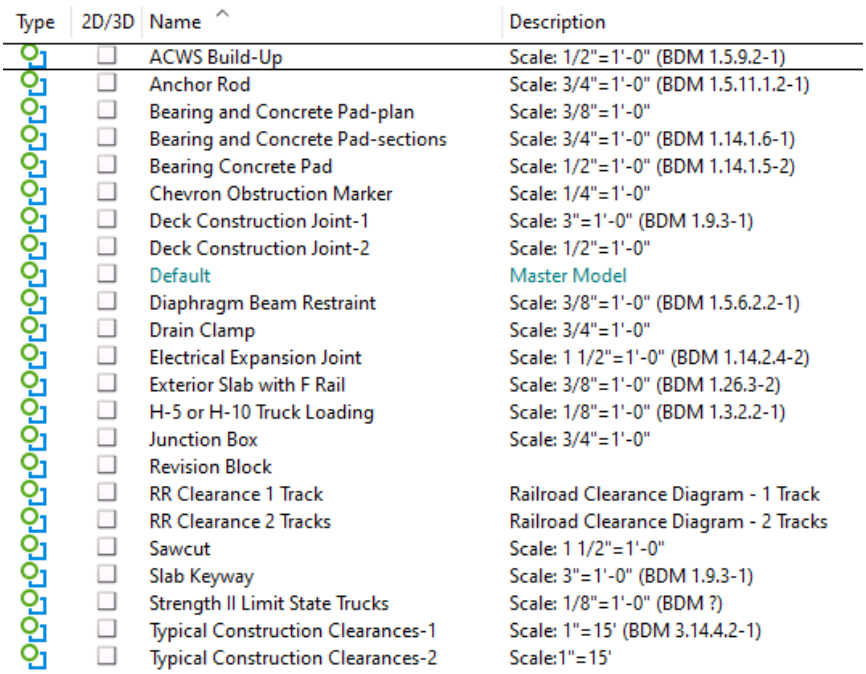
Bridge Tables currently available (Geo and Hydro tables are also available):

- ODOT_AccompByBox
- ODOT_NotForConsBox
- BR_BeamSeatEl_(Heading, Body, Footer)
- BR_FndData_(Heading, Body)
- BR_GirderSchedule_(Heading, Body)
- BR_HydData
- BR_IDXStructures_(Heading, Body, Footer)
- BR_PileData_(Heading, Body)
- BR_ReinfSpliceLen
- STR_IDXStructures_(Heading, Body, Footer)

206.5 Bridge Cache

The bridge cache is part of the ODOT workspace.

Figure 206-3 Models available in the bridge cache file



Type	2D/3D	Name	Description
		ACWS Build-Up	Scale: 1/2"=1'-0" (BDM 1.5.9.2-1)
		Anchor Rod	Scale: 3/4"=1'-0" (BDM 1.5.11.1.2-1)
		Bearing and Concrete Pad-plan	Scale: 3/8"=1'-0"
		Bearing and Concrete Pad-sections	Scale: 3/4"=1'-0" (BDM 1.14.1.6-1)
		Bearing Concrete Pad	Scale: 1/2"=1'-0" (BDM 1.14.1.5-2)
		Chevron Obstruction Marker	Scale: 1/4"=1'-0"
		Deck Construction Joint-1	Scale: 3"=1'-0" (BDM 1.9.3-1)
		Deck Construction Joint-2	Scale: 1/2"=1'-0"
		Default	Master Model
		Diaphragm Beam Restraint	Scale: 3/8"=1'-0" (BDM 1.5.6.2.2-1)
		Drain Clamp	Scale: 3/4"=1'-0"
		Electrical Expansion Joint	Scale: 1 1/2"=1'-0" (BDM 1.14.2.4-2)
		Exterior Slab with F Rail	Scale: 3/8"=1'-0" (BDM 1.26.3-2)
		H-5 or H-10 Truck Loading	Scale: 1/8"=1'-0" (BDM 1.3.2.2-1)
		Junction Box	Scale: 3/4"=1'-0"
		Revision Block	
		RR Clearance 1 Track	Railroad Clearance Diagram - 1 Track
		RR Clearance 2 Tracks	Railroad Clearance Diagram - 2 Tracks
		Sawcut	Scale: 1 1/2"=1'-0"
		Slab Keyway	Scale: 3"=1'-0" (BDM 1.9.3-1)
		Strength II Limit State Trucks	Scale: 1/8"=1'-0" (BDM ?)
		Typical Construction Clearances-1	Scale: 1"=15' (BDM 3.14.4.2-1)
		Typical Construction Clearances-2	Scale:1"=15'

Part 300 MicroStation Base Files & Title Block

Section 301 Introduction

This section of the Bridge CAD Manual includes information pertaining to all or most of the CAD files and sheets for a set of structure plans. For overall ODOT plans standards, see the ODOT CAD Manual.

Section 302 CAD Files

302.1 Overview

All project CAD and associated files are to be produced and maintained in ODOT's ProjectWise folder structure. When a project requires multiple CAD Techs, a CAD Tech Lead is agreed upon to coordinate plans production, review, and organization.

302.2 Plans Base Reference Files

♦ Base Models

The Design Base file is a **design** type model created in the 3_Base Files (2D) folder and/or a "container" file in the 6_Civil Data folder that references a 3D model in the 1_Design>Structures folder. The 2D plan view of the structure is coordinate correct and references data provided by other disciples in the previously mentioned folders. This data may be used for more than one structure plan sheet, as well as used by other disciplines. The Engineer is ultimately responsible for this data and coordinates with the CAD Tech to ensure its accuracy.

If in a separate file, the location map image is considered "base" data and uses the "CAD Base" naming convention in ProjectWise.

The CAD base contains drawings for use in the plan sheets. Linework is referenced from base and container files available.

302.3 Plan Sheet Files

Sheet files are in the *2_Plan Sheets* folder and may contain one or more sheet models. Sheet models reference the title block and design or drawing models. It is best practice to use the

sheet number as the name of the sheet model, then create a text field for the sheet number in the title block that points to it. The sheet model description may be used for the sheet title in the title block and create a text field in the sheet title to point to it, if not using the titles from the title block file. Annotation in a sheet model applies to that specific sheet, such as the sheet number, the drawing number and general text.

302.4 Structure Title Block

The title block file contains design type models for the title block and text common to the sheets. Some sheet titles are pre-populated in the title block file and may be used for the sheet by turning levels on or off. See the ODOT CAD Manual for details about how the title block file is used.

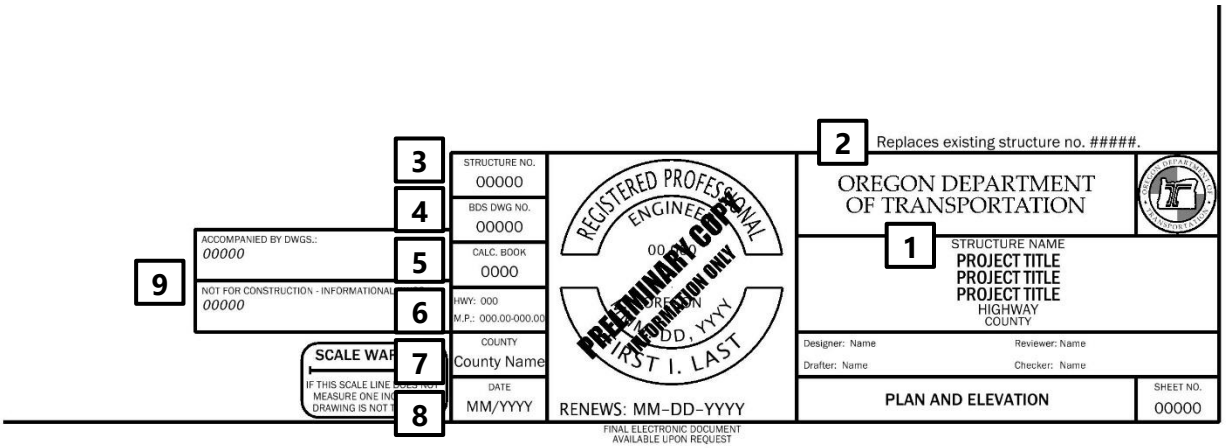
The plan sheet title block gives the reader crucial information about the plan set and the sheets in it. If it is consistent in its layout, then the user can efficiently find the information they need for bidding and construction. The ODOT CAD Manual contains the basic elements that make up the title block. This section provides guidance for the parts of the title block that are specific to structure plans.

When projects have multiple structures, copy the Structures model as required.

- **For structures that have multiple designers, make separate models for the data that differs from the main Structures**

model. When possible, avoid duplication of data. Plan and Elevation Sheet

Figure 302-1 Example title block for the plan and elevation sheet for a single structure.



1 Enter the structure name used for the Bridge Data System (BDS). See Bridge Naming Rules

2 Include when replacing an existing structure.
For local agency structures show *Agency, structure name, no. XXXX*

3 Bridge Data System (BDS) structure number.

4 BDS drawing number.

5 Calculation book number provided by the Designer.

6 ODOT highway number, as applicable. Milepoint at the location of the structure as defined by the BDS naming rules or the applicable design manual.

7 County where the structure is located.

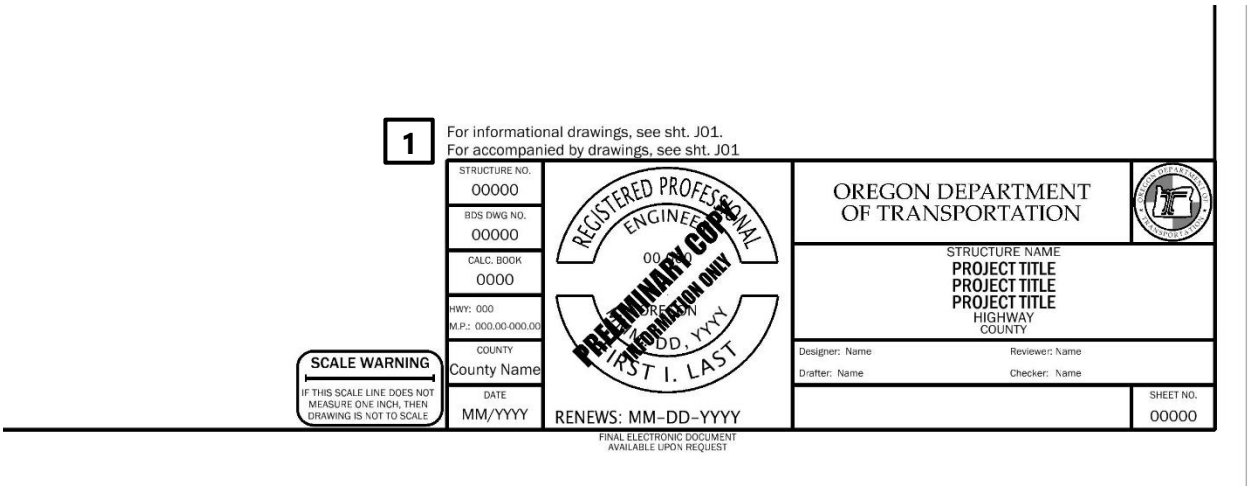
8 Month and year of applicable submittal.

9 The "Accompanied By Dwgs." appears on the first sheet for each structure and lists the remaining sheets in the plans for that structure, sheets in other sections of the plans and standard drawings required for the structure. The "Not For Construction – Informational Dwgs." appears on the first sheet for each structure when existing as-

constructed plans are being referenced. These boxes may be located along side or above the title block, but should be kept together when both are required.

♦ Detail Sheet

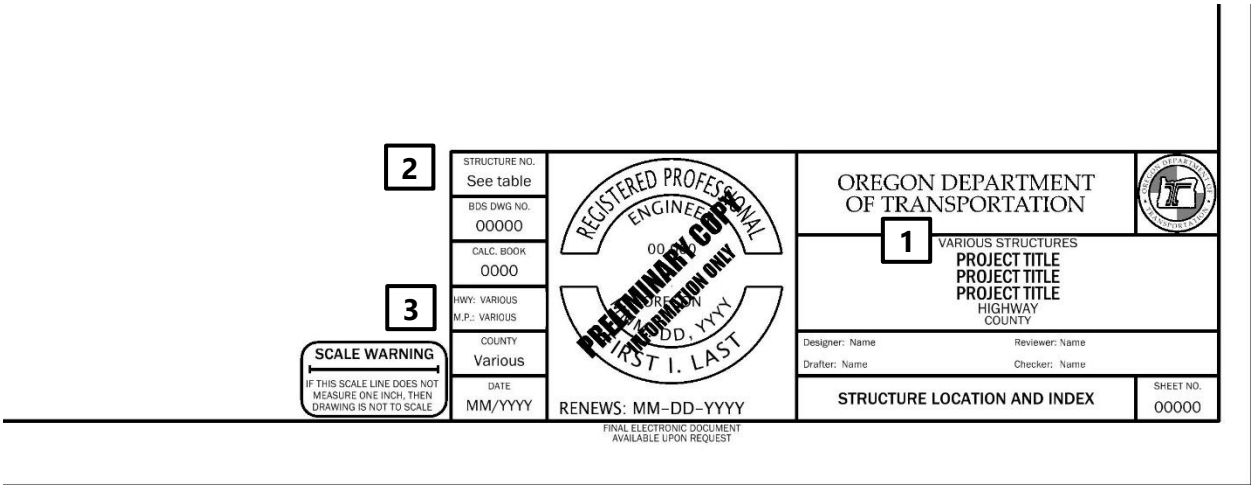
Figure 302-2 Example title block for the remaining sheets for a single structure plan.



1 Use these notes to refer to the first sheet for the structure (the sheet number callout may be different than shown). The "For informational drawings…" note applies to structures when existing plans are being referenced.

♦ Multiple Structures – Location and Index Sheet

Figure 302-3 Example title block for the layout and index sheet for a project with multiple structures.



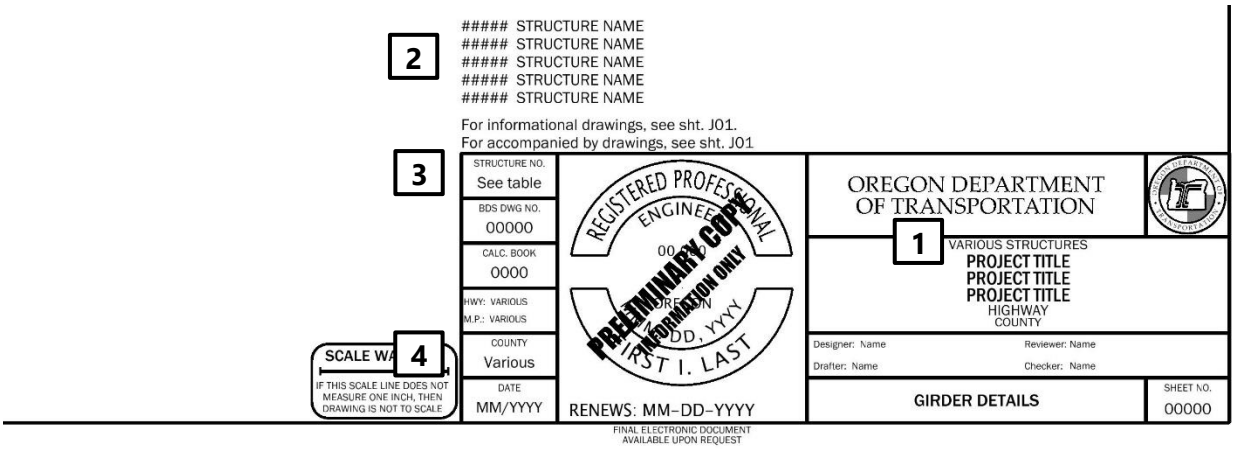
1 When there are multiple structures that the sheet applies to, enter "Various Structures" in place of the structure name.

2 Enter "See table", referring to the table of structures.

3 Enter "Various" for highway, milepoint and county as needed.

♦ Multiple Structures – Common Detail Sheet

Figure 302-4 Example title block for a common detail sheet for a project with multiple structures.



1 When there are multiple structures that the sheet applies to, enter "Various Structures" in place of the structure name.

2 If the sheet applies to multiple structures, list the numbers and names of the applicable structures.

3 For multiple structures, enter "See Above" and list the applicable structures above the title block or "See Left" and list the structures left of the title block. If the project identifies the structure by a letter or number, add the appropriate designation in parenthesis after the structure name.

4 Enter "Various" for highway, milepoint and county, as required.

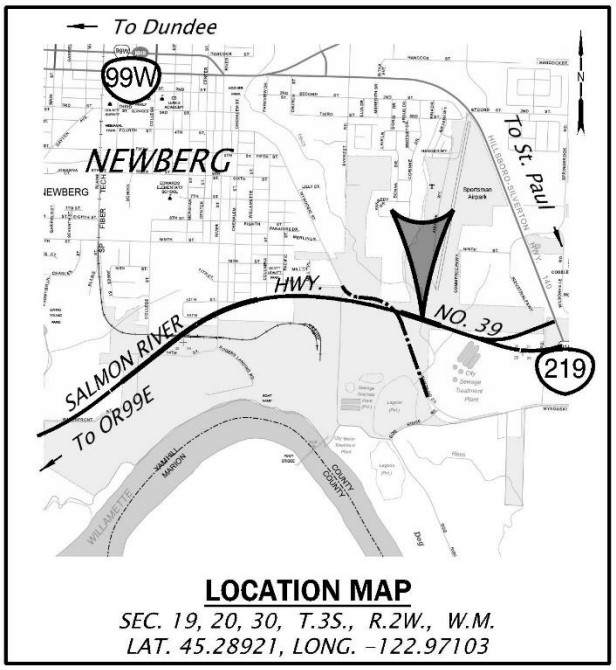
Section 303 Location Map

A location map is required. It should be located in the upper right or lower left of the Plan or Plan and Elevation sheet. The map may be a raster image or a CAD map. Often the text in the map is too small, so text must be added for the highway, city name and other pertinent data must be added. The location marker symbol is placed to mark the location of the structure.

The GIS "Project Vicinity Mapping Application" may be used to create a mapping image. For larger rural areas, the "Topographic" base map seems to work best. For smaller urban areas, try the "ODOT Streets" base map.

303.1 Single Structure

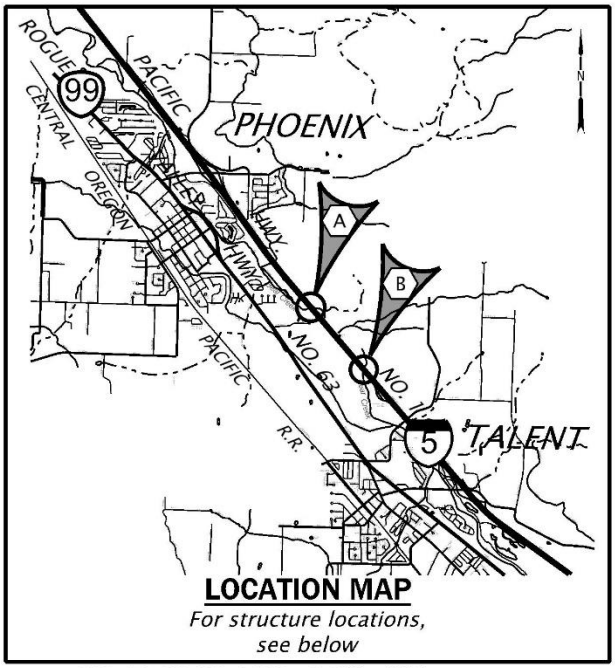
Figure 303-1 Example location map for a single structure plan.



303.2 Two Structures on a Single Plan Sheet

More than two structures require a layout and index sheet.

Figure 303-2 Example location map for two twin structures (shown) or up to four single structures plan.



SEC. 19, 20, 30, T.3S., R.2W., W.M.
(A) LAT. 45.26589, LONG. -122.79867 (str. no. 12345) &
LAT. 45.26594, LONG. -122.79822 (str. no. 12346)

(B) LAT. 42.25876, LONG. -122.79006 (str. no. 22345) &
LAT. 45.25901, LONG. -122.78988 (str. no. 22346)

Part 400 3D Modeling

Section 401 Introduction

ODOT Bridge Section is working to develop protocols for developing 3D models of various structures. OpenBridge Modeler (OBM) in coordination with OpenRoads Designer (ORD) is the software used for modeling bridges. MicroStation Connect Edition (MSCE) is also used for components.

Section 402 Open Bridge Modeler (OBM)

402.1 OBM Files

The OBM file is a "design" file created by or under the direction of the Bridge designer, using the OBM seed file and stored in the *Design_Data* folder in ProjectWise. *(Pending OBM being added to the ODOT workspace)*

402.2 Alignments

OBM requires a horizontal and vertical roadway alignment. This alignment is provided by the Roadway designer using OpenRoads Designer (ORD) in coordination with the Bridge designer. Because OBM links the bridge model to the alignment, changes to the alignment will affect the bridge model. The ORD vertical alignment that is used by the bridge model must be set to "active". If there are no Roadway plans for the project or the model must be created prior to the creation of an ORD alignment, OBM can be used to create a temporary roadway alignment.

402.3 Templates

Templates are created and stored in a template library and are used by OBM to extrude or place 3D components. A variety of standard templates have been created and are available in the ODOT template library. Since changes to the templates will affect the model, create a folder in the OBM template library for all templates used for the project. In the project template folder, rename any standard templates used. Name templates for the project using this format: *template name-structure#*.

402.4 Process Overview

1 Part 500 Plan Sheets

Section 501 Bridge Maintenance Project Plans

Plans for bridge maintenance projects follow the basic standards for CAD drawings and Bridge Data System images. The amount of detail will vary depending on the project scope. For example, overlay and bridge joint projects can provide all the necessary information on a single sheet per bridge. Structural repair projects will typically require much more detail and several detail sheets.

Section 502 Bridge Bent Labels and Numbering

For all structures, add the label "(BIR Bent 1)" to the first bent label by *milepoint* (e.g. Bent 1 (BIR Bent 1). If the project stations are in the opposite direction of the milepoints, additional "BIR" numbers, increasing by milepoint, may be added. In non-standard situations, identify with "(BIR Bent 1)" the bent that is called Bent 1 in the Bridge Inspection Report. ("BIR"= Bridge Inspection Report)

For new structures, all supports are designated as a "Bent" and are numbered in the direction of project stationing. Add the BIR number per the direction above.

For existing structures on projects with a roadway alignment, bents are numbered in the direction of project stationing. Add the bent designations from the existing plans in parenthesis to each bent and add the BIR number per the direction above. Add the appropriate bent numbering note from the Bridge cell library.

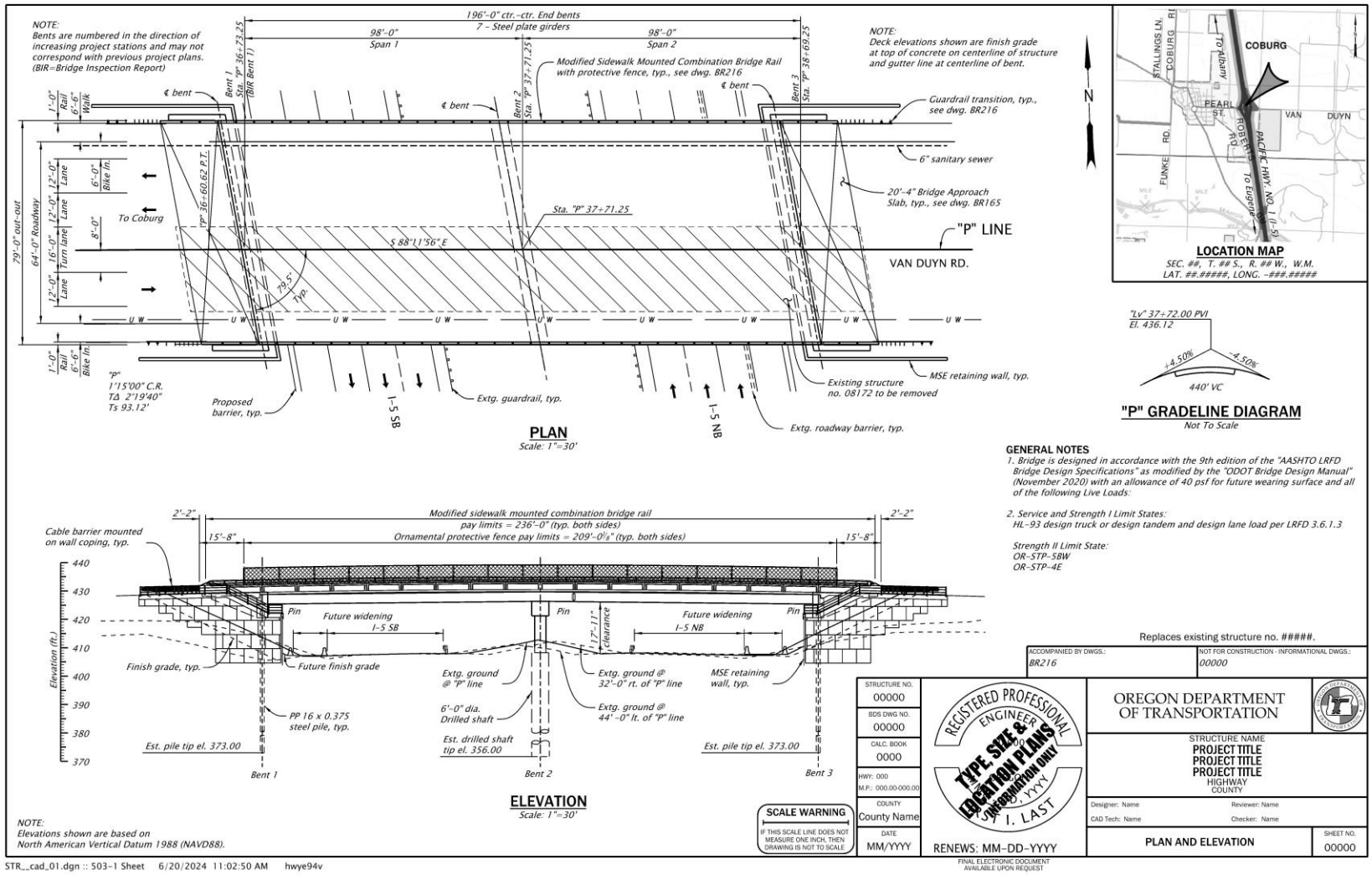
For existing structures on projects with no roadway alignment, use the bent designations from the existing plans and add the BIR number per the direction above. Add the appropriate bent numbering note from the Bridge cell library.

The structure *plan* views will be shown with project stationing increasing from left to right on the sheet. Circumstances may result in the elevation view stations increasing in the opposite direction of the plan view, see Section 505.

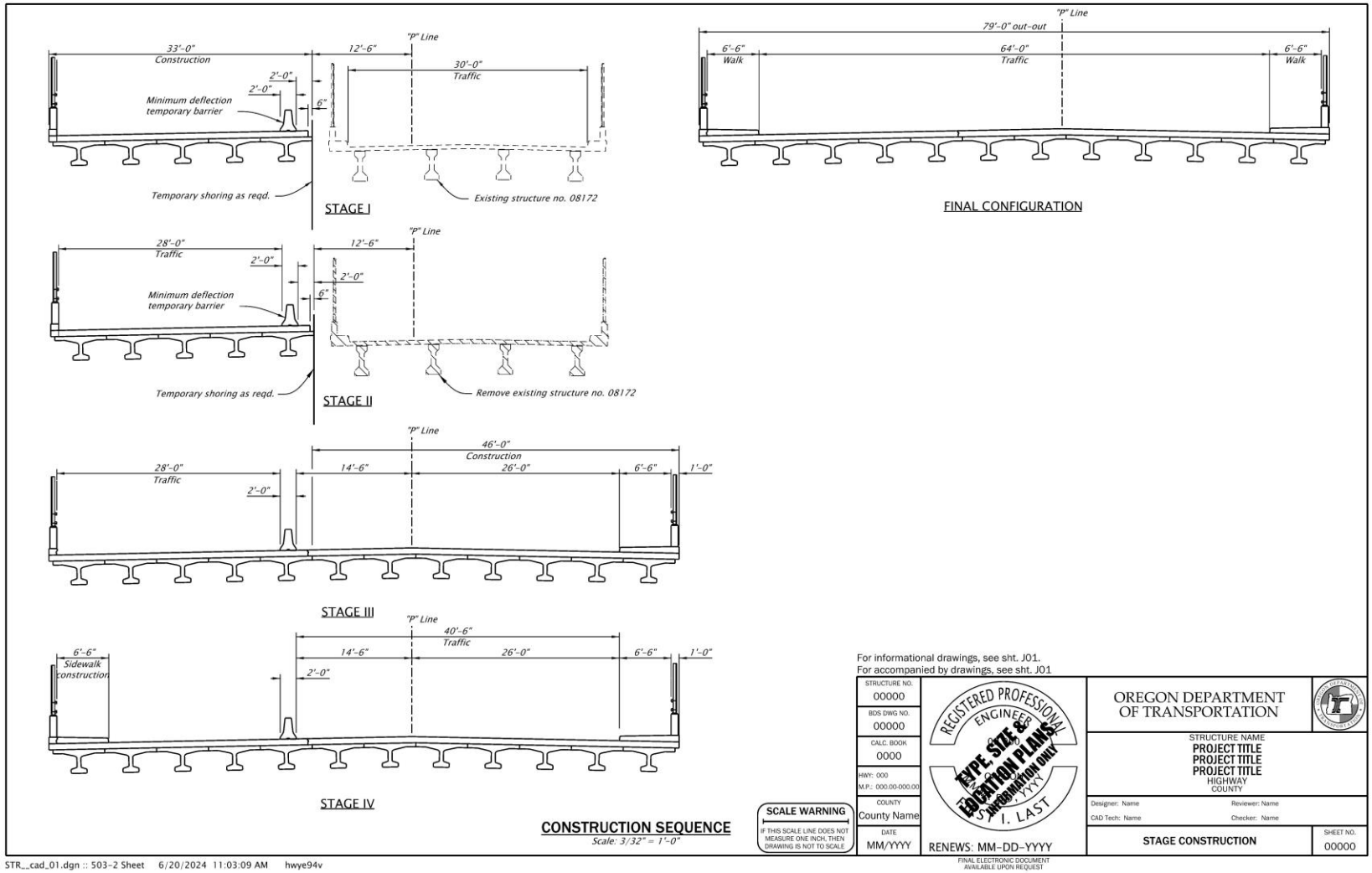
Section 503 Type, Size and Location (TS&L)

The Type, Size and Location (TS&L) sheets illustrate the footprint and concept of the design of a structure (including alternates as needed) and is usually provided prior to the Design Approved Plans (DAP) milestone. For a more detailed explanation and the required drawings (additional drawings may be needed), see the Bridge Design Manual (BDM), Section 2 - Processes and Roles.

Figure 503-1 TS&L Plan and Elevation

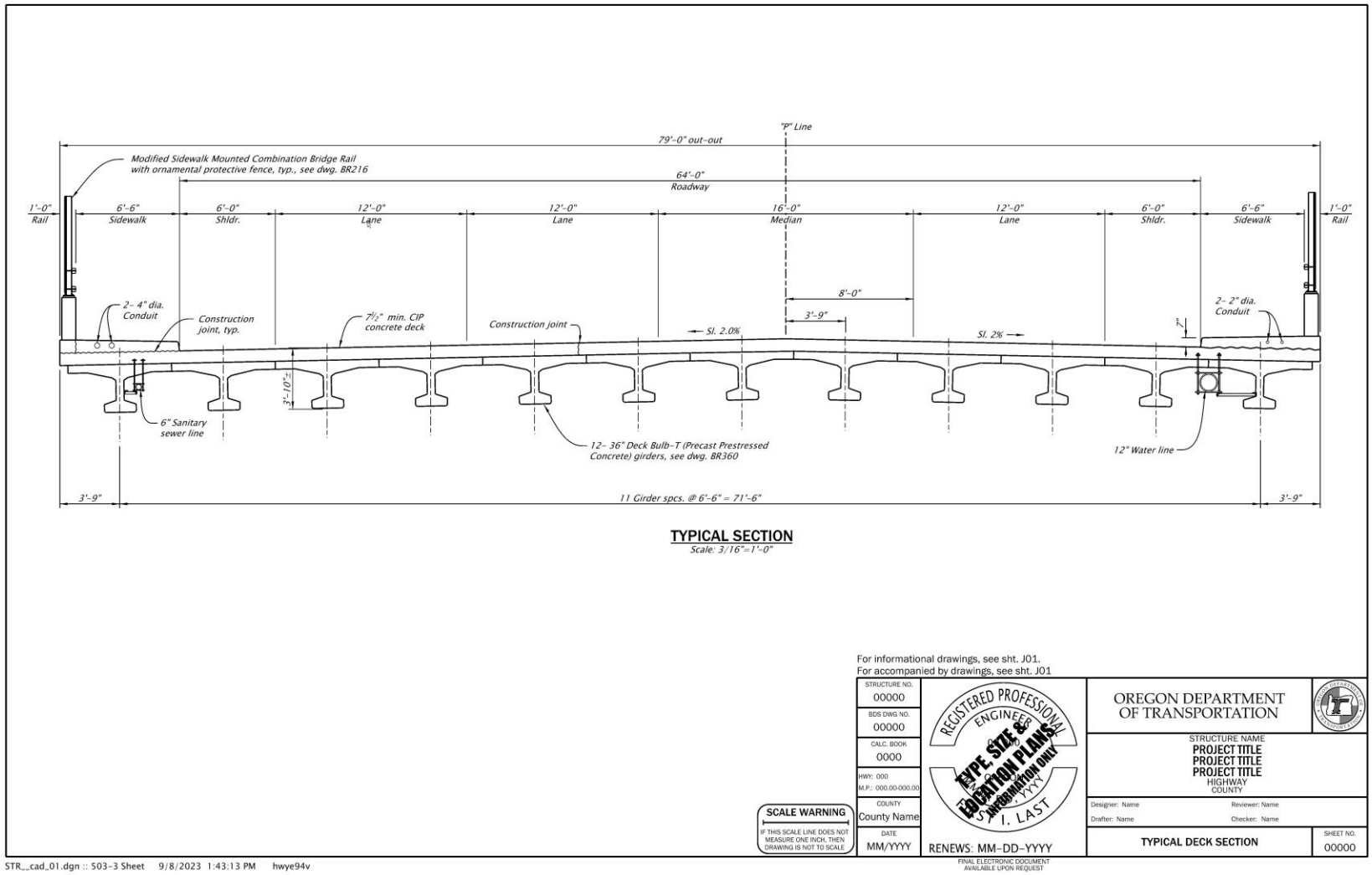


34 Figure 503-2 TS&L Stage Construction



35

Figure 503-3 TS&L Typical Deck Section



Section 504 Structure Index

A structure index is provided when there are multiple structures under the same contract. On this sheet, a map showing the locations of the structures and a table including the structure numbers with their corresponding sheet and drawing numbers followed by the standard drawings needed for the project (See OCM for sheet numbering).

Figure 504-1 Structure Index

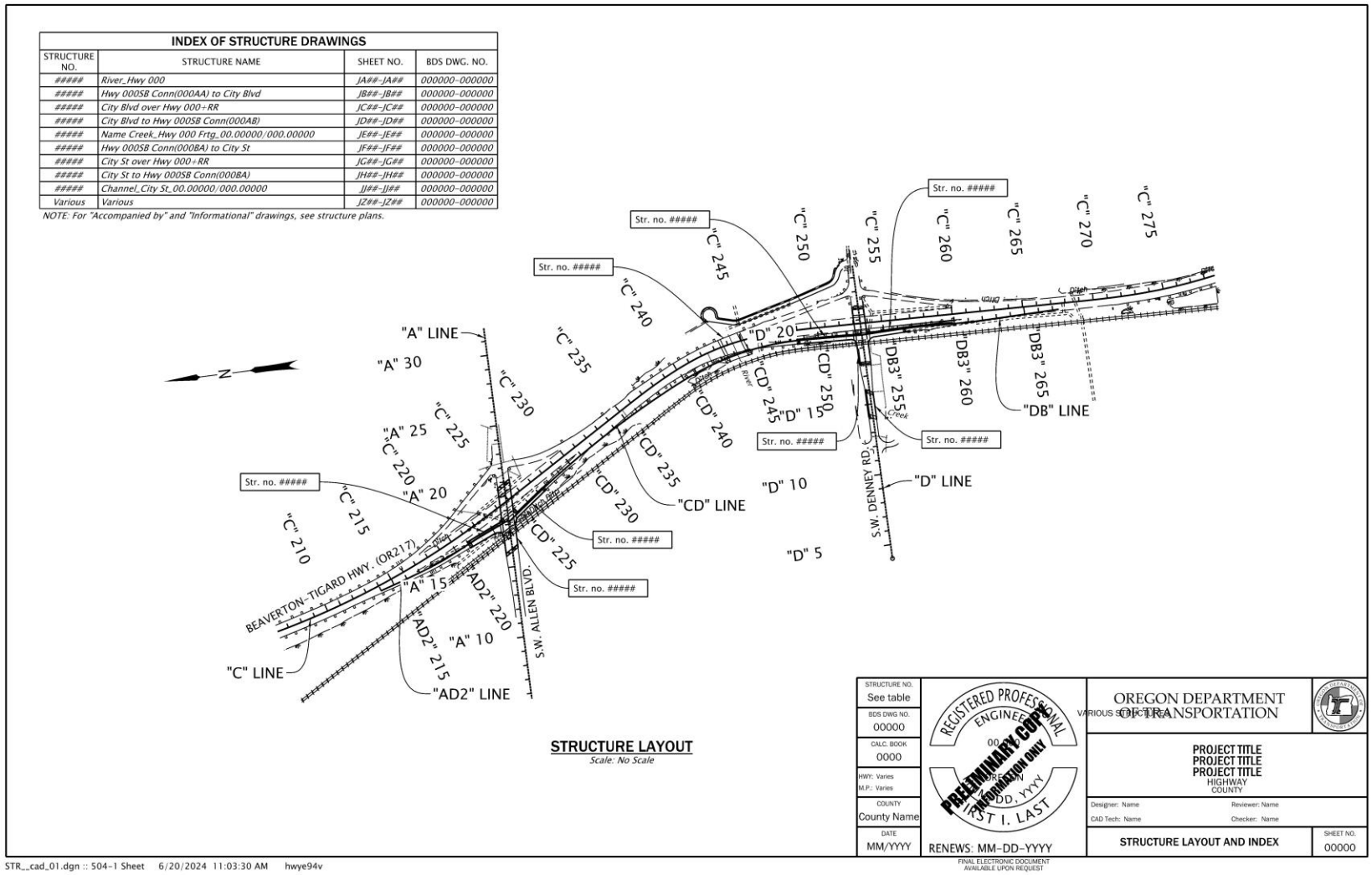
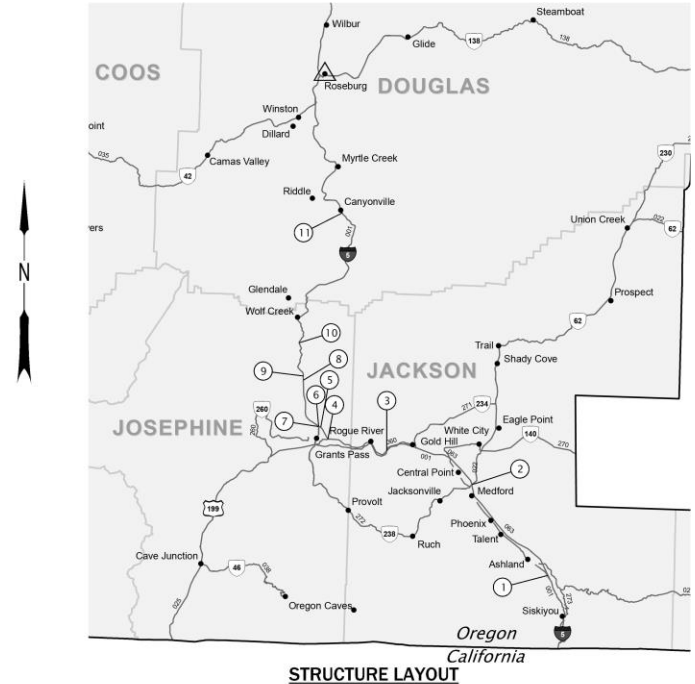


Figure 504-2 Structure Index with Representative Plan

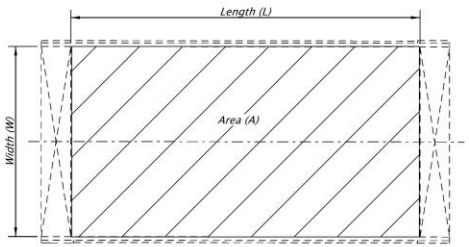
INDEX OF STRUCTURES

BRIDGE	BDS STRUCTURE NO.	STRUCTURE NAME	MILEPOINT	BRIDGE LENGTH (ft.)	ROADWAY WIDTH (ft.)	BRIDGE DECK AREA (sq. ft.)	SCOPE OF WORK	NOT FOR CONSTRUCTION–INFORMATIONAL DWGS.
1	######	Hwy 00 over Hwy 0 (S Ashland Intchg)	000.00	000.00	00.00	0,000	Perform deck seal	00000
2	######	Hwy 00 over McAndrews Rd	000.00	000.00	00.00	0,000	Perform deck seal	00000
3	######	Hwy 0 NB over Hwy 00	000.00	000.00	00.00	0,000	Perform deck seal	00000
4	######	Hwy 00 over Hwy 000WB Spur	000.00	000.00	00.00	0,000	Perform deck seal	00000
5	######	Hwy 0 over Hillcrest Dr	000.00	000.00	00.00	0,000	Perform deck seal	00000
6	######	Hwy 0 over Scoville Rd	000.00	000.00	00.00	0,000	Perform deck seal	00000
7	######	Hwy 0 over Hwy 00 NB	000.00	000.00	00.00	0,000	Perform deck seal	00000
8	######	Jumpoff Joe Cr_Hwy 0 SB	000.00	000.00	00.00	0,000	Perform deck seal	00000
9	######	Monument Dr (Jumpoff Joe Conn001DF) over Hwy 1	000.00	000.00	00.00	0,000	Perform deck seal	00000
10	######	Grave Creek_Hwy 0 NB	000.00	000.00	00.00	0,000	Perform deck seal	00000
11	######	Hwy 1 over 5th St (Conn 001EZ)(Canyonville)	000.00	000.00	00.00	0,000	Perform deck seal	00000

Accompanied by drawings: BR000, RD000



STRUCTURE LAYOUT
Not To Scale



TYPICAL PLAN
Not To Scale

SCALE WARNING
IF THIS SCALE LINE DOES NOT MEASURE ONE INCH, THEN DRAWING IS NOT TO SCALE

STRUCTURE NO.	See Table
BDS DWG NO.	00000
CALC. BOOK	0000
HWY: 000 M.P.: Varies	
COUNTY	County Name
DATE	MM/YYYY

REGISTERED PROFESSIONAL ENGINEER
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FIRST I. LAST
RENEWS: MM-DD-YYYY
FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

VARIOUS STRUCTURES
PROJECT TITLE
PROJECT TITLE
PROJECT TITLE
HIGHWAY
COUNTY

Designer: Name Reviewer: Name
CADTech: Name Checker: Name

STRUCTURE LAYOUT AND INDEX SHEET NO. 00000

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Section 505 Plan and Elevation

The plan drawing is a view from above with stationing increasing from left to right on the sheet. Milepoints are used if the project is using milepoints in place of stationing. The plan view is paired with an elevation drawing on the same sheet. The elevation drawing is shown as a view of the right side, when facing in the direction of increasing stations of the structure and is placed below the plan view.

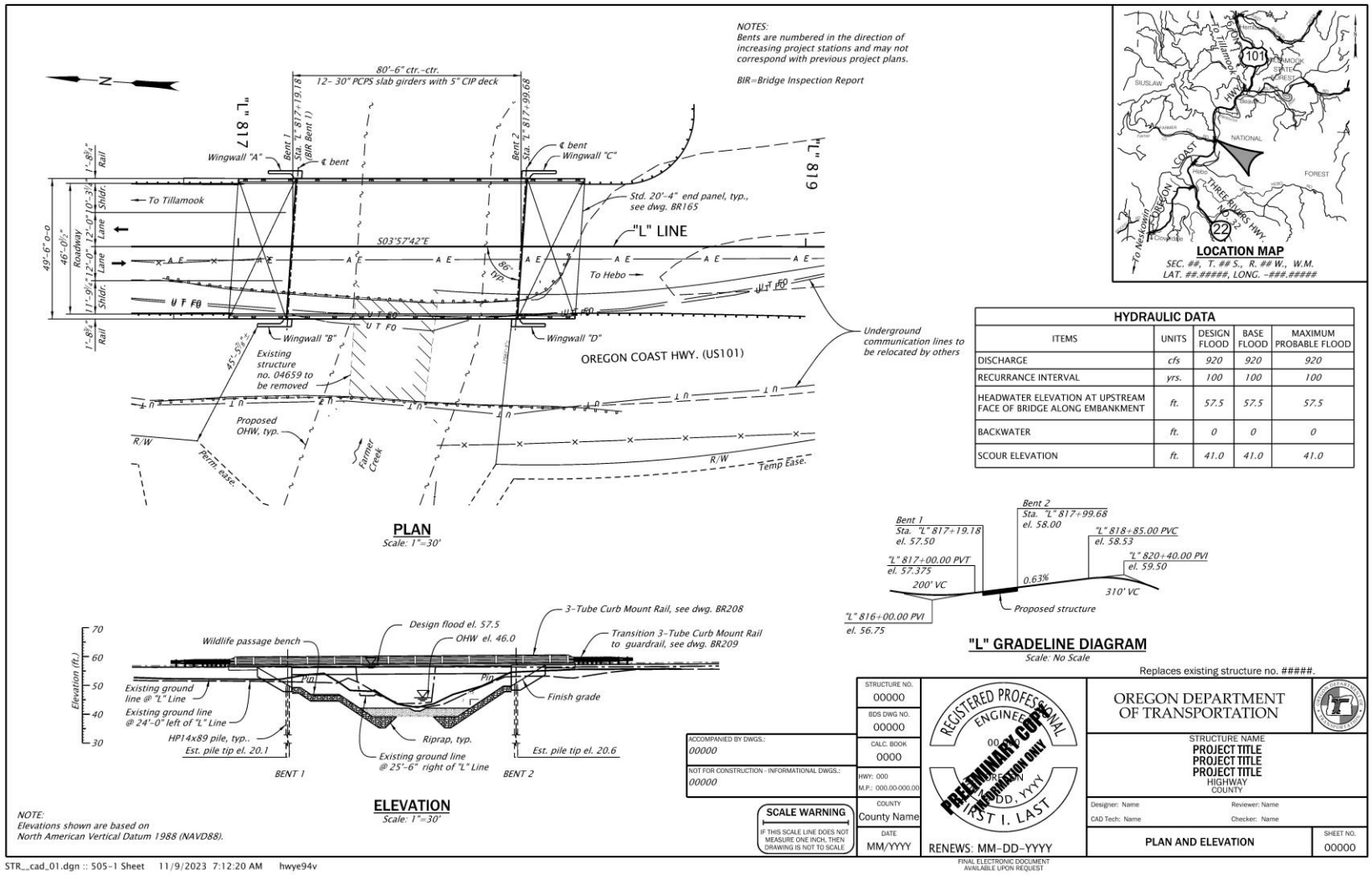
For projects not requiring an elevation view, such as paving and joint repair, the plan view and details are sufficient.

Make the plan and elevation as large as possible, leaving room for the location map in the upper right or lower left corner. If the drawing is still too small, it should be simplified and used as an overview, then add sheets of one or two spans per sheet to show the detail required for the plan and elevation drawings.

If the structure is a retaining wall, half viaduct or other structure where the right side is not visible or the project work is only being done on the left side, then the left side is shown as a "View A-A" and placed above the plan view. Extra annotation and notes are added to clarify that the drawing is shown from the opposite side.

Show the superstructure type on the "out to out" measurement for the bridge on the Plan and Elevation view only. All other notes and dimensions will use "girder" for longitudinal and "beam" for transverse components.

67 Figure 505-1 Structure Plan and Elevation



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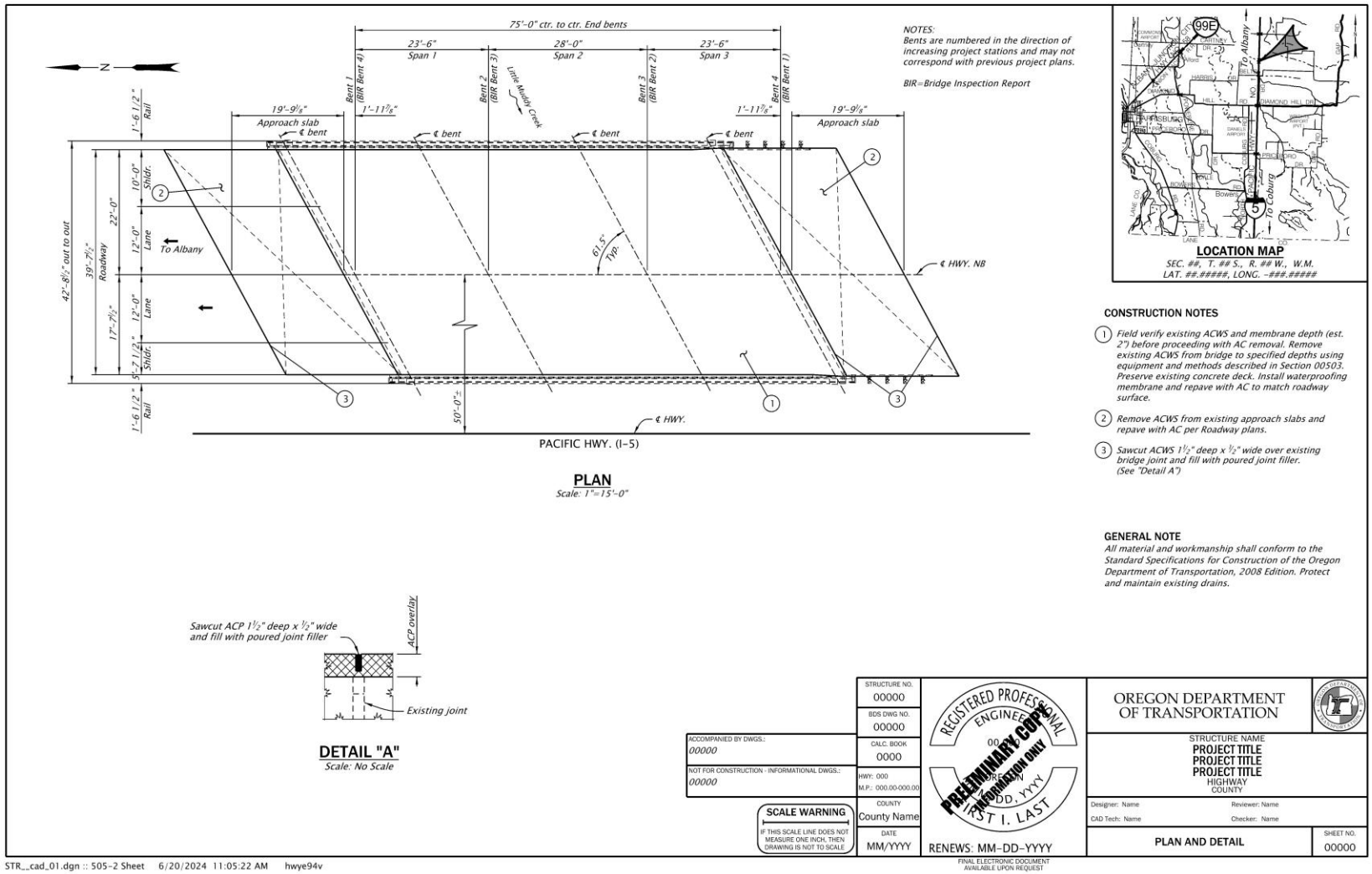
69 Figure 505-2 Twin Structures Separate Plan



70

71 Figure 505-3 Twin Structures Combined Plan

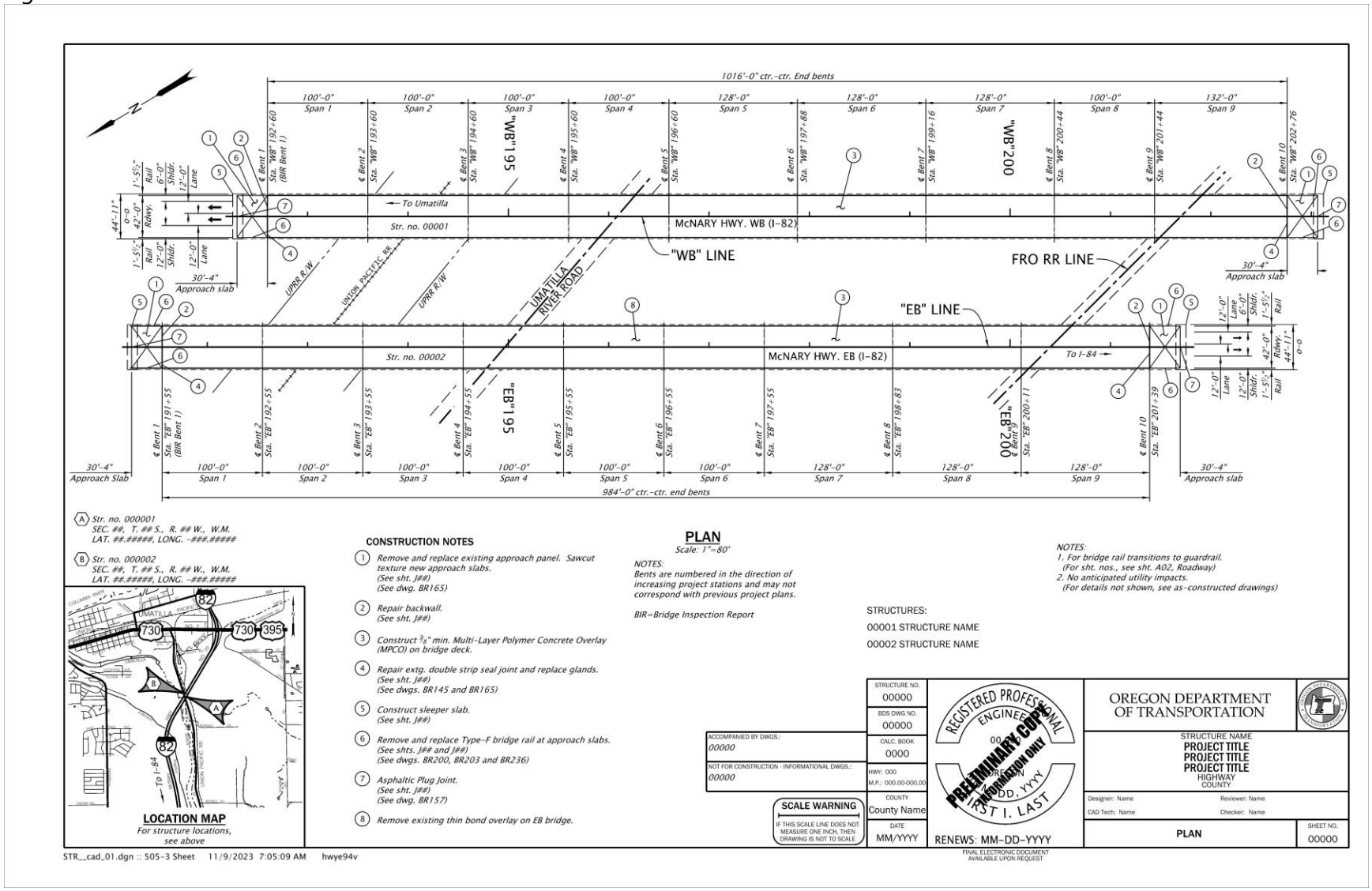


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Figure 505-4 Plan and Developed Elevation

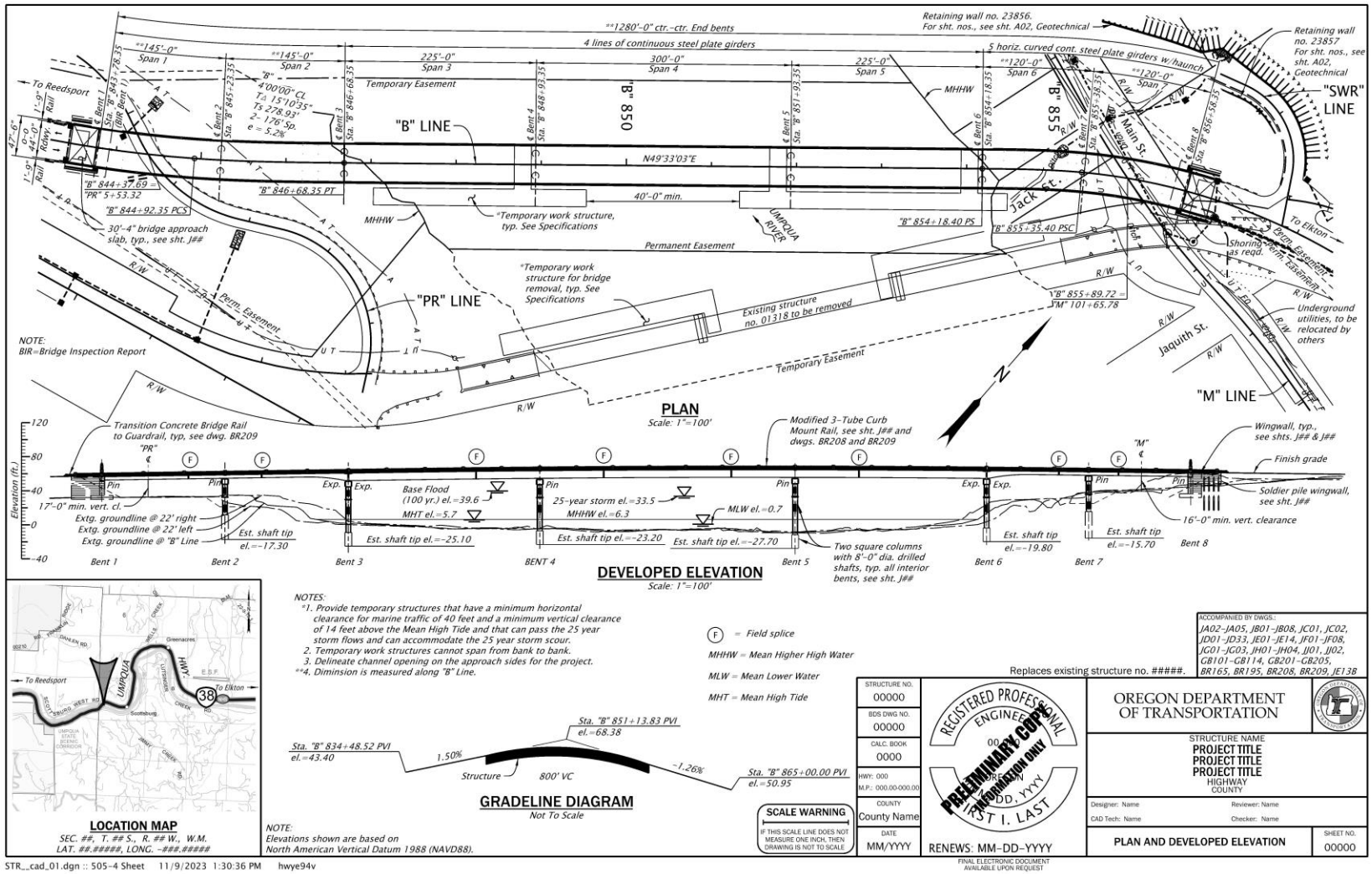
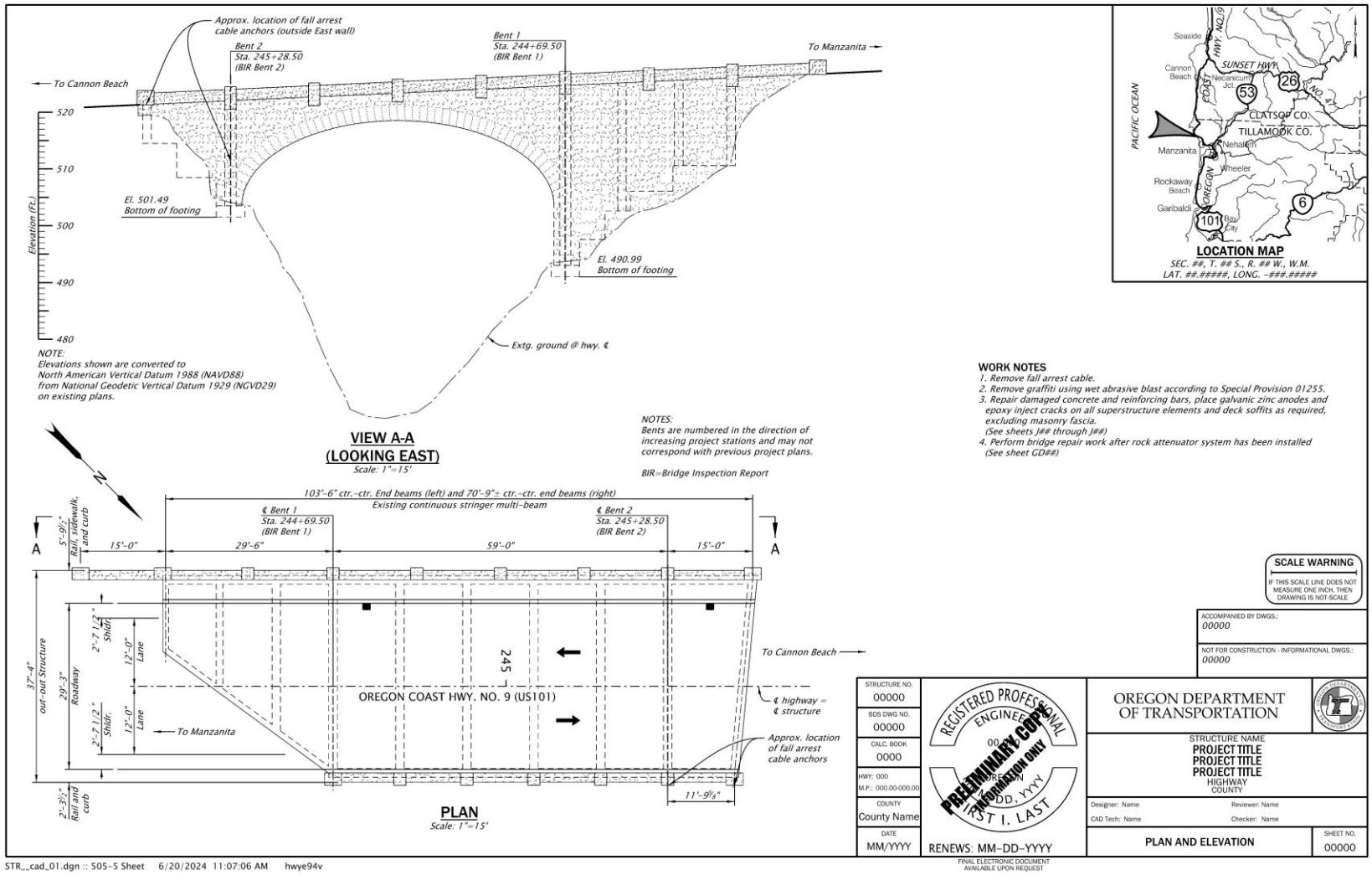
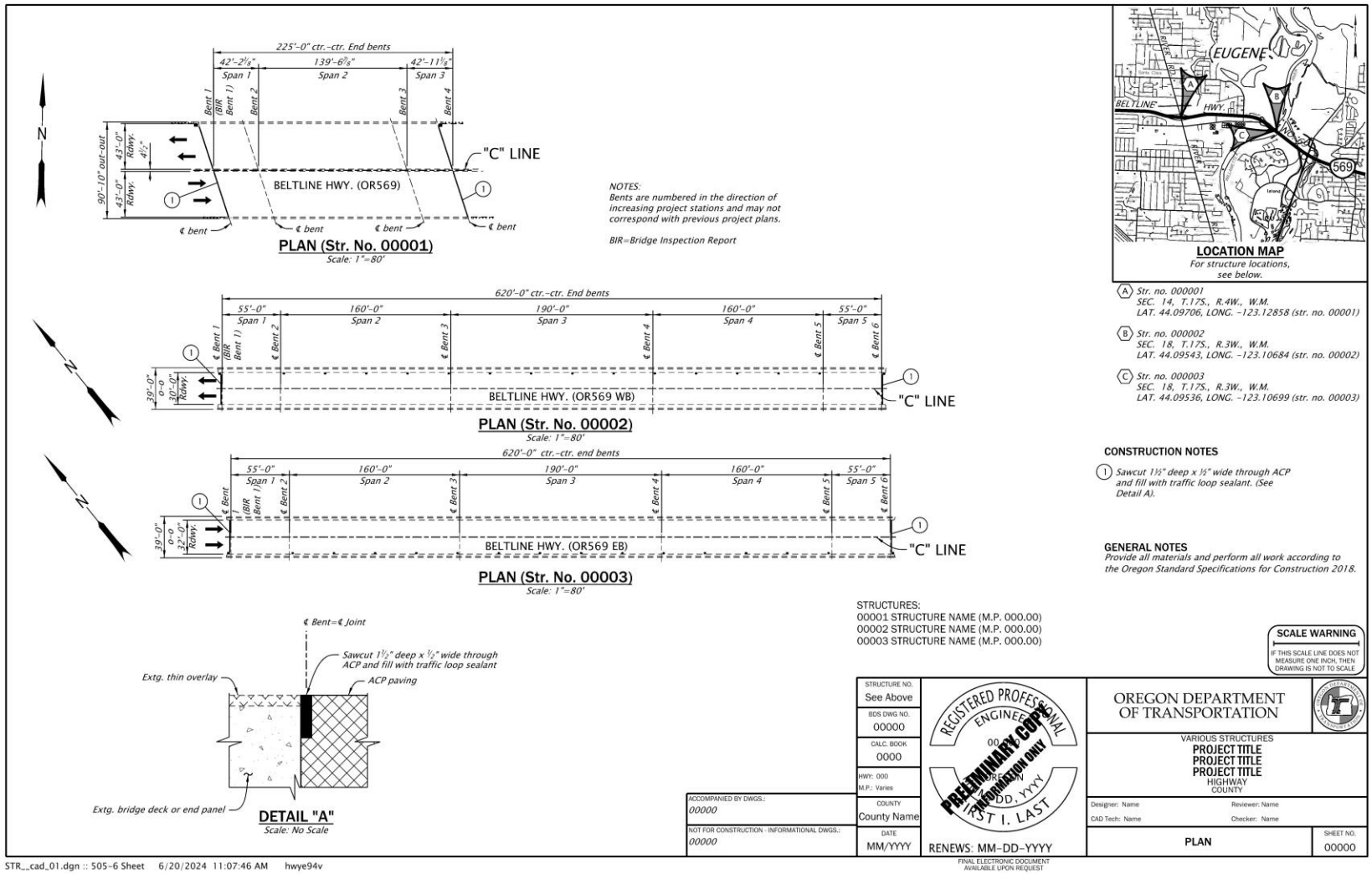


Figure 505-5 Plan and View A-A (Elevation)



77 Figure 505-6 Multiple Structures Plan



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Section 506 General Notes

The General Notes are typically provided by the designer. A separate General Notes sheet is needed when the notes won't fit on the Plan and Elevation sheet. If there is a General Notes sheet, there may also be room for some diagrams or small details, such as the Bridge Identification Marker information, excavation/backfill, superelevation, concrete finish diagram or similar general detail. A template of the General Notes is available as part of the Bridge Design Manual online.

86 Figure 506-1 General Notes

GENERAL NOTES:

DESIGN NOTES:
Provide all materials and perform all work according to the Oregon Standard Specifications for Construction 2021.

Bridge is designed in accordance with the 8th edition of the AASHTO LRFD Bridge Design Specifications (September 2017), and ODOT Bridge Design Manual (June 2020), with an allowance of 40 psf for future wearing surface and all of the following Live Loads:

Service and Strength I Limit States:
HL-93: Design truck or the design tandems and the design lane load.

Strength II Limit State:
ODOT Type STP-5BW Permit truck
ODOT Type STP-4E Permit truck

Seismic design is performed in accordance with the "AASHTO Guide Specifications for LRFD Seismic Bridge Design" as modified by the "ODOT Bridge Design Manual". The Horizontal Peak Ground Acceleration Coefficient (PGA) for the 1000-year return (Life Safety) is 0.5074g, based on 2014 USGS Seismic Hazard Maps. The bridge site is defined as a Site Class D with Site Factor (Fpga) of 1.10.

For pile foundation notes and details, see the foundation plan and the cast-in-place pile details.

CONSTRUCTION NOTES:
Provide uncoated reinforcing steel according to ASTM Specification A706, or AASHTO M31 (ASTM A615) Grade 60. (Provide Field bent stirrups according to ASTM Specification A706.) Use the following splice lengths (unless shown otherwise):

Reinforcing Splice Lengths (Class B) Grade 60 f'c = 3.3 ksi, λrc = 0.4, 2 in. min. concrete clear cover										
Bar Size	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14 & #18
Uncoated	1'-4"	1'-9"	2'-2"	2'-7"	3'-1"	3'-6"	3'-11"	4'-5"	4'-11"	Not permitted

Reinforcing Splice Lengths (Class B) Grade 60 f'c = 3.3 ksi, λrc = 0.4, 2 in. min. concrete clear cover										
Bar Size	#3	#4	#5	#6	#7	#8	#9	#10	#11	#14 & #18
Uncoated	1'-4"	1'-6"	1'-11"	2'-3"	2'-7"	3'-0"	3'-4"	3'-9"	4'-2"	Not permitted

Increase all splice lengths 30% for horizontal or nearly horizontal bars so placed that more than 12" of fresh concrete is cast below the bar.

Splice reinforcing steel at alternate bars, staggered at least one splice length or as far as possible, unless shown otherwise.

Support the bottom mat reinforcing steel from the forms with precast mortar blocks at 24" maximum centers each way. Support the top mat of reinforcing steel from the bottom mat of reinforcing steel with wire bar supports as shown in Chapter 3 of the CRSI Manual of Standard Practice (SBU, BBU, or CHCU). Place wire bar supports at 24"maximum centers.

Place bars 2" clear of the nearest face of concrete unless shown otherwise.

The top bends of stirrups extending from prestressed precast units may be shop or field bent.

Do not fabricate reinforcing steel for walls until final footing elevations have been determined in the field.

Provide Class 4000 3/8, drilled shaft concrete for cast-in-place piles.

Provide Foundation Concrete, Class 3300 1 1/2, 1 or 3/4 for pile caps.

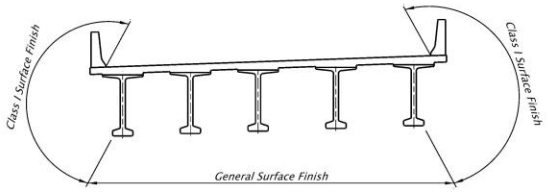
Provide Deck Concrete, Class HPC4500 1 1/2 concrete in deck and end panels.

Provide General Structural Concrete, Class 3300 1 1/2, 1 or 3/4 for Beam 'E', Beam 'D' and wingwalls.

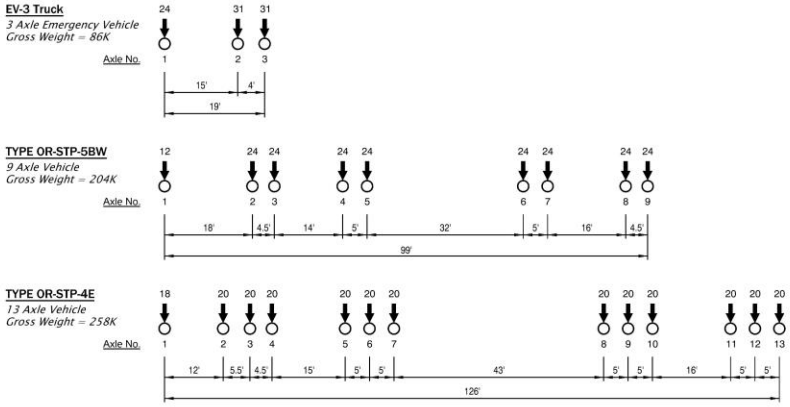
Provide concrete in precast prestressed girders according to detail plans.

Provide prestressing steel according to detail plans.

WELDING NOTES:
Produce welds according to the latest edition of AWS D 1.5 Bridge Welding Code.



CONCRETE FINISH DIAGRAM
Not to Scale



STRENGTH II LIMIT STATE TRUCKS
NOTE: Units are kips and feet

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DATE	MM/YYYY

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PRELIMINARY COPY FOR INFORMATION ONLY
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FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

STRUCTURE NAME
PROJECT TITLE
PROJECT TITLE
PROJECT TITLE
HIGHWAY
COUNTY

Designer: Name Reviewer: Name
CAD Tech: Name Checker: Name

GENERAL NOTES

SHEET NO. 00000

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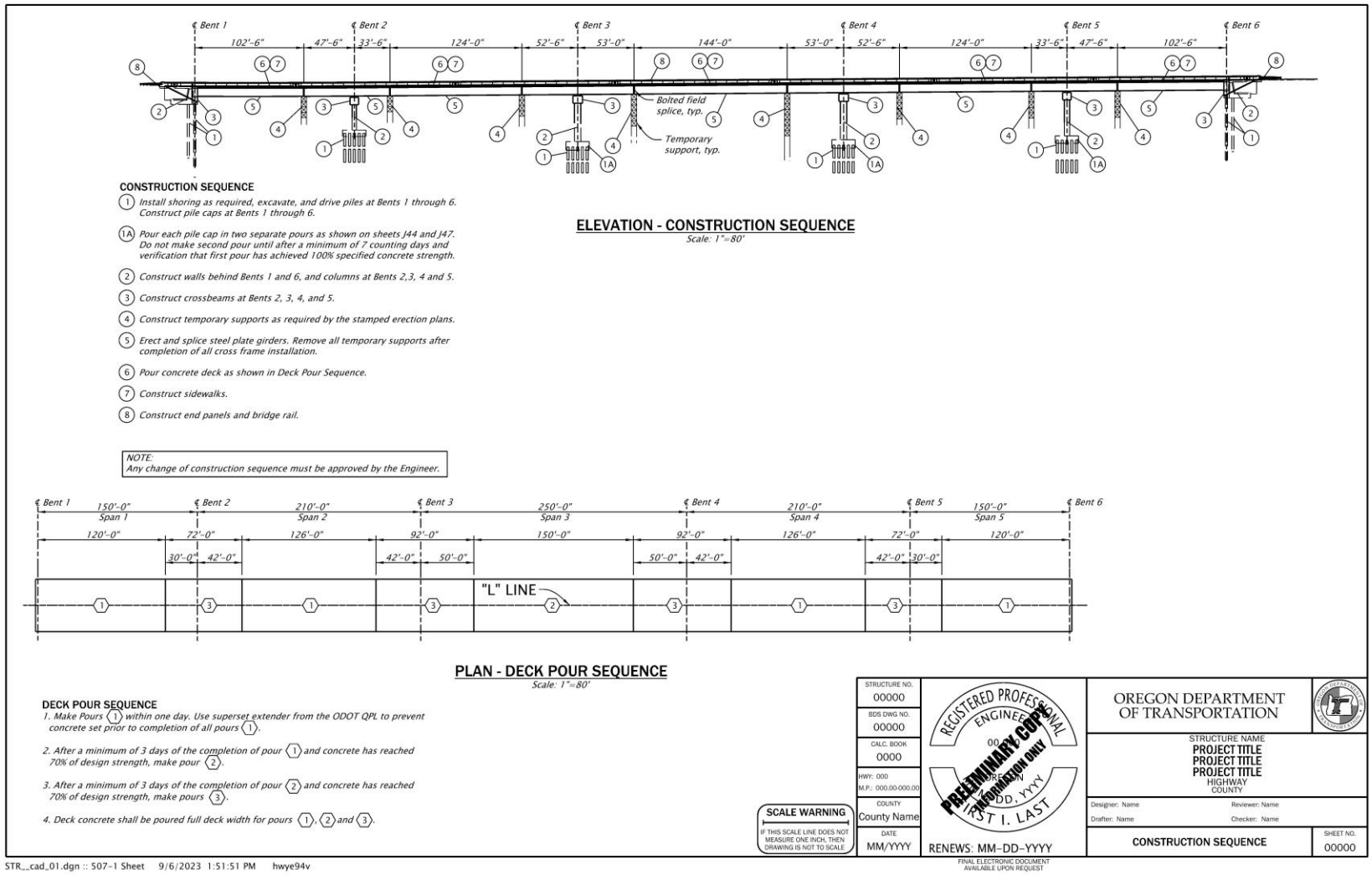
Section 507 Construction Sequence

90 Figure 507-1 Construction Sequence



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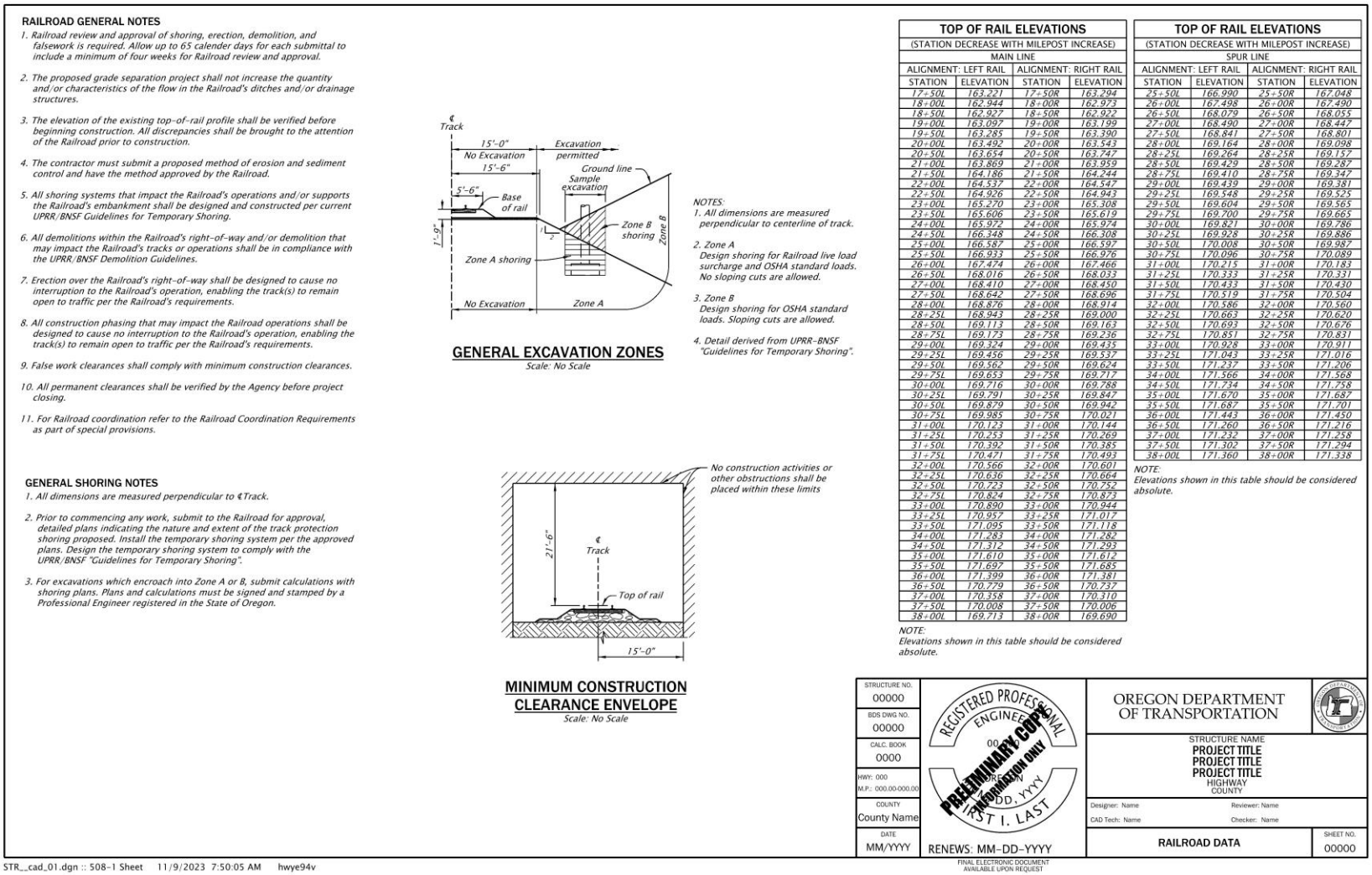
Section 508 Railroad Data

The railroad data sheet can vary from the example. The designer will get the data from the railroad in coordination with the ODOT State Utility and Rail Liaison.

Figure 508-1 Railroad Data



RAILROAD GENERAL NOTES

1. Railroad review and approval of shoring, erection, demolition, and falsework is required. Allow up to 65 calender days for each submittal to include a minimum of four weeks for Railroad review and approval.
2. The proposed grade separation project shall not increase the quantity and/or characteristics of the flow in the Railroad's ditches and/or drainage structures.
3. The elevation of the existing top-of-rail profile shall be verified before beginning construction. All discrepancies shall be brought to the attention of the Railroad prior to construction.
4. The contractor must submit a proposed method of erosion and sediment control and have the method approved by the Railroad.
5. All shoring systems that impact the Railroad's operations and/or supports the Railroad's embankment shall be designed and constructed per current UPRR/BNSF Guidelines for Temporary Shoring.
6. All demolitions within the Railroad's right-of-way and/or demolition that may impact the Railroad's tracks or operations shall be in compliance with the UPRR/BNSF Demolition Guidelines.
7. Erection over the Railroad's right-of-way shall be designed to cause no interruption to the Railroad's operation, enabling the track(s) to remain open to traffic per the Railroad's requirements.
8. All construction phasing that may impact the Railroad operations shall be designed to cause no interruption to the Railroad's operation, enabling the track(s) to remain open to traffic per the Railroad's requirements.
9. False work clearances shall comply with minimum construction clearances.
10. All permanent clearances shall be verified by the Agency before project closing.
11. For Railroad coordination refer to the Railroad Coordination Requirements as part of special provisions.

GENERAL SHORING NOTES

1. All dimensions are measured perpendicular to ℄Track.
2. Prior to commencing any work, submit to the Railroad for approval, detailed plans indicating the nature and extent of the track protection shoring proposed. Install the temporary shoring system per the approved plans. Design the temporary shoring system to comply with the UPRR/BNSF "Guidelines for Temporary Shoring".
3. For excavations which encroach into Zone A or B, submit calculations with shoring plans. Plans and calculations must be signed and stamped by a Professional Engineer registered in the State of Oregon.

GENERAL EXCAVATION ZONES
Scale: No Scale

NOTES:
1. All dimensions are measured perpendicular to centerline of track.
2. Zone A
   Design shoring for Railroad live load surcharge and OSHA standard loads. No sloping cuts are allowed.
3. Zone B
   Design shoring for OSHA standard loads. Sloping cuts are allowed.
4. Detail derived from UPRR-BNSF "Guidelines for Temporary Shoring".

MINIMUM CONSTRUCTION CLEARANCE ENVELOPE
Scale: No Scale

TOP OF RAIL ELEVATIONS
(STATION DECREASE WITH MILEPOST INCREASE)
MAIN LINE

ALIGNMENT: LEFT RAIL		ALIGNMENT: RIGHT RAIL	
STATION	ELEVATION	STATION	ELEVATION
17+50L	163.221	17+50R	163.294
18+00L	162.944	18+00R	162.973
18+50L	162.927	18+50R	162.922
19+00L	163.097	19+00R	163.199
19+50L	163.285	19+50R	163.390
20+00L	163.492	20+00R	163.543
20+50L	163.654	20+50R	163.747
21+00L	163.869	21+00R	163.959
21+50L	164.186	21+50R	164.244
22+00L	164.537	22+00R	164.547
22+50L	164.926	22+50R	164.943
23+00L	165.270	23+00R	165.308
23+50L	165.606	23+50R	165.619
24+00L	165.972	24+00R	165.974
24+50L	166.348	24+50R	166.308
25+00L	166.587	25+00R	166.597
25+50L	166.933	25+50R	166.976
26+00L	167.474	26+00R	167.466
26+50L	168.016	26+50R	168.033
27+00L	168.410	27+00R	168.450
27+50L	168.642	27+50R	168.696
28+00L	168.876	28+00R	168.914
28+25L	168.943	28+25R	169.000
28+50L	169.113	28+50R	169.163
28+75L	169.173	28+75R	169.236
29+00L	169.324	29+00R	169.435
29+25L	169.456	29+25R	169.537
29+50L	169.562	29+50R	169.624
29+75L	169.653	29+75R	169.717
30+00L	169.716	30+00R	169.788
30+25L	169.791	30+25R	169.847
30+50L	169.879	30+50R	169.942
30+75L	169.985	30+75R	170.021
31+00L	170.123	31+00R	170.144
31+25L	170.253	31+25R	170.269
31+50L	170.392	31+50R	170.385
31+75L	170.471	31+75R	170.493
32+00L	170.566	32+00R	170.601
32+25L	170.636	32+25R	170.664
32+50L	170.723	32+50R	170.752
32+75L	170.824	32+75R	170.873
33+00L	170.890	33+00R	170.944
33+25L	170.957	33+25R	171.017
33+50L	171.095	33+50R	171.118
34+00L	171.283	34+00R	171.282
34+50L	171.312	34+50R	171.293
35+00L	171.610	35+00R	171.612
35+50L	171.697	35+50R	171.685
36+00L	171.399	36+00R	171.381
36+50L	170.779	36+50R	170.737
37+00L	170.358	37+00R	170.310
37+50L	170.008	37+50R	170.006
38+00L	169.713	38+00R	169.690

NOTE:
Elevations shown in this table should be considered absolute.

TOP OF RAIL ELEVATIONS
(STATION DECREASE WITH MILEPOST INCREASE)
SPUR LINE

ALIGNMENT: LEFT RAIL		ALIGNMENT: RIGHT RAIL	
STATION	ELEVATION	STATION	ELEVATION
25+50L	166.990	25+50R	167.048
26+00L	167.498	26+00R	167.490
26+50L	168.079	26+50R	168.055
27+00L	168.490	27+00R	168.447
27+50L	168.841	27+50R	168.801
28+00L	169.164	28+00R	169.098
28+25L	169.264	28+25R	169.157
28+50L	169.429	28+50R	169.287
28+75L	169.410	28+75R	169.347
29+00L	169.439	29+00R	169.381
29+25L	169.548	29+25R	169.525
29+50L	169.604	29+50R	169.565
29+75L	169.700	29+75R	169.665
30+00L	169.821	30+00R	169.786
30+25L	169.928	30+25R	169.886
30+50L	170.008	30+50R	169.987
30+75L	170.096	30+75R	170.089
31+00L	170.215	31+00R	170.183
31+25L	170.333	31+25R	170.331
31+50L	170.433	31+50R	170.430
31+75L	170.519	31+75R	170.504
32+00L	170.586	32+00R	170.560
32+25L	170.663	32+25R	170.620
32+50L	170.693	32+50R	170.676
32+75L	170.851	32+75R	170.831
33+00L	170.928	33+00R	170.911
33+25L	171.043	33+25R	171.016
33+50L	171.237	33+50R	171.206
34+00L	171.566	34+00R	171.568
34+50L	171.734	34+50R	171.758
35+00L	171.670	35+00R	171.687
35+50L	171.687	35+50R	171.701
36+00L	171.443	36+00R	171.450
36+50L	171.260	36+50R	171.216
37+00L	171.232	37+00R	171.258
37+50L	171.302	37+50R	171.294
38+00L	171.360	38+00R	171.338

NOTE:
Elevations shown in this table should be considered absolute.

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COUNTY	County Name
DATE	MM/YYYY

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FINAL ELECTRONIC DOCUMENT AVAILABLE UPON REQUEST

OREGON DEPARTMENT OF TRANSPORTATION

STRUCTURE NAME
PROJECT TITLE
PROJECT TITLE
PROJECT TITLE
HIGHWAY
COUNTY

Designer: Name Reviewer: Name
CAD Tech: Name Checker: Name

RAILROAD DATA

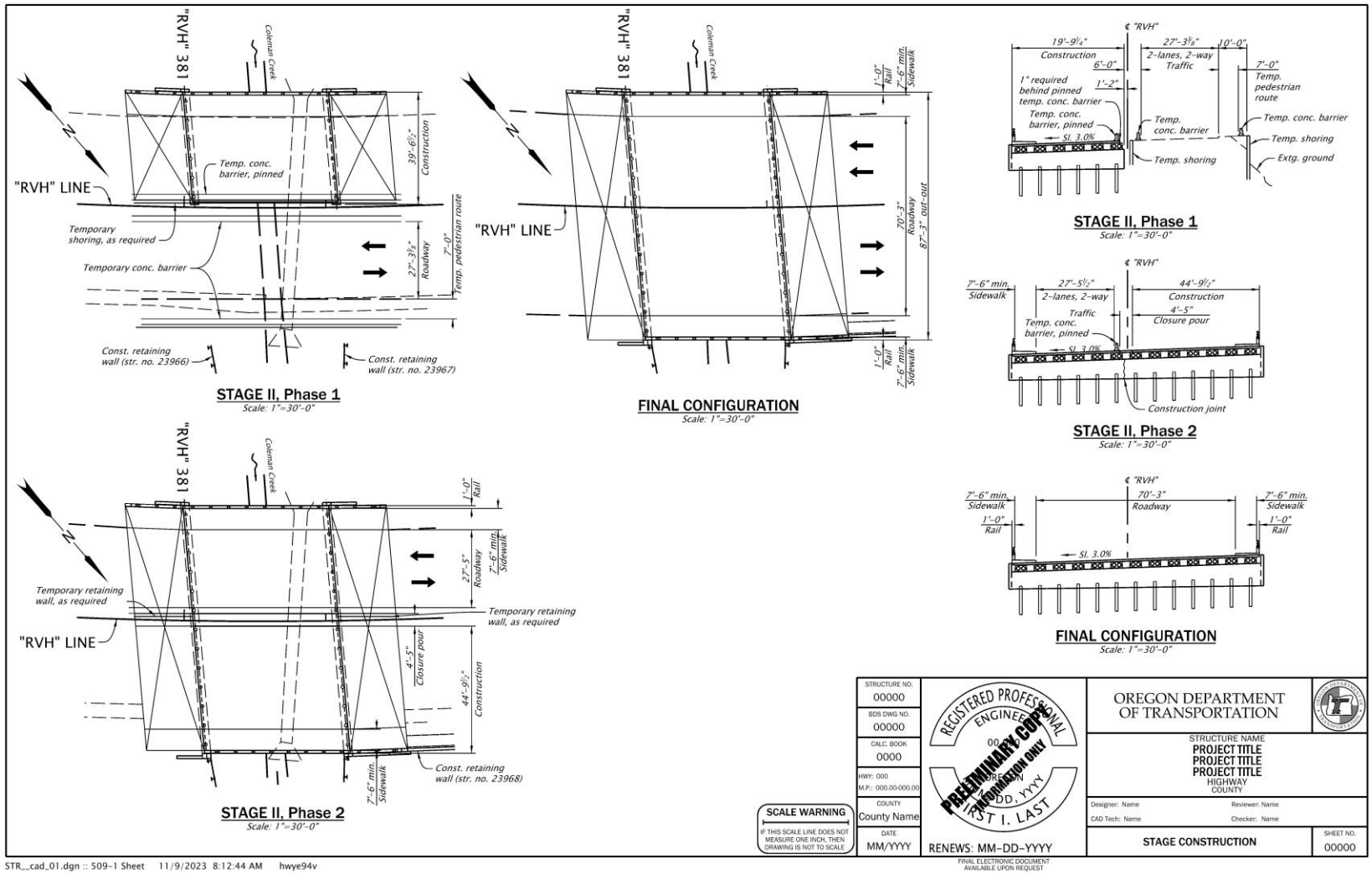
SHEET NO. 00000

STR_cad_01.dgn :: 508-1 Sheet 11/9/2023 7:50:05 AM hwye94v

Section 509 Stage Construction

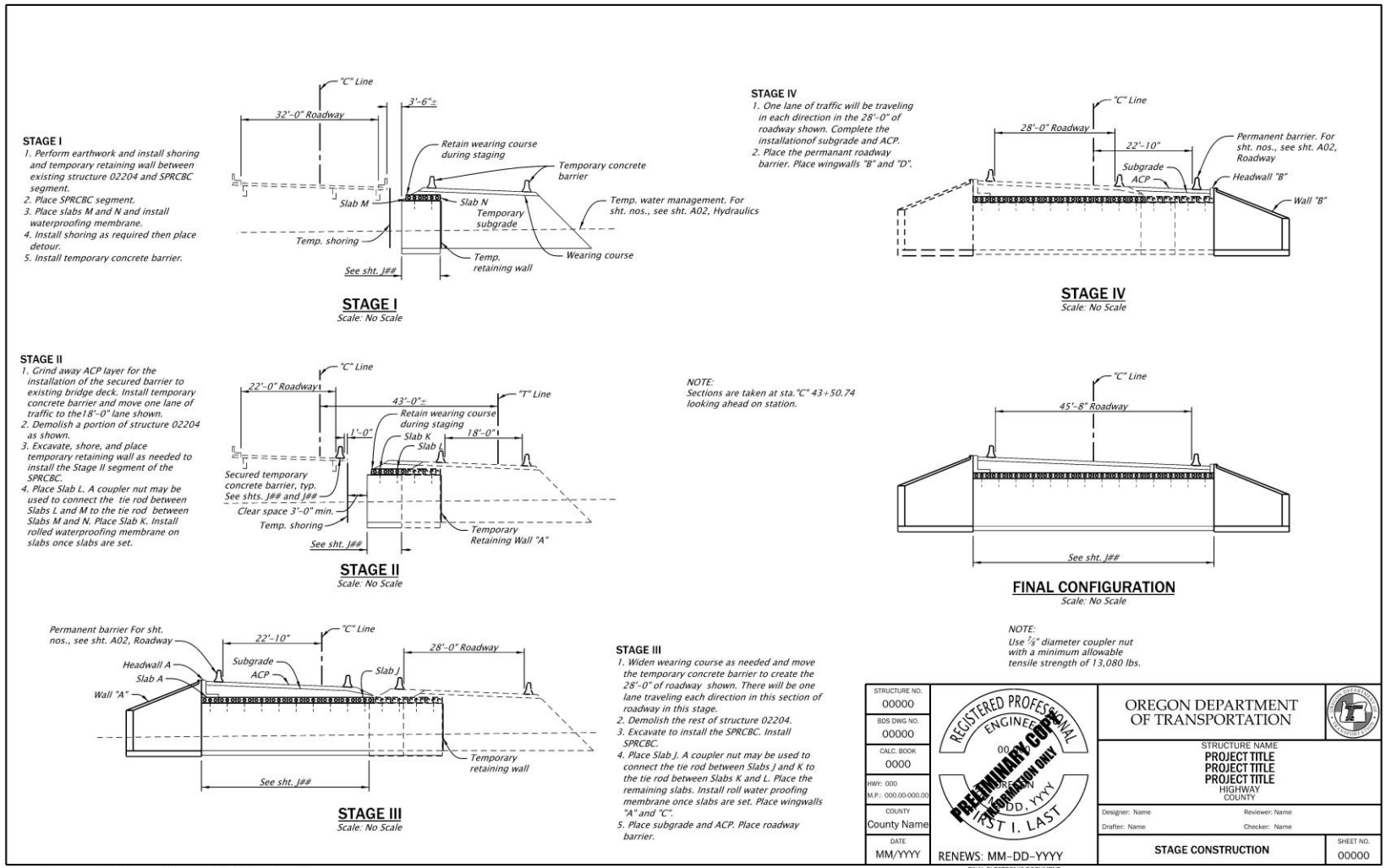
Stage construction may be shown in cross section or plan view or both, as required.

100 Figure 509-1 Stage Construction Plan and Sections



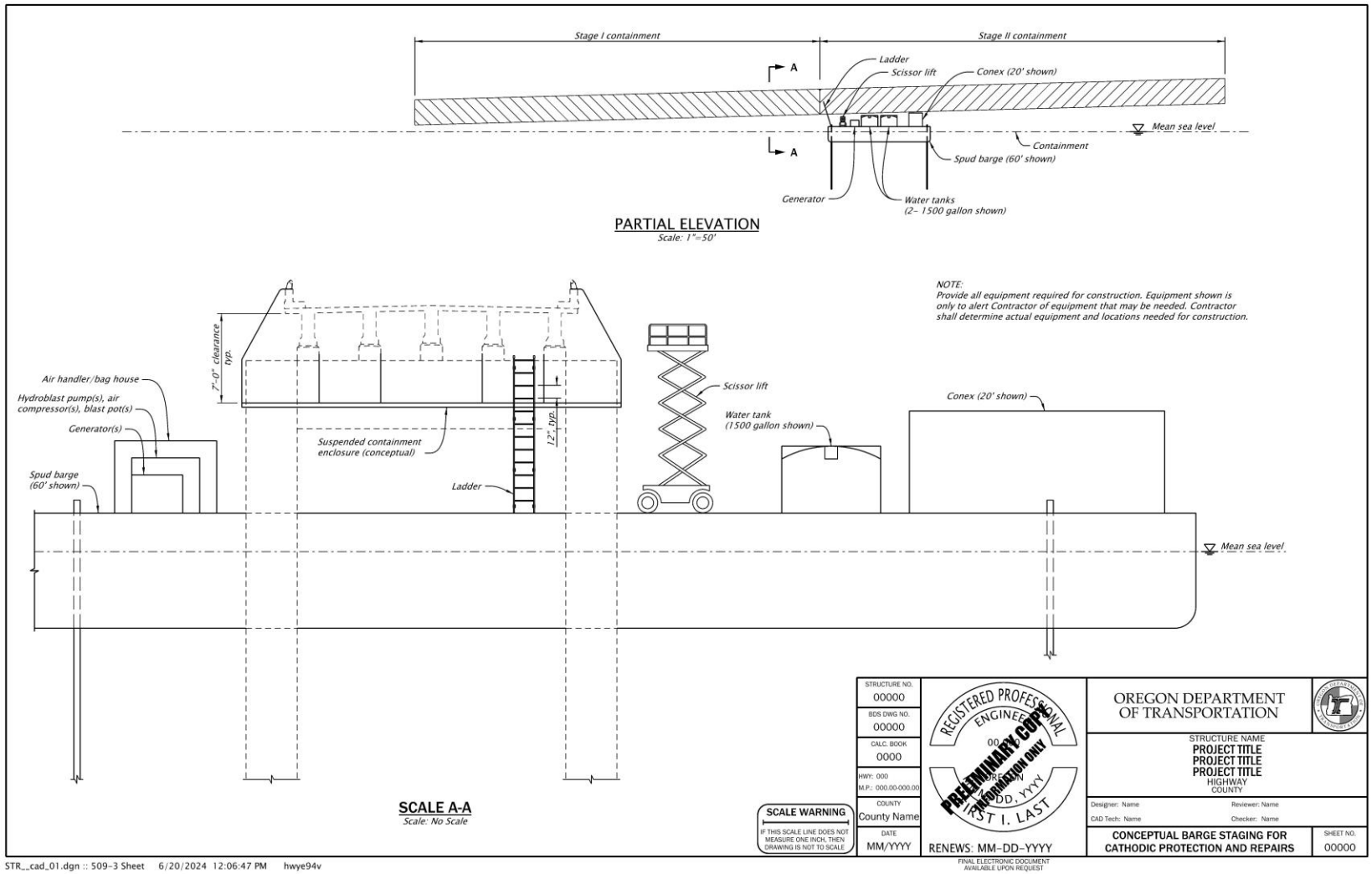
101

102 Figure 509-2 Stage Construction Sections



103

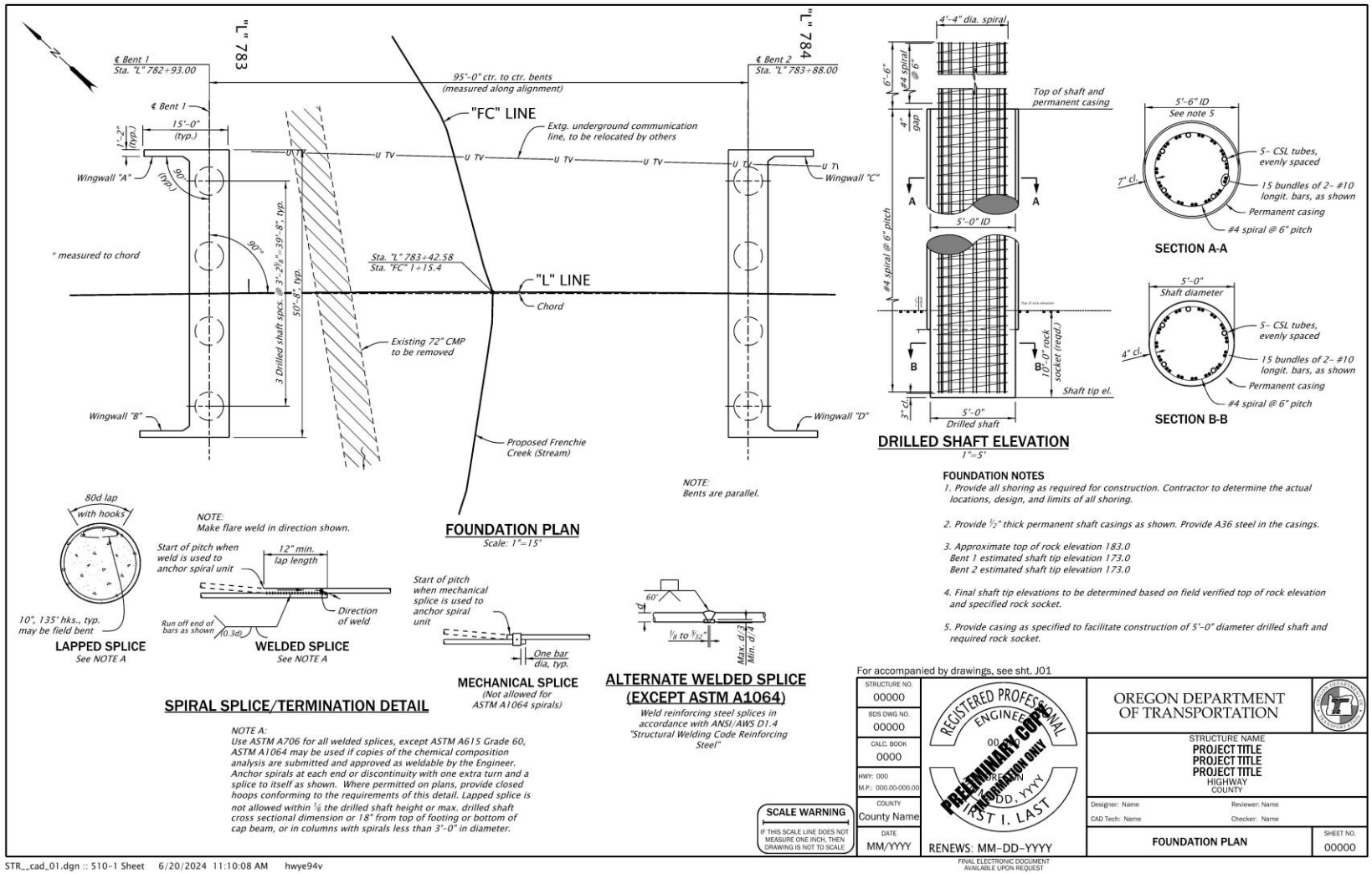
104 Figure 509-3 Stage Construction Preservation Plan Details



105

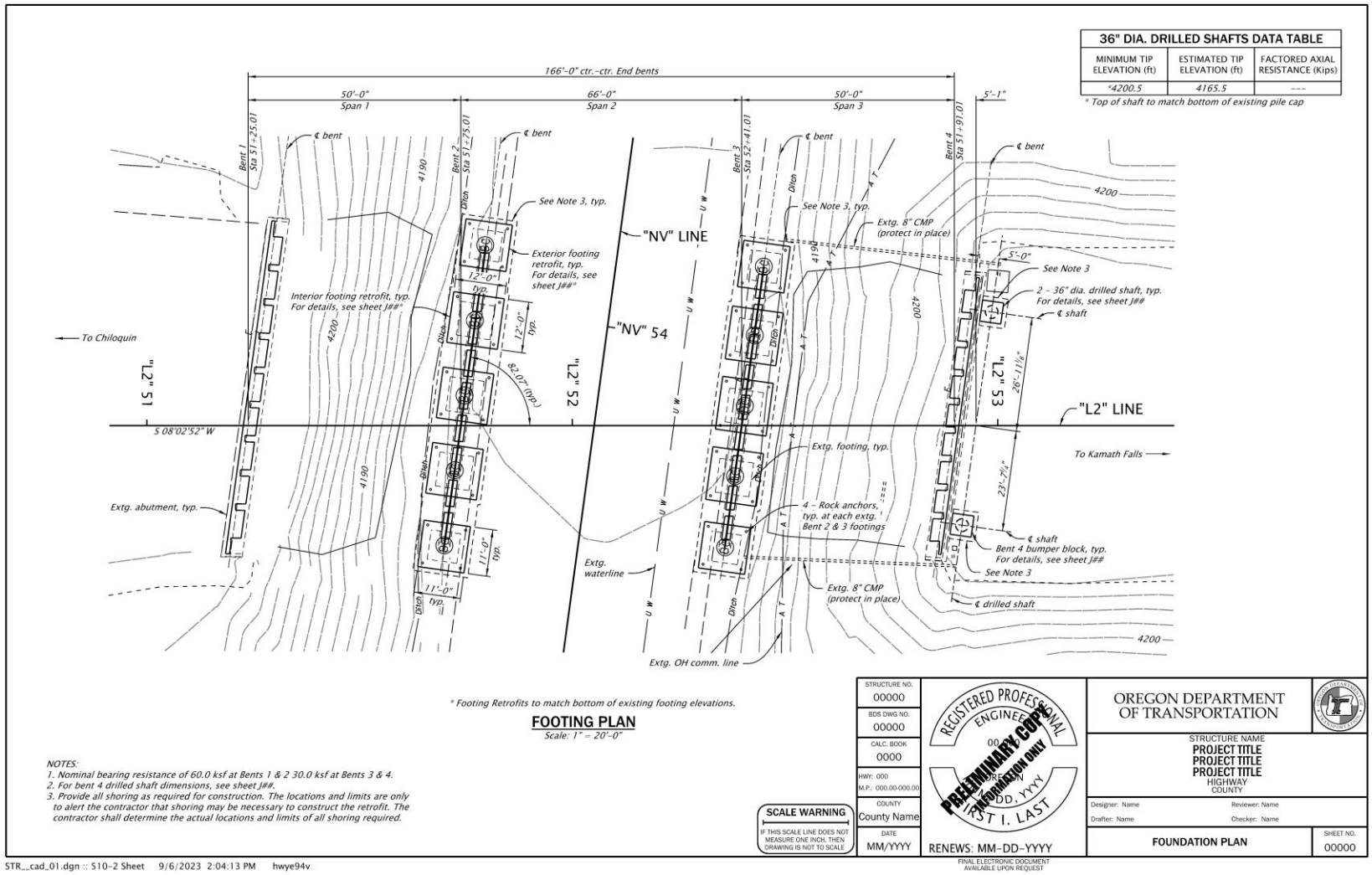
106 # Section 510 Foundation

107 Figure 510-1 Foundation Plan with Drilled Shafts

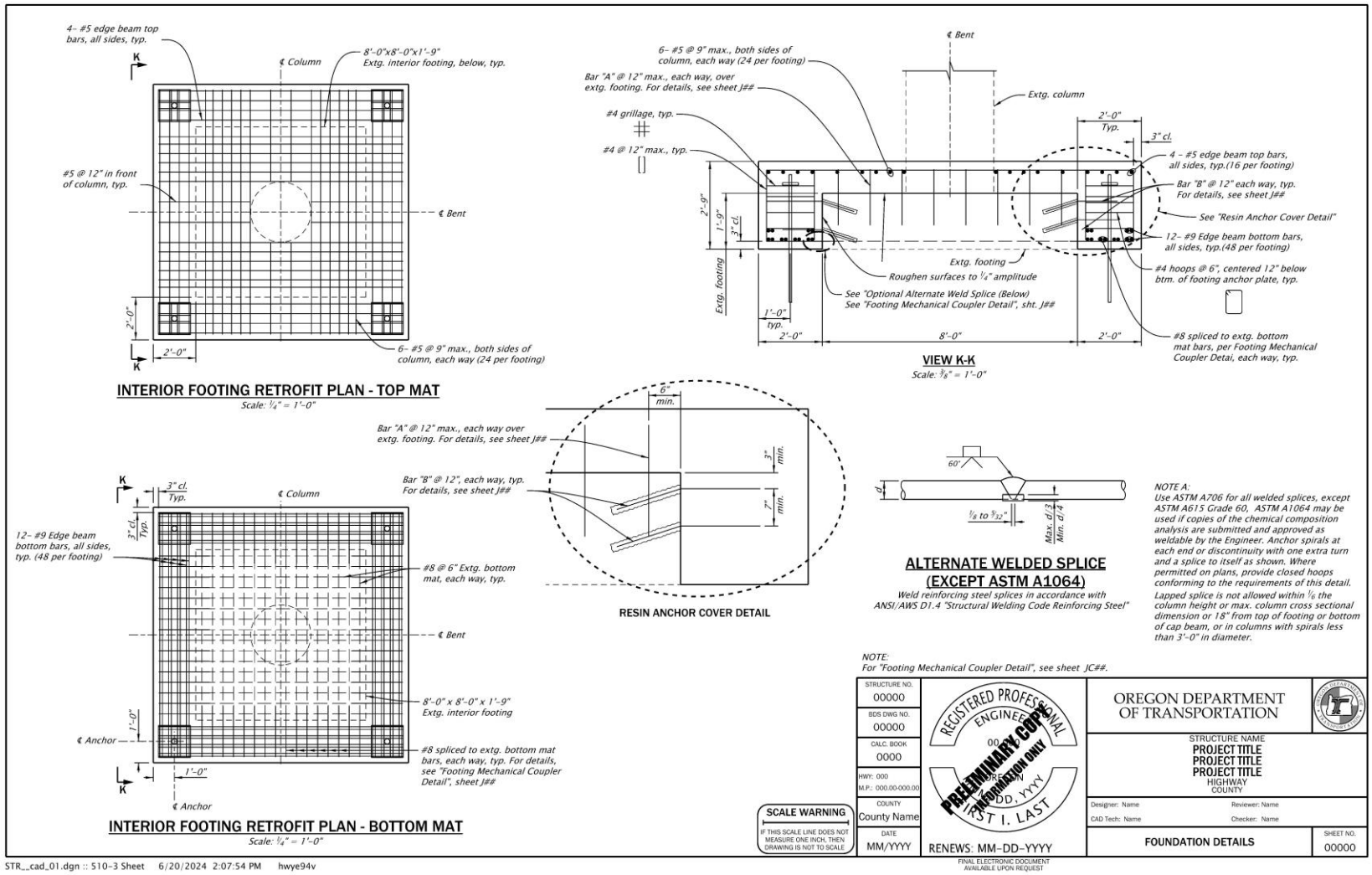


108

Figure 510-2 Foundation Plan with Footings

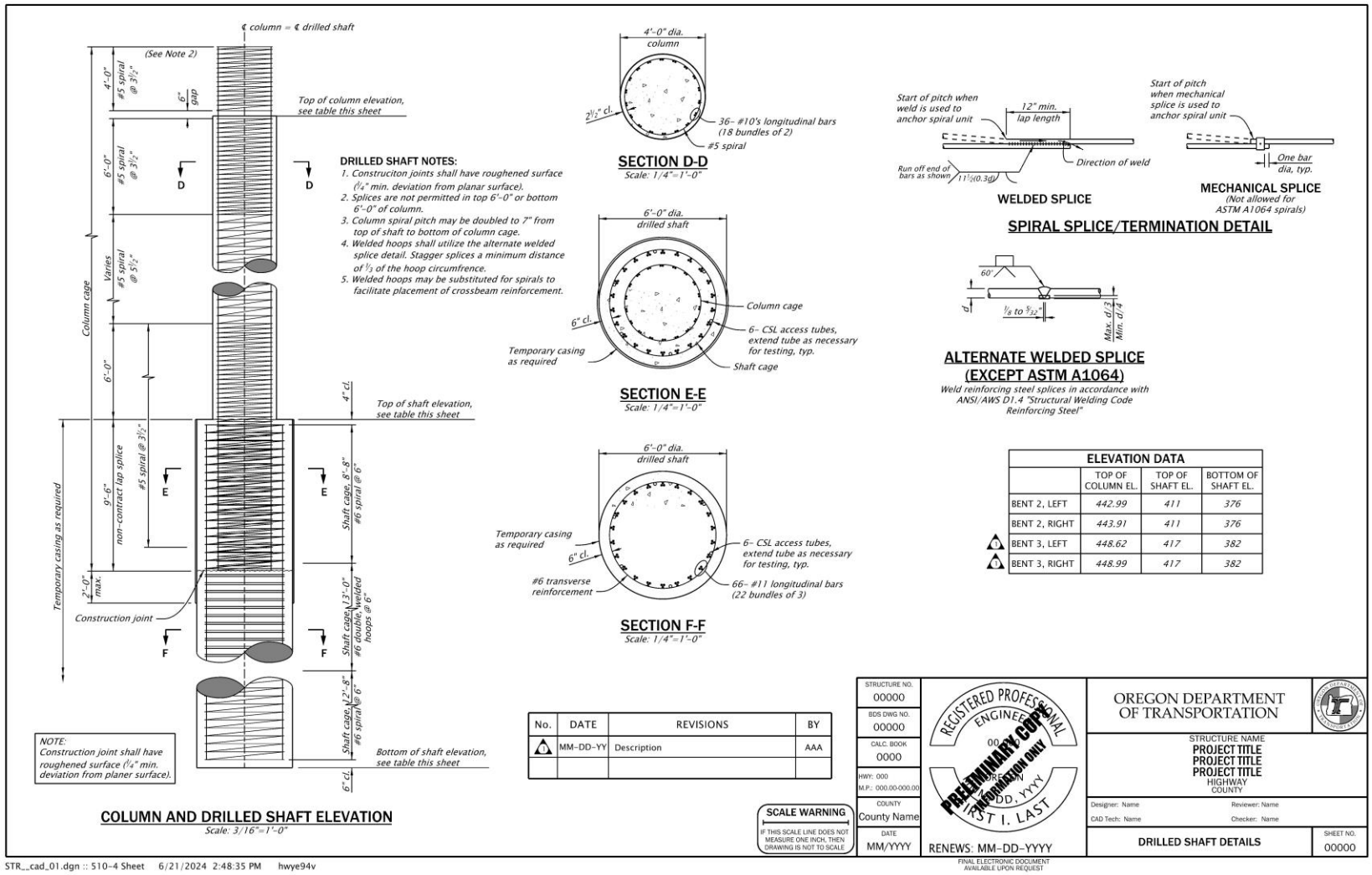


111 Figure 510-3 Foundation Details



112

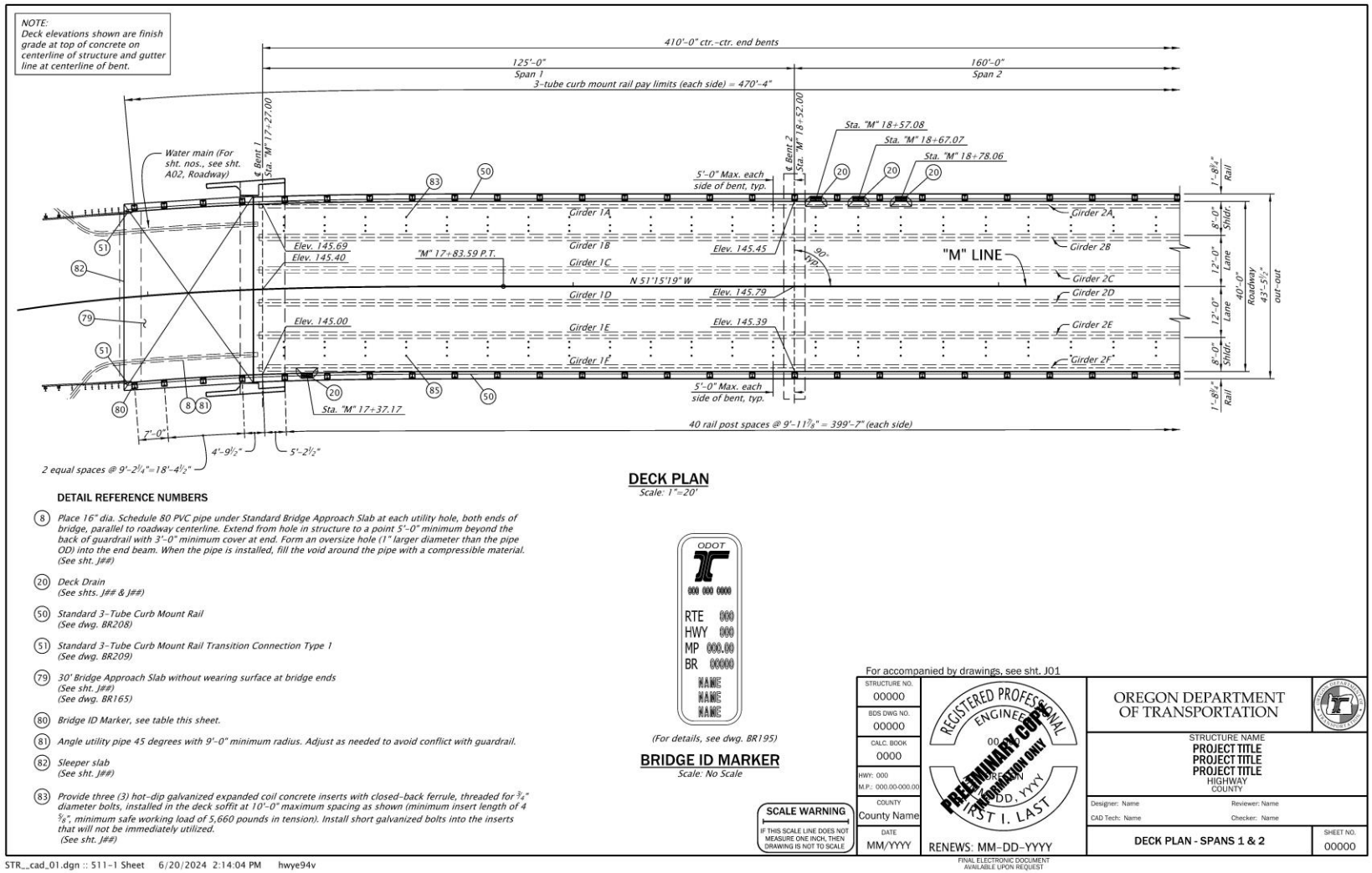
113 Figure 510-4 Drilled Shaft Details



114

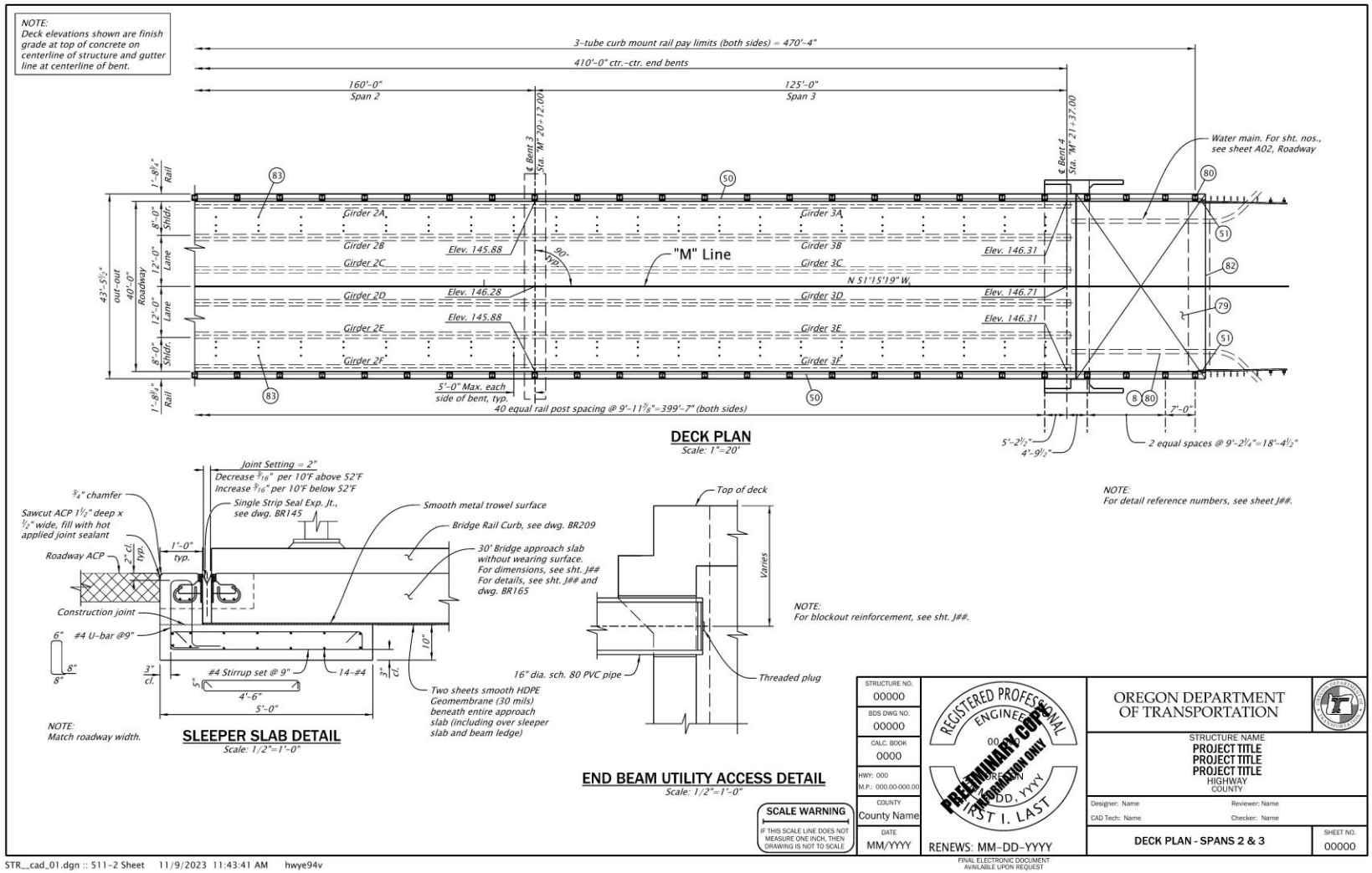
115 Section 511 Superstructure

116 Figure 511-1 Deck Plan - Spans 1 and 2



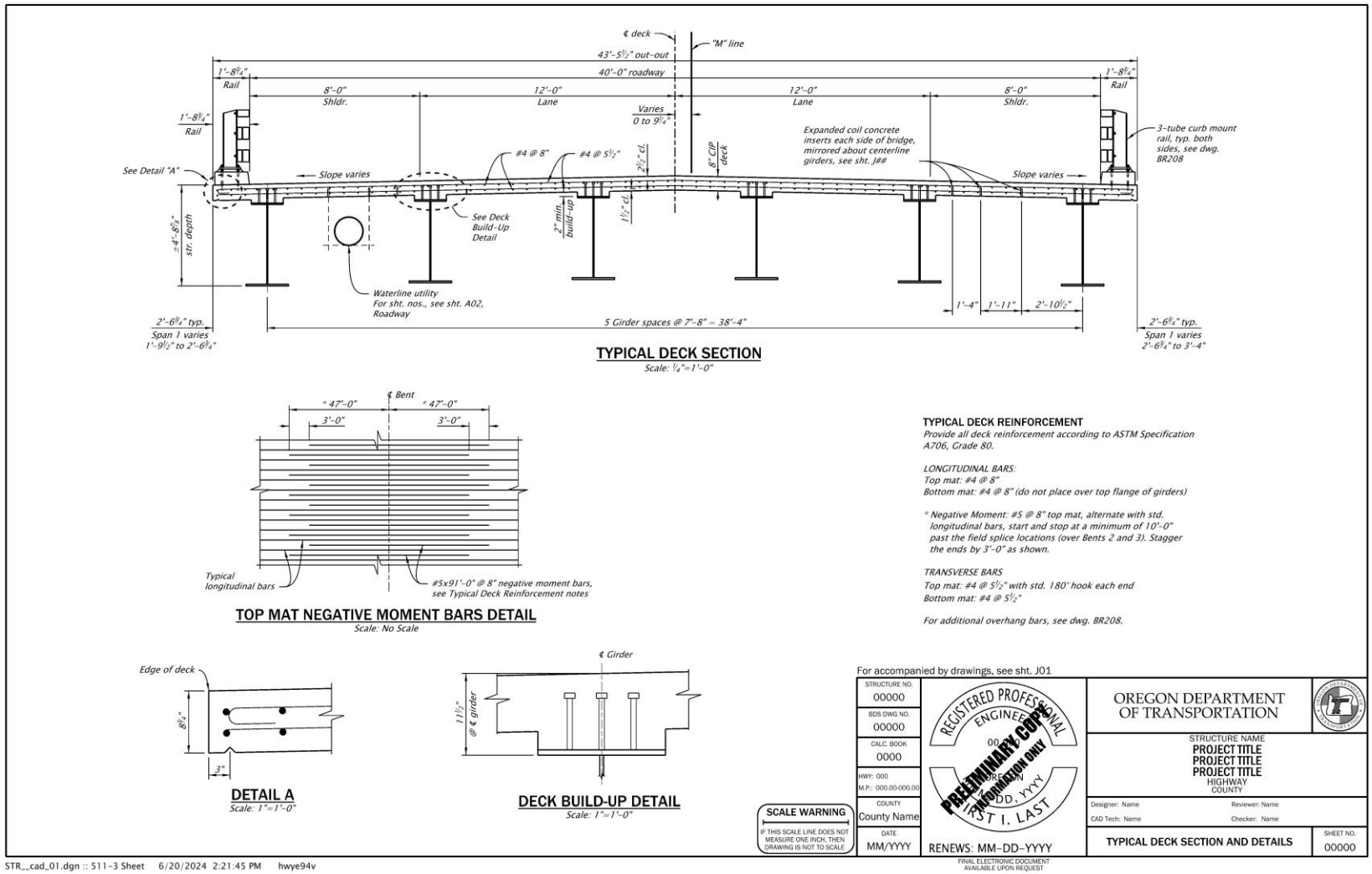
117

118 Figure 511-2 Deck Plan - Spans 2 and 3



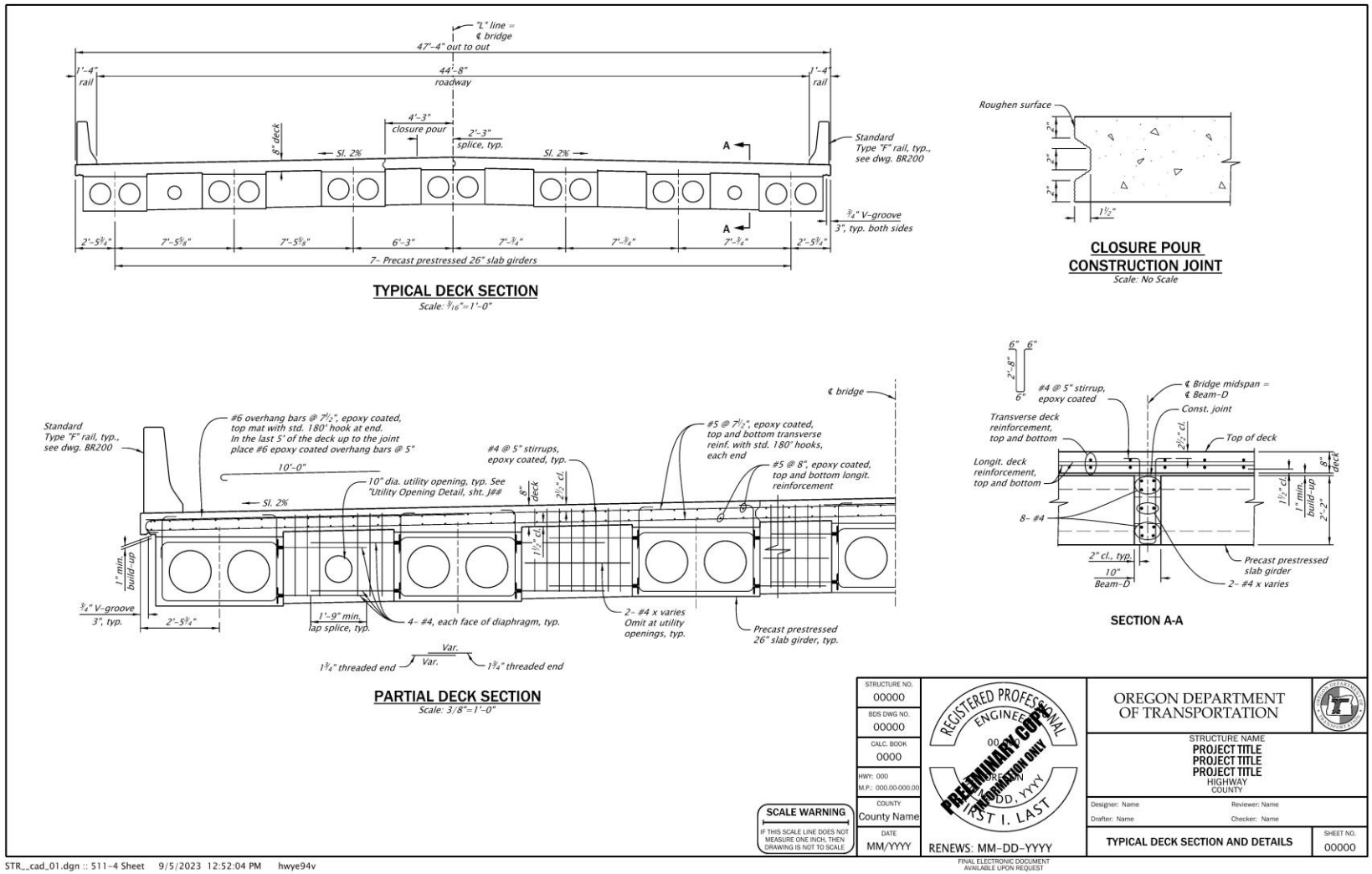
119

120 Figure 511-3 Typical Steel Girder Deck Section and Details



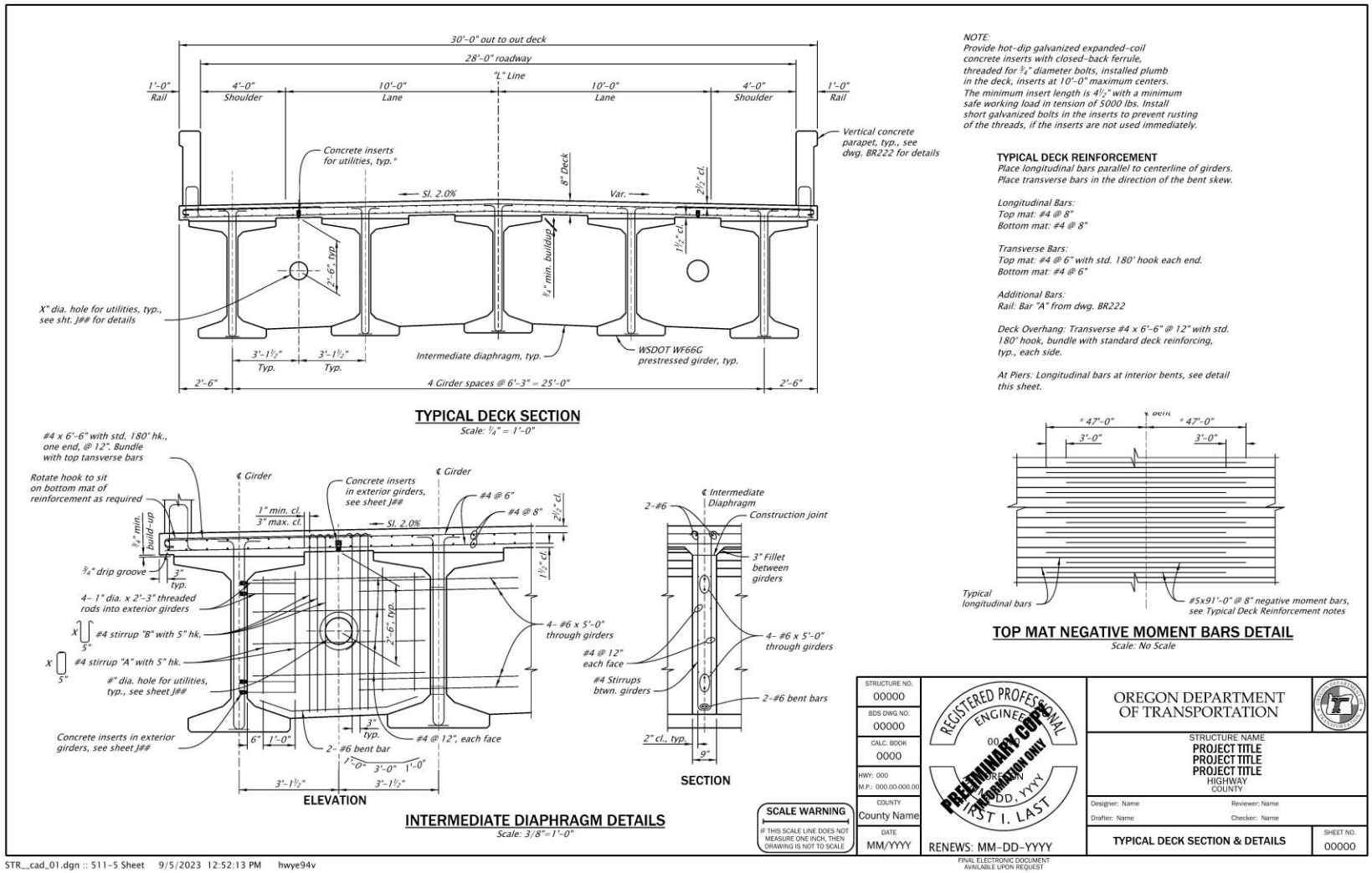
121

122 Figure 511-4 Typical Deck Section - Slabs



123

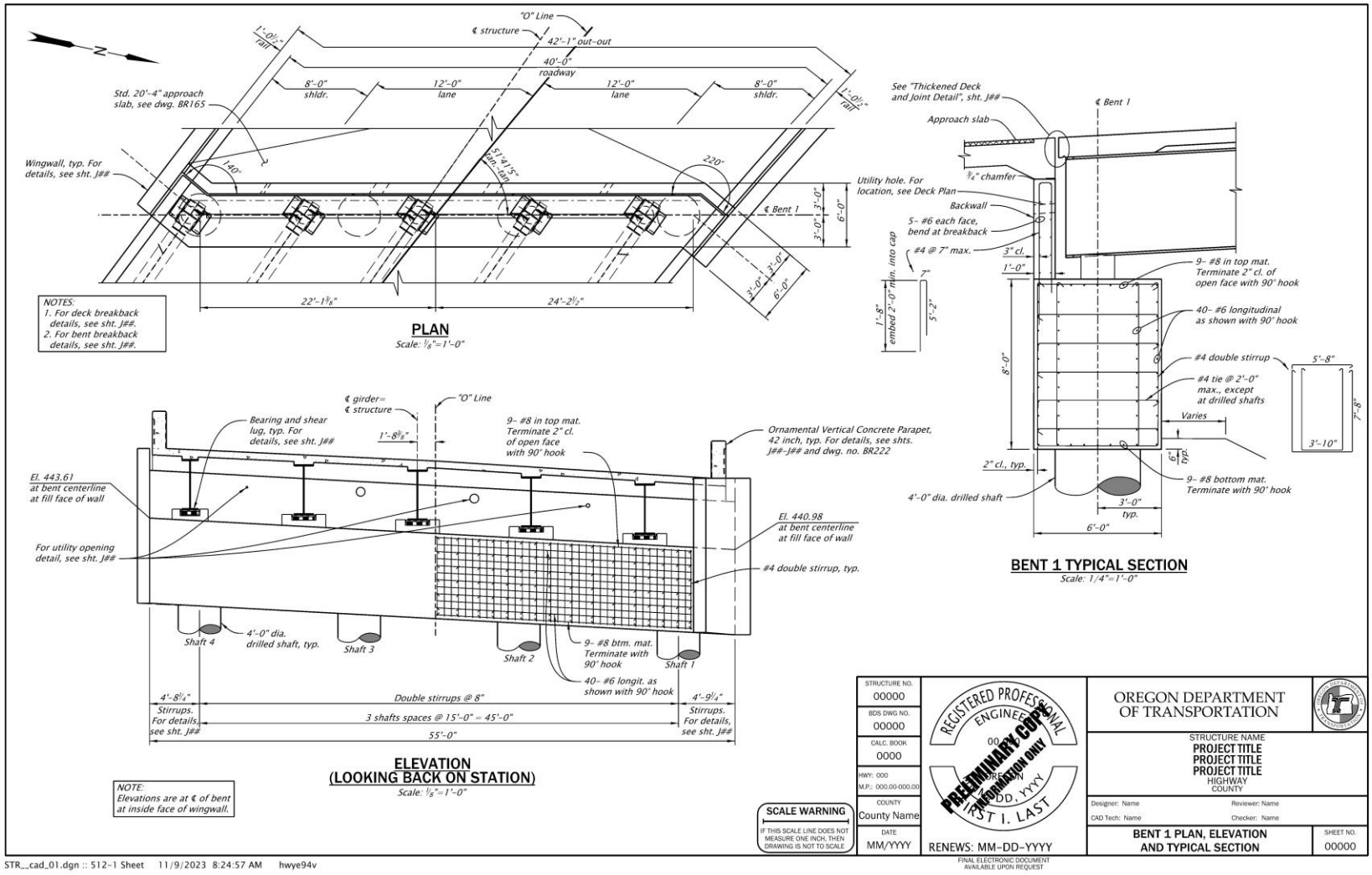
124 Figure 511-5 Typical Deck Section - Concrete Girders



125

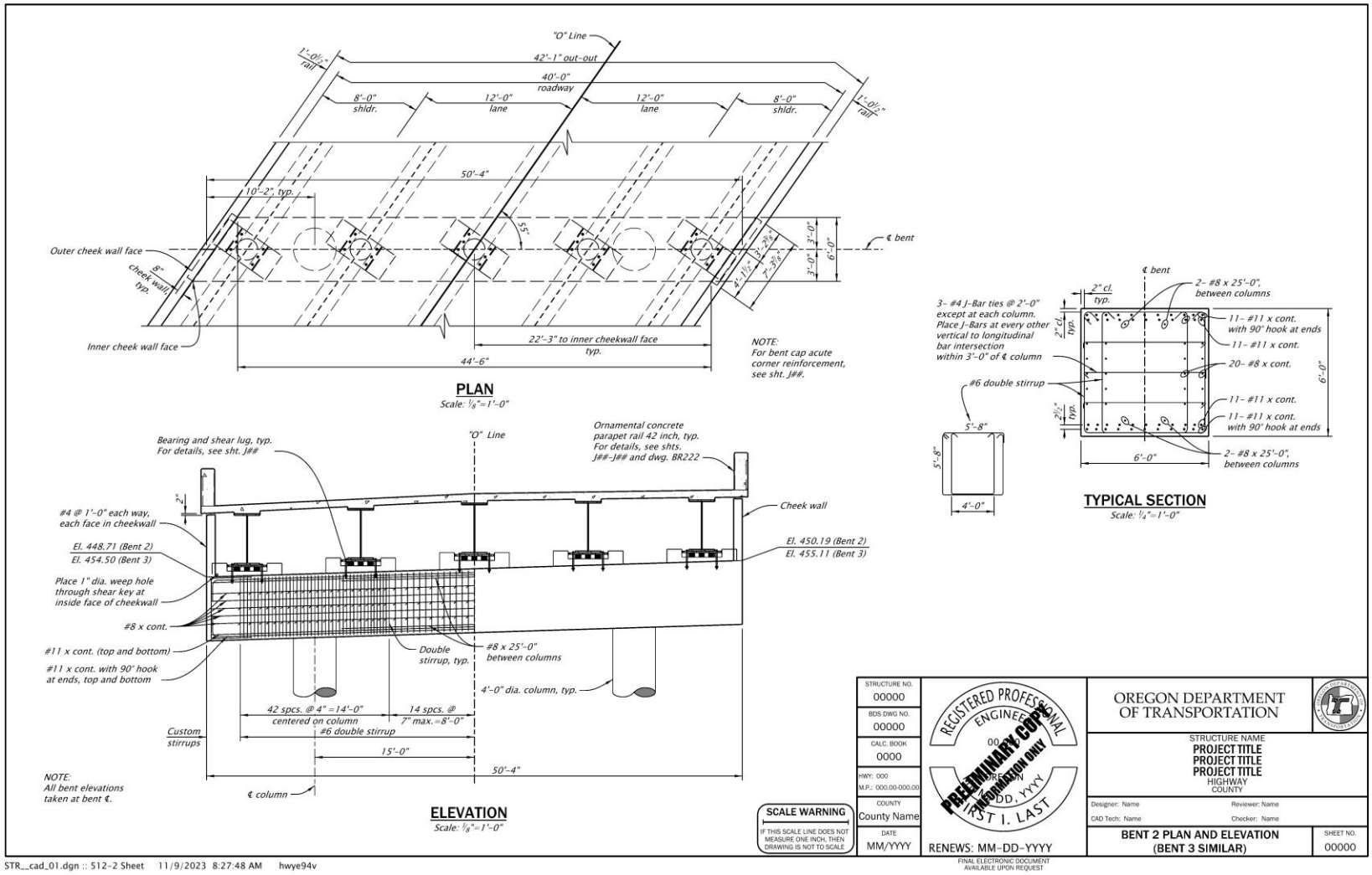
Section 512 Substructure

128 Figure 512-1 End Bent Plan and Elevation



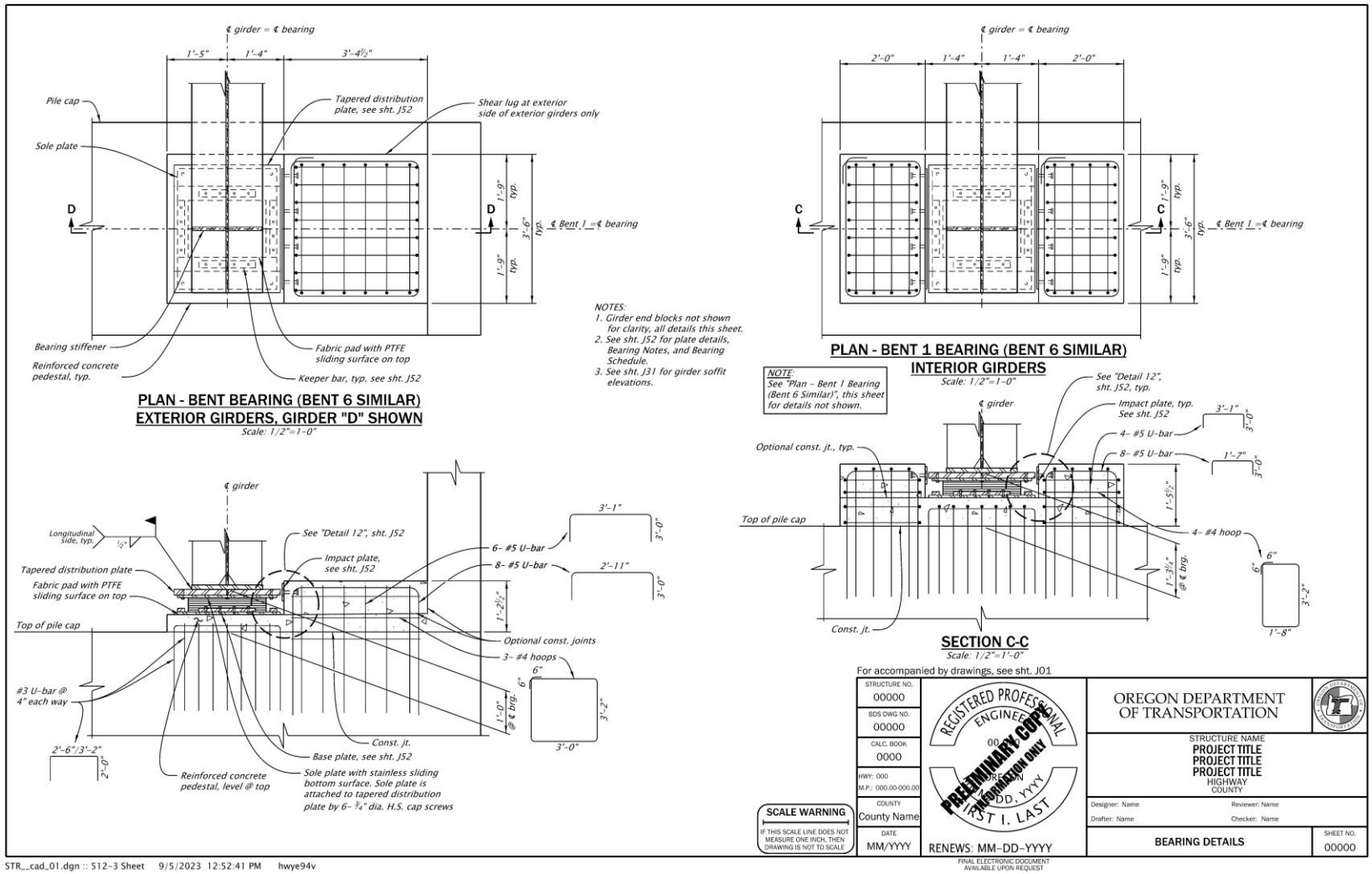
129

130 Figure 512-2 Interior Bent Plan and Elevation



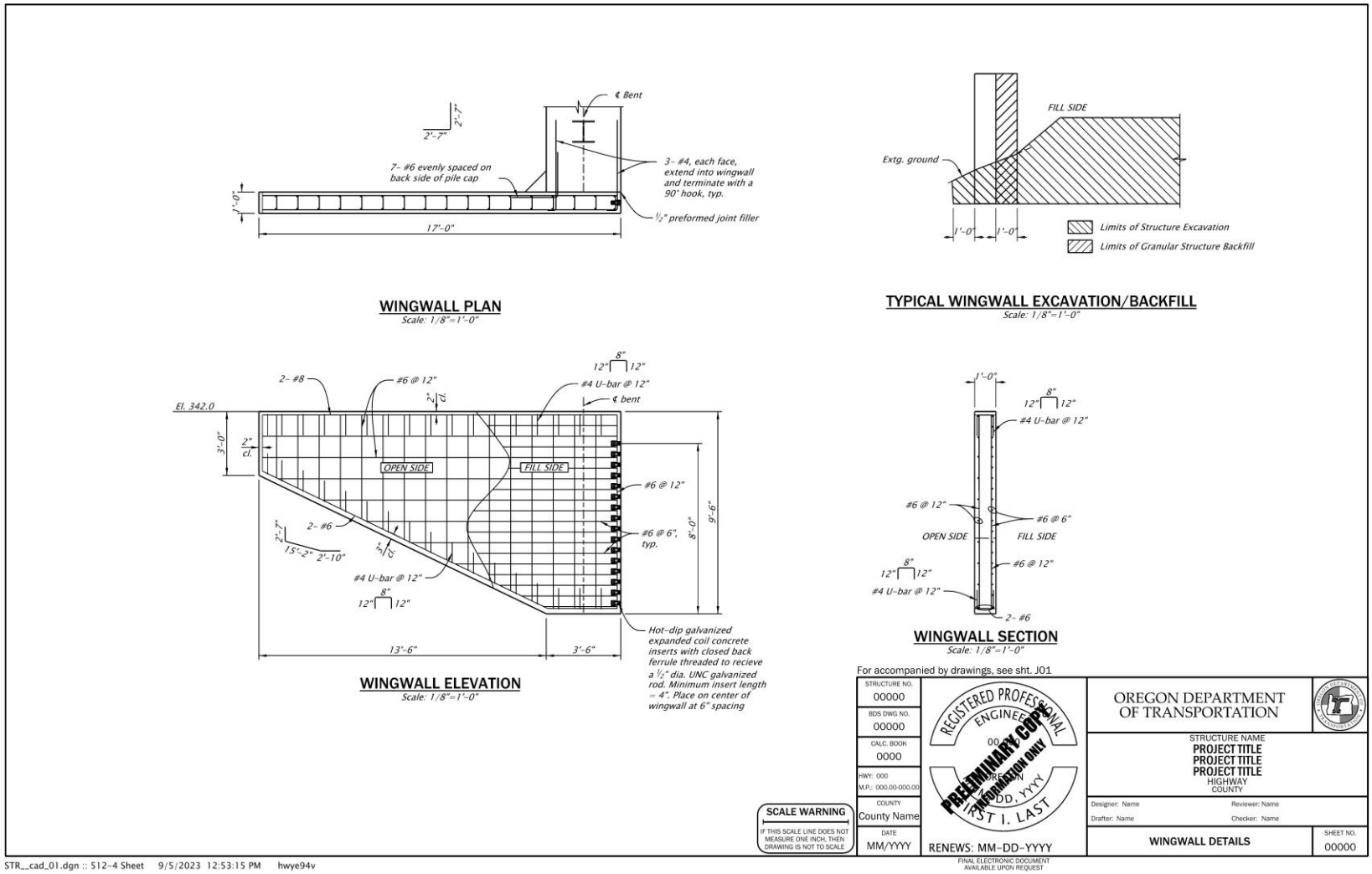
131

132 Figure 512-3 Bearing and Shear Lug Details



133

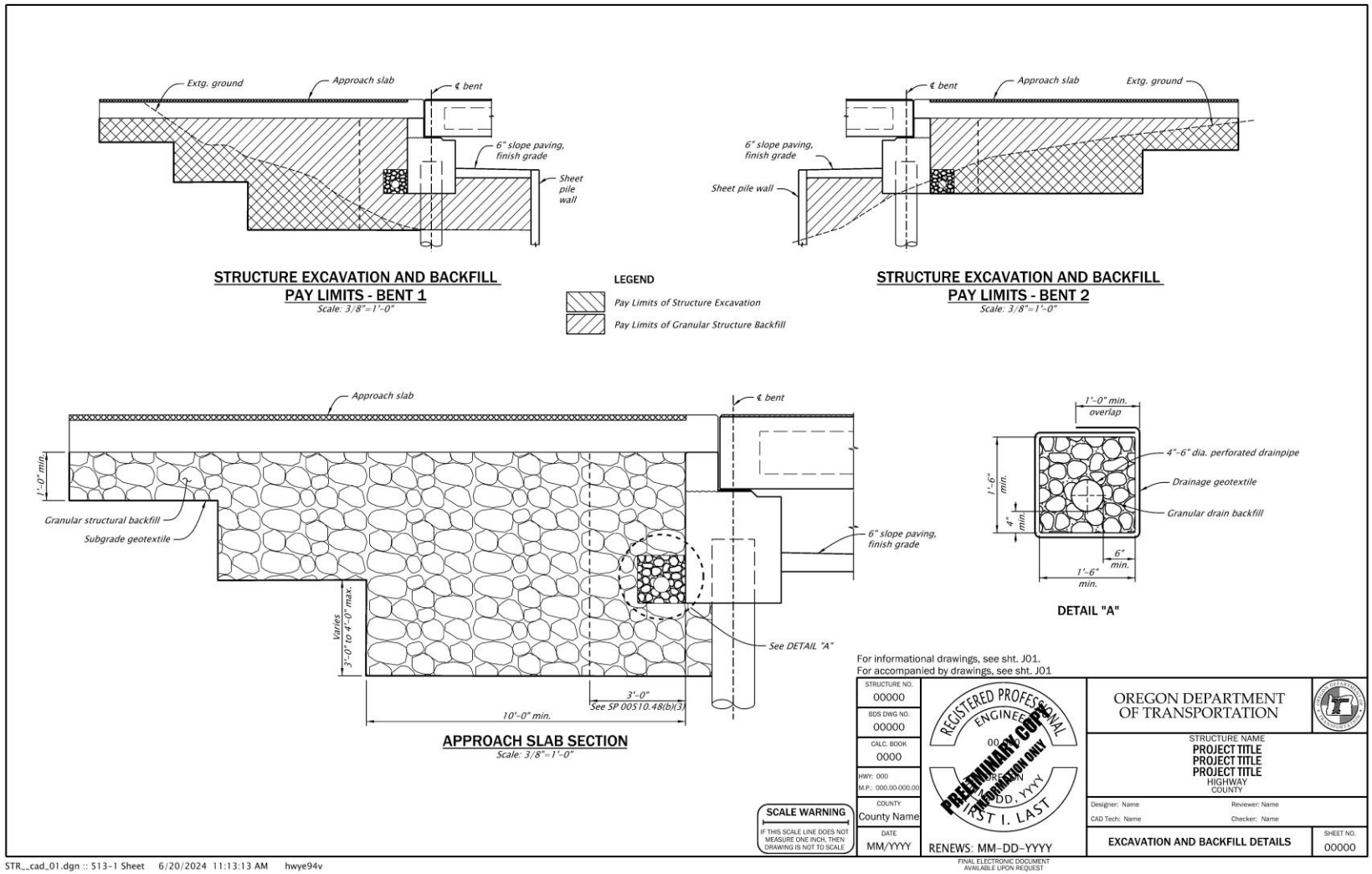
134 Figure 512-4 Wingwall Details



135

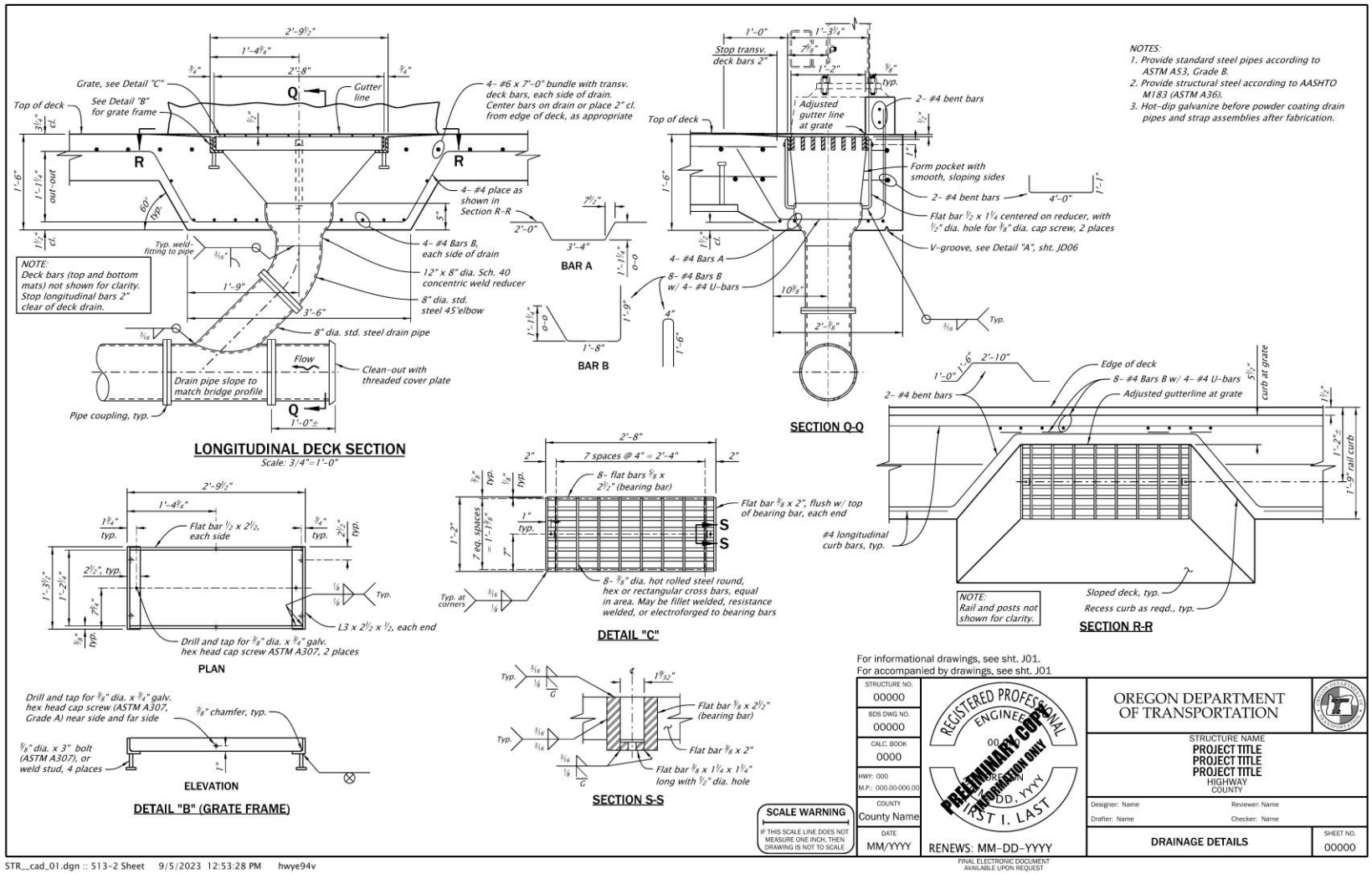
136 # Section 513 Miscellaneous Details

137 Figure 513-1 Excavation and Backfill Details

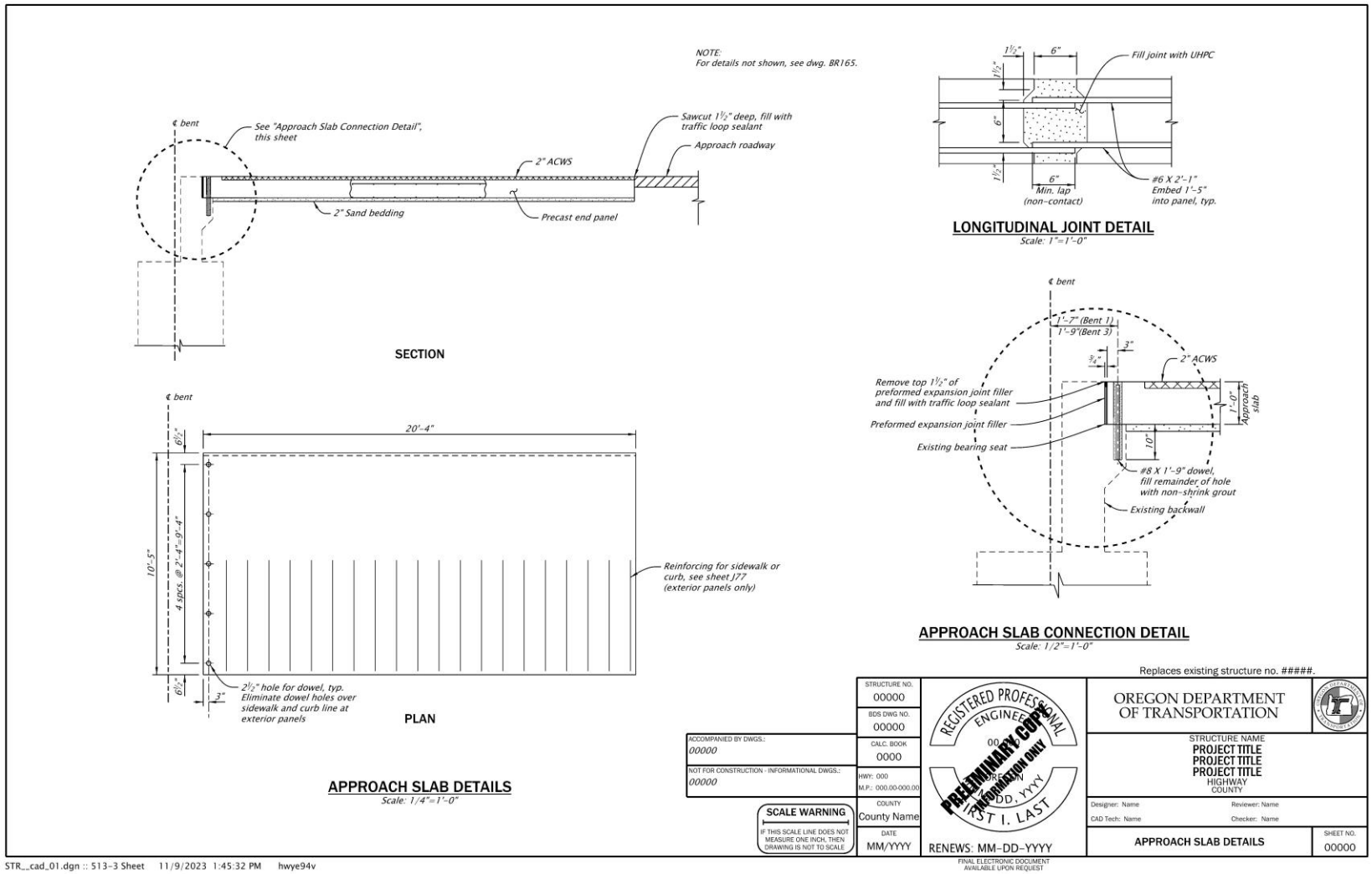


138

Figure 513-2 Drainage Details

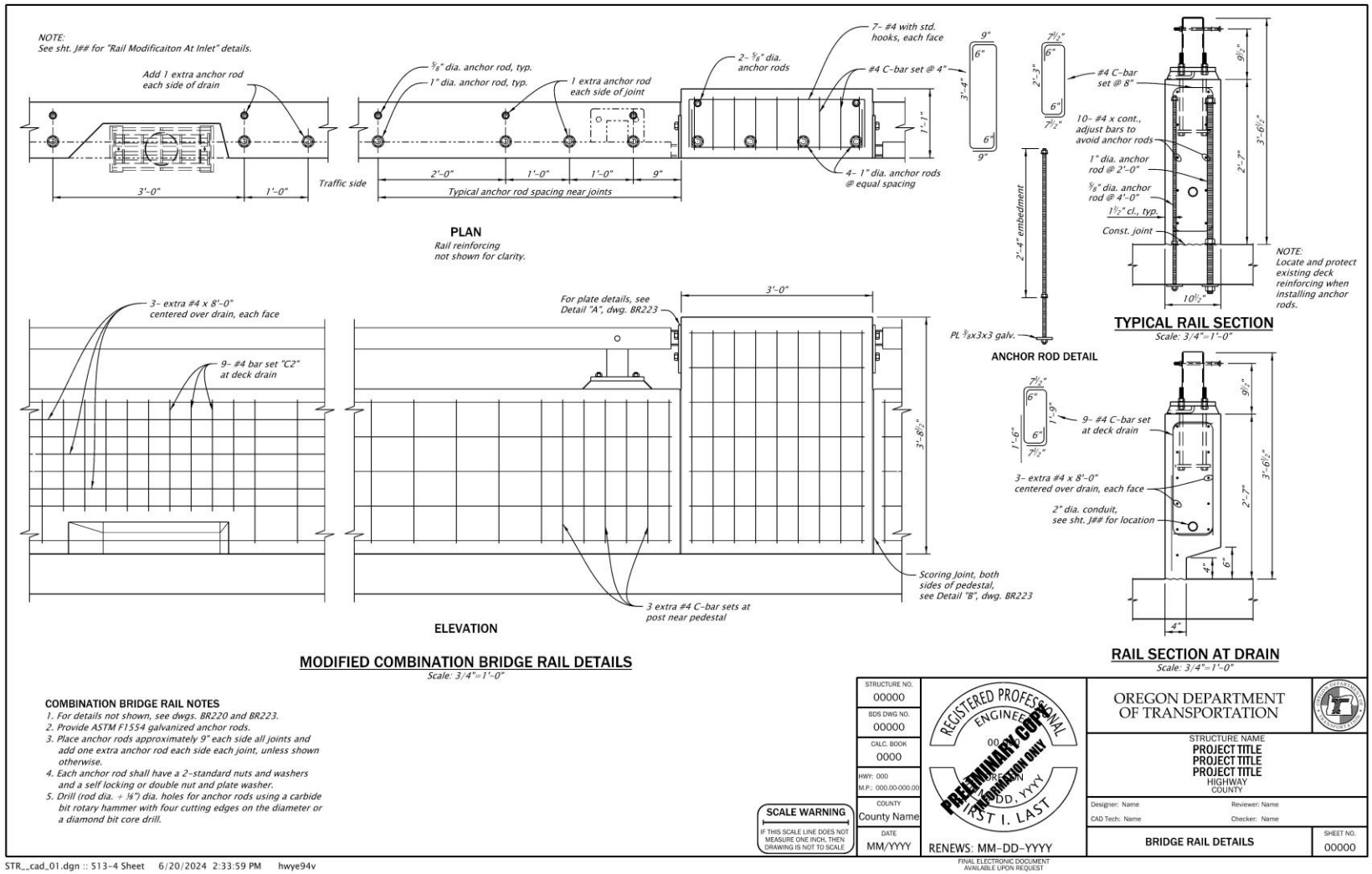


141 Figure 513-3 Approach Slab Details



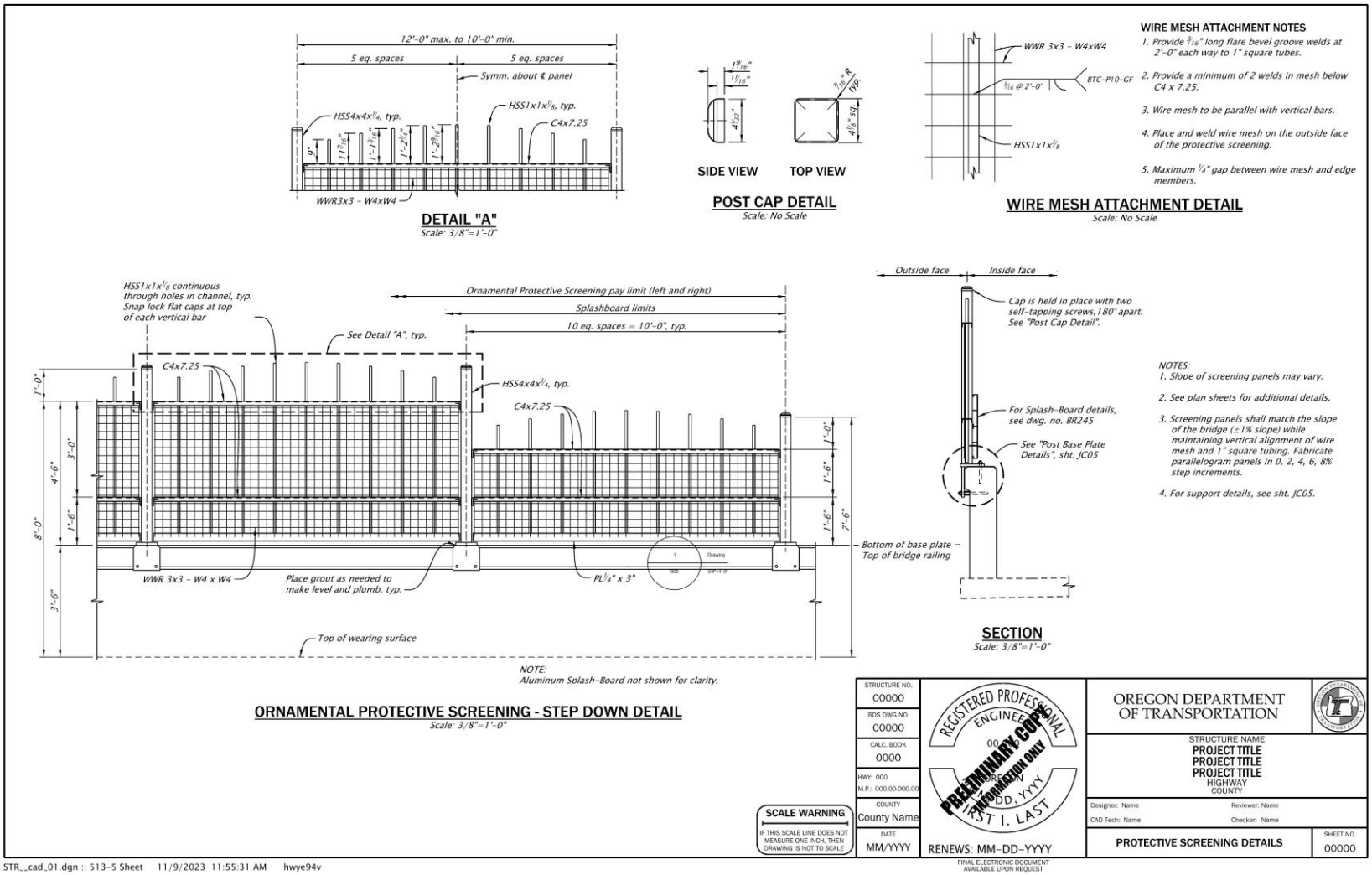
142

143 Figure 513-4 Bridge Rail Details

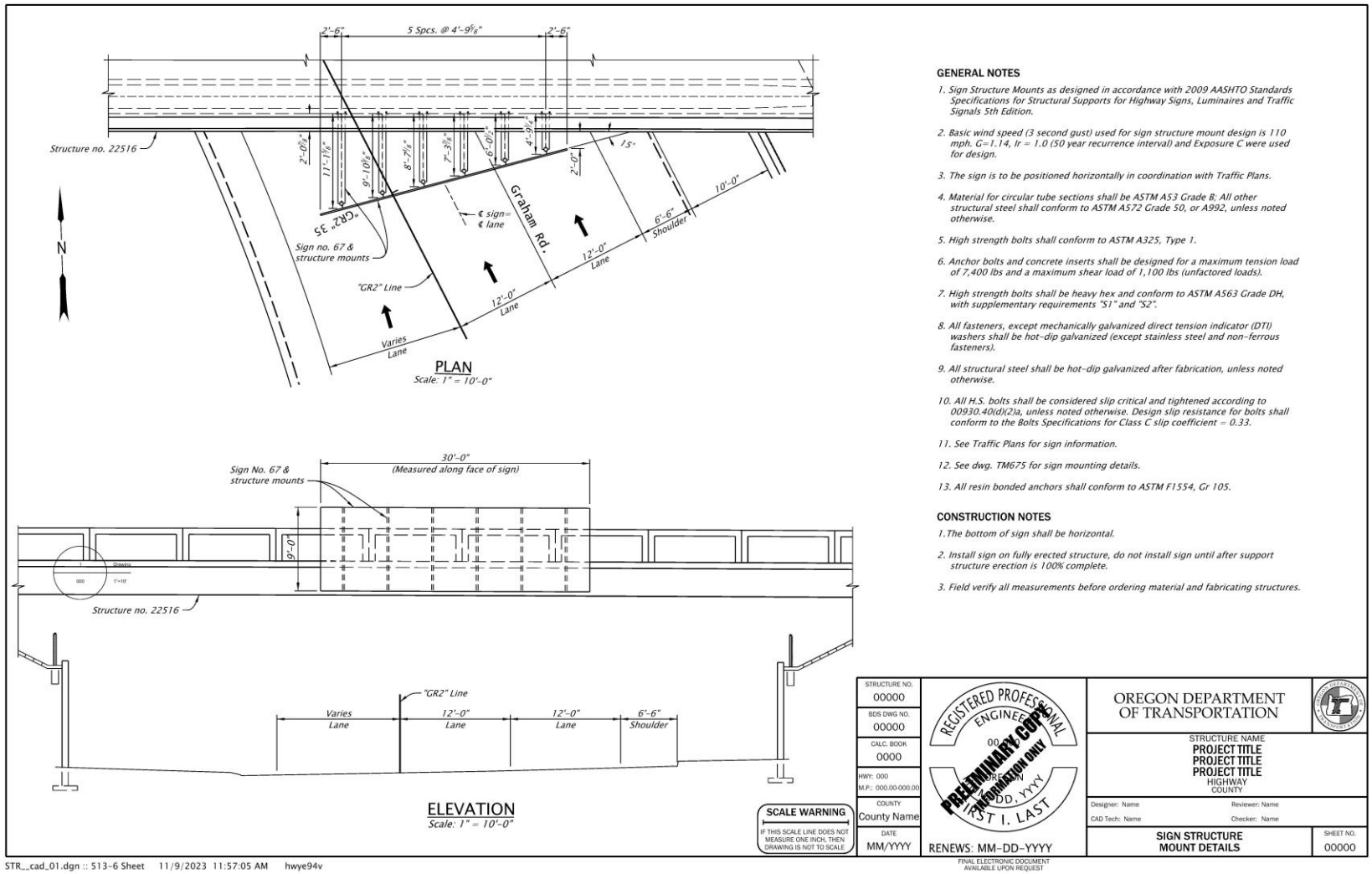


144

Figure 513-5 Protective Screening Details

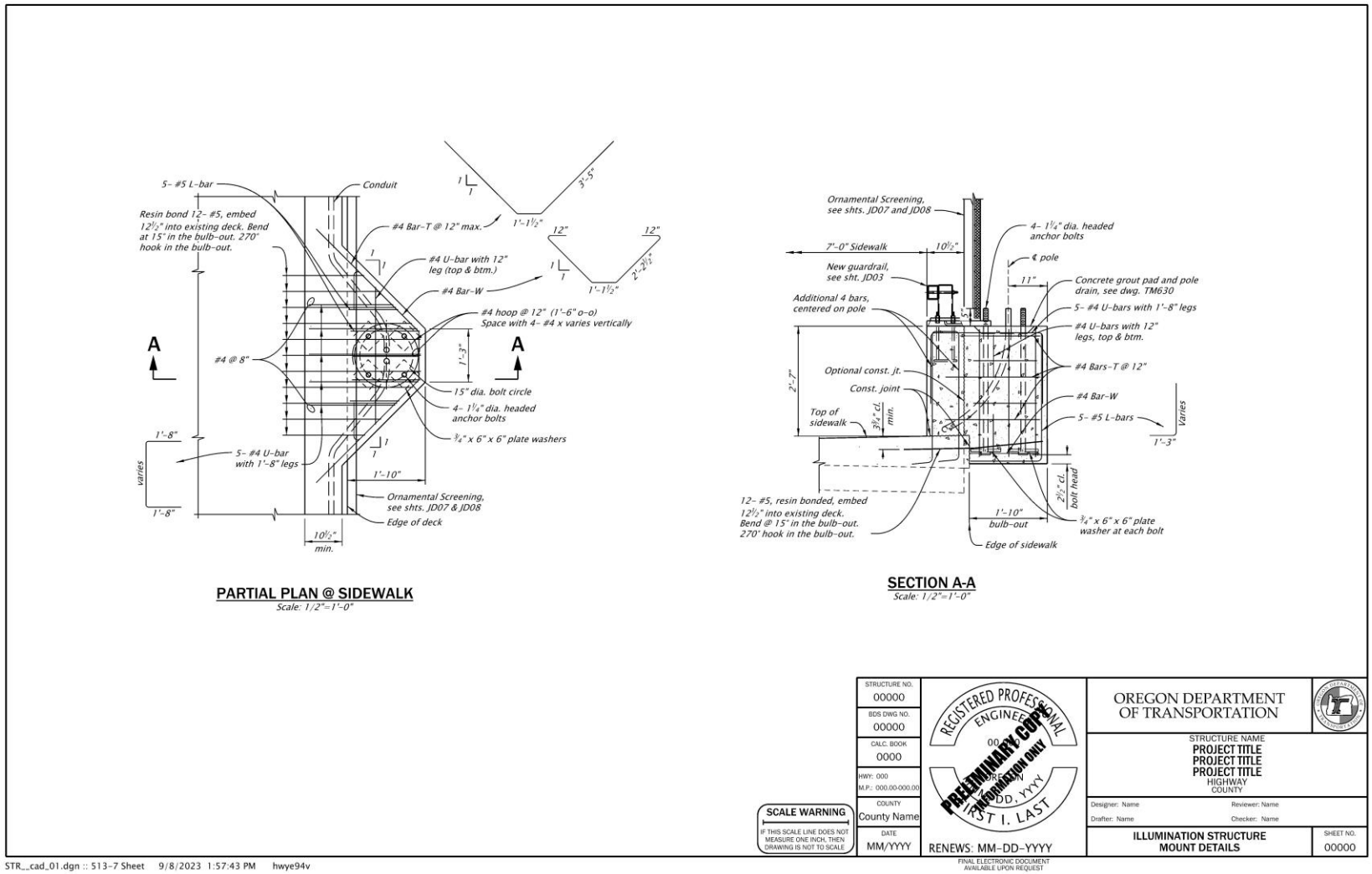


147 Figure 513-6 Sign Structure Mount Details



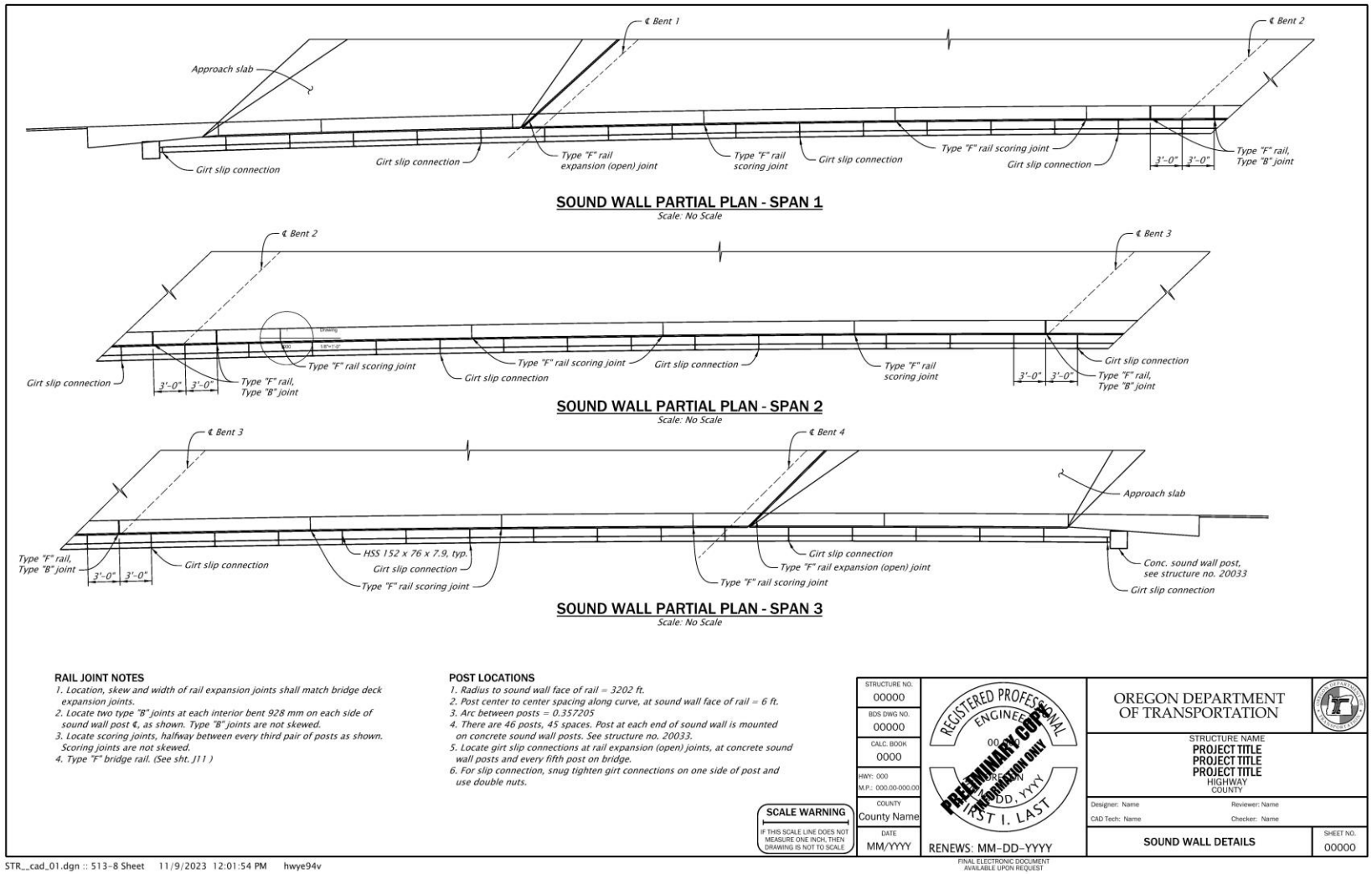
148

149 Figure 513-7 Illumination Structure Mount Details

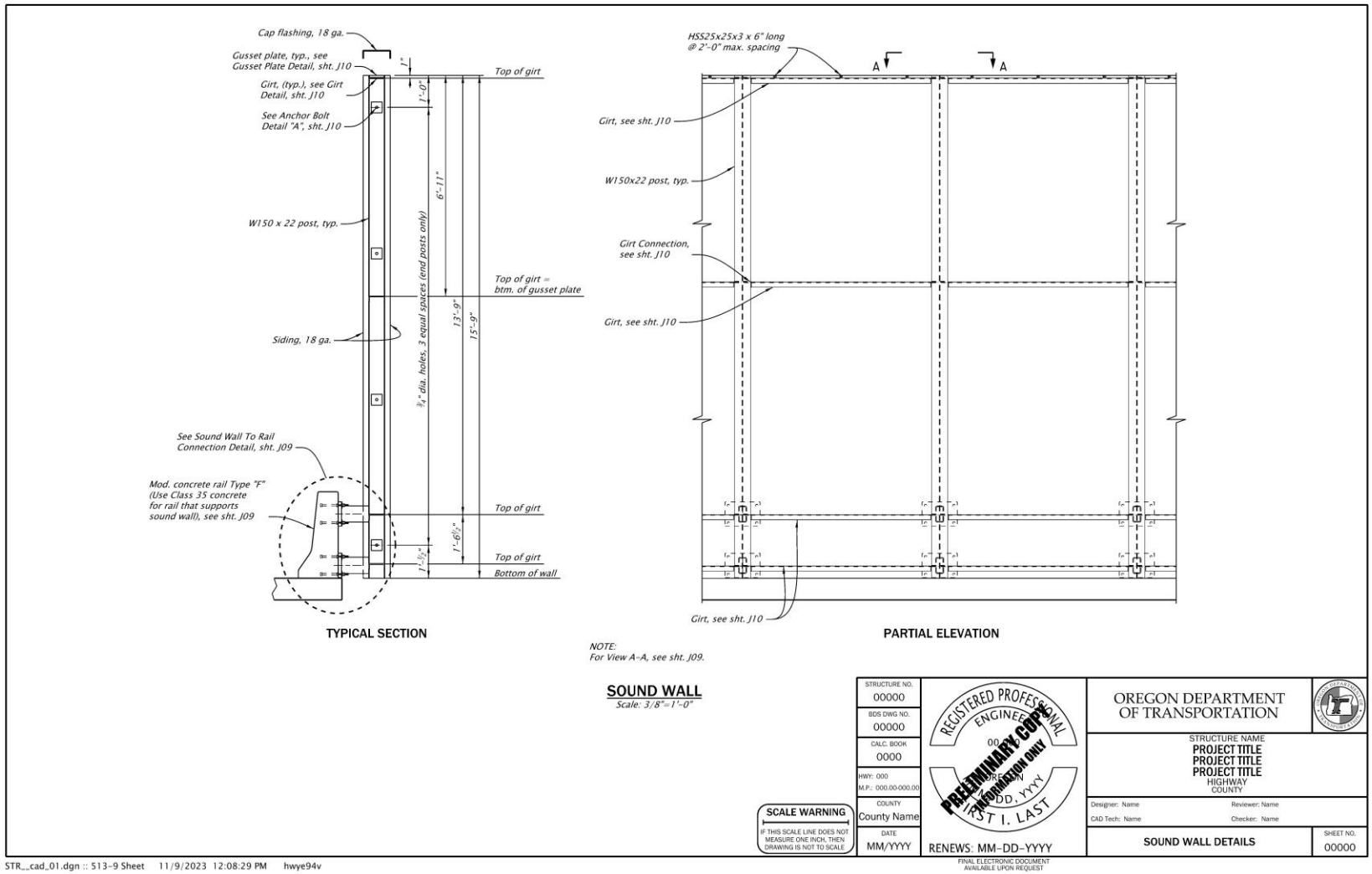


150

Figure 513-8 Sound Wall Details-1

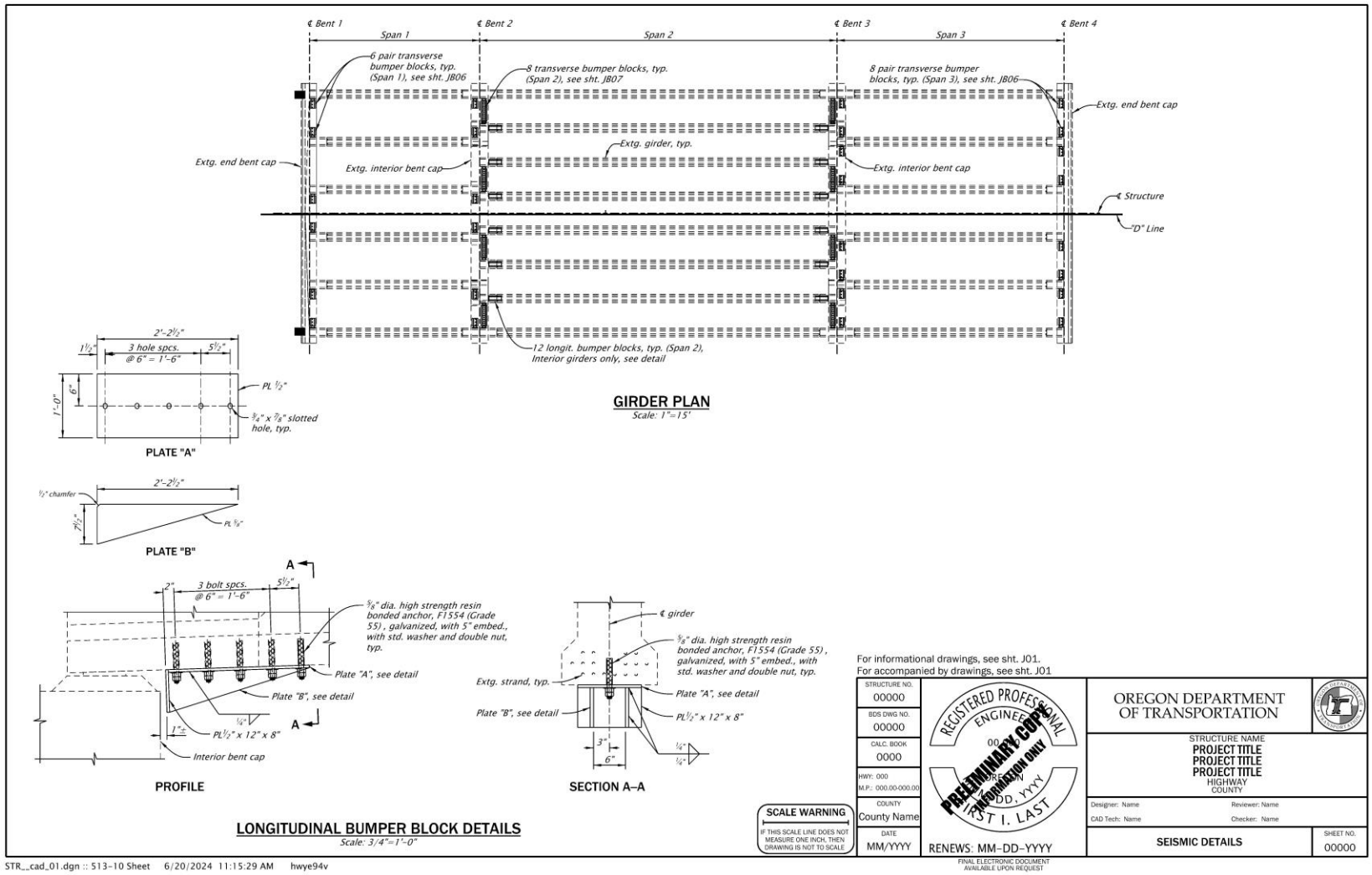


153 Figure 513-9 Sound Wall Details-2

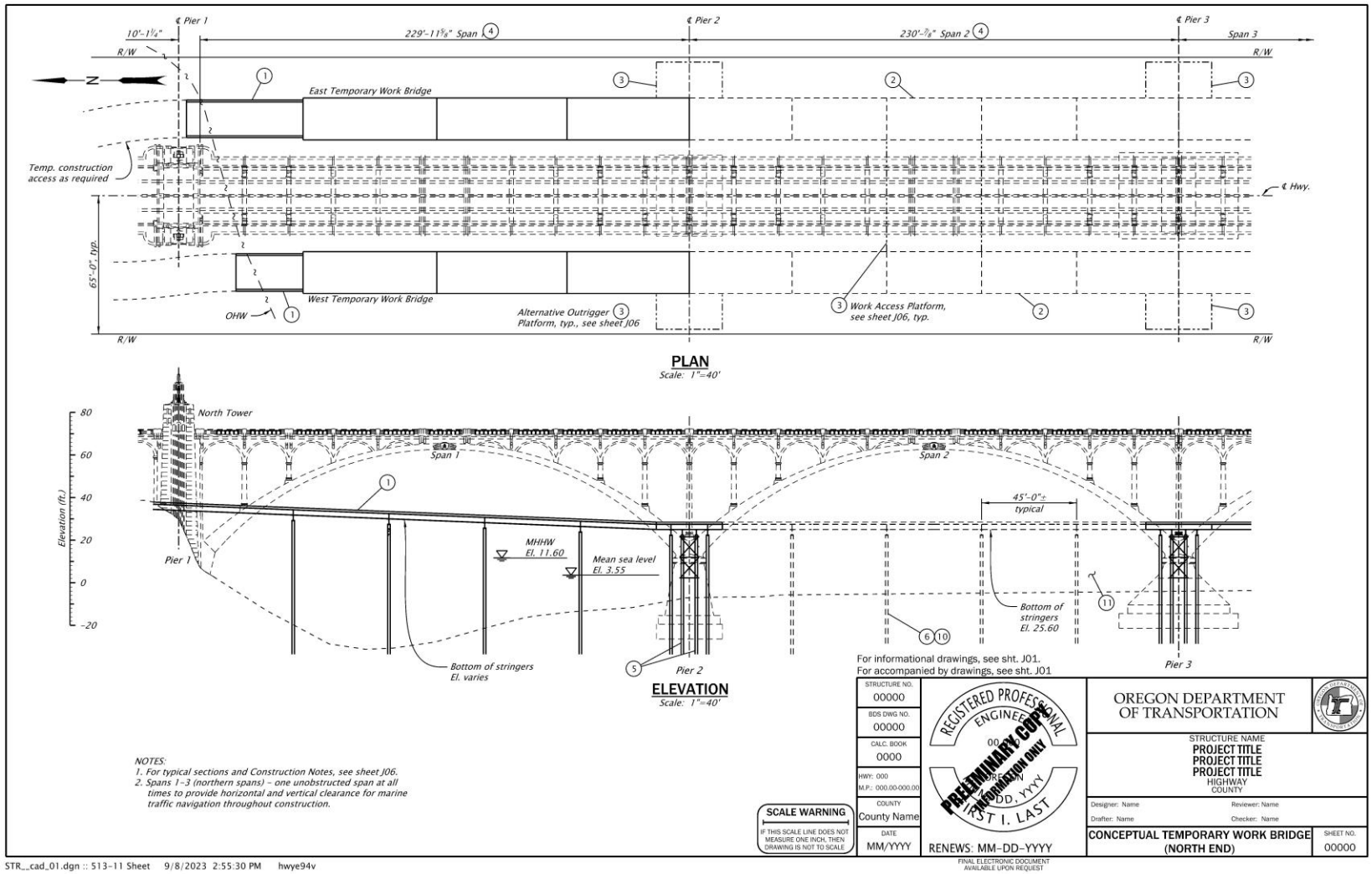


154

Figure 513-10 Seismic Details



157 Figure 513-11 Conceptual Temporary Work Bridge



158

1 Part 600 Bridge Data System

Section 601 Structure and Drawing Numbers

Structure and drawing numbers are obtained using the Bridge Data System (BDS). BDS numbers are requested using the Structure and Drawing Number Request Form. After completing the form as fully as possible, email it to Bridge Section to request assistance. If BDS numbers are frequently needed, instructions for acquiring access to BDS and detailed instructions for using it are available in the Bridge Data System User Guide.

At the DAP milestone, acquire a structure number from the BDS. If there is a risk of the structure being removed from the project, wait until a decision about the structure is made or the Preliminary Plans milestone to obtain a structure number.

BDS drawing numbers are acquired at a reasonable point before the Final plans milestone when there are fewer additions or removals of plan sheets. Enter the project key number and title in the *Description* area. The sheet number is entered in the *SheetNo.-Title* column for each sheet (For example: J01 - Plan and Elevation).

Section 602 Images for BDS

At project completion (bid opening for contract projects, when all addenda have been completed), the digitally signed structure PDF plans are converted to TIF files for upload to BDS.

Uploading images to BDS:

1. For contract plans, locate the "flattened" combined set created by the Project Controls Office and extract the structure plans. For other projects, use the digitally signed PDFs.
2. In Bluebeam or Adobe, change the TIF image settings (See figures 602-1 and 602-2) and export the structure sheets to one TIF file per sheet.
3. When as-constructed changes are complete, new images are uploaded and *replace* the construction plan image.

Figure 600-1 Bluebeam settings for exporting to a TIF image

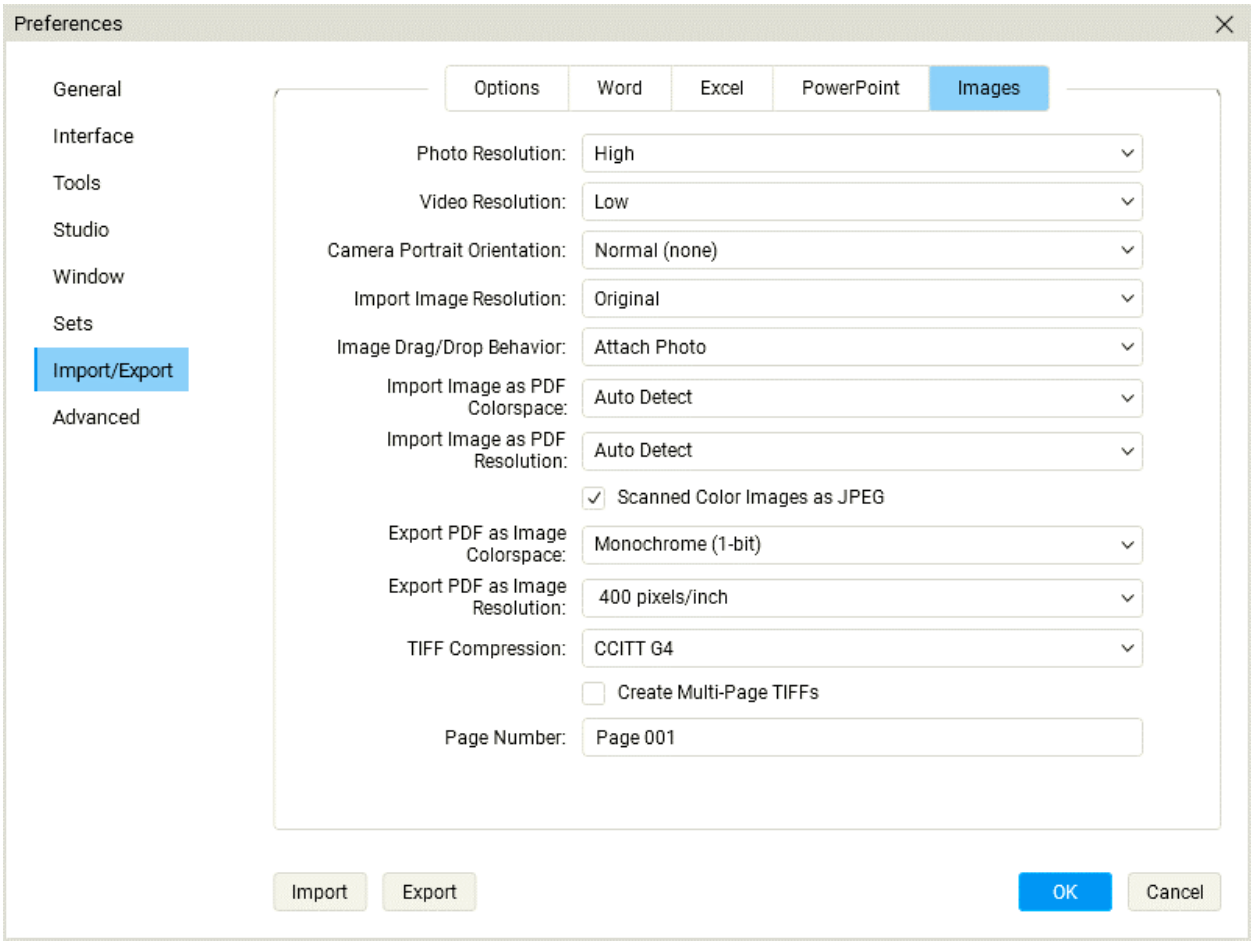
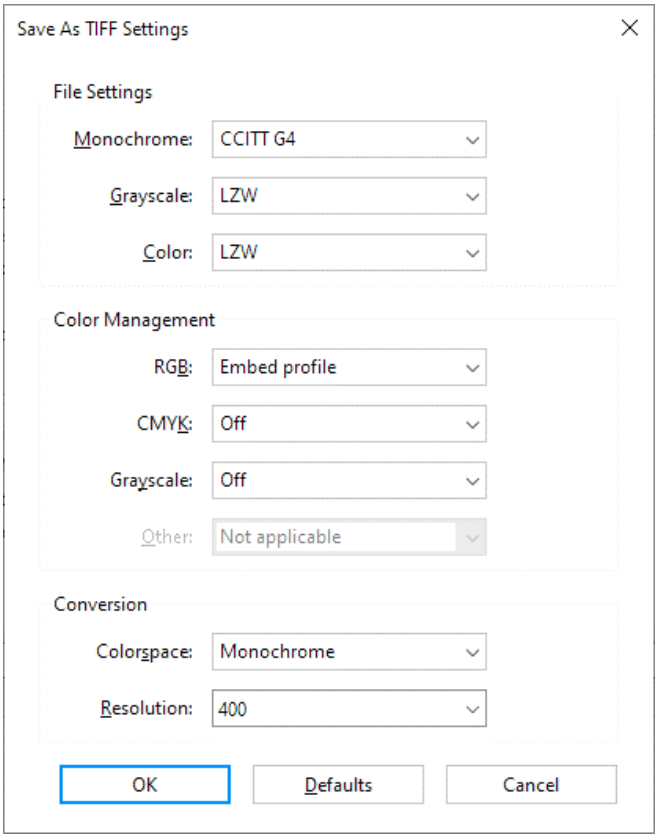


Figure 600-2 Adobe Settings for exporting to a TIF image



1. Rename each TIF file to the BDS drawing number. (For example: 123456.tif)
2. Upload the images into BDS.
    a. If you have BDS access that allows you to upload images, then follow the directions in the Bridge Data System User Guide.
    b. The images may be too large to be sent by email. If you don't have BDS access or access that does not allow you to upload images, then send an email to ODOT Bridge Engineering Section with the subject line of "Upload Design Images to BDS" or "Upload As Constructed Images to BDS", as applicable, to arrange the method to provide the images.

Part 700 As Constructed Plans

Section 701 General Information

See Technical Bulletin RD22-01(B), As Constructed Plans Process and Requirements.

MicroStation files will reside in ODOT ProjectWise project folders.

All changes will be reviewed by the Engineer of Record (EOR).

Design office completes As Constructed edits in a *new version* of the original CAD files in the plan sheets and base files location in ProjectWise. Add "As Constructed" to the end of the file description.

Prior to making as constructed edits, check the Construction Engineering folder for revisions made during construction which may provide data that can be used to update the versioned files in the design folder.

Include a revision triangle next to the change. All as constructed revisions on one sheet will have the date and the same revision number, consecutive with previous revisions on that sheet. See Figure 701-1. If there are no as constructed revisions, add the date and "As Constructed" with no triangle or revision number. See Figure 701-2. The EOR's initials are entered in the "By" column of the revision block. Add the "As Constructed" status stamp and the "Resident Engineer: *<insert name>*" to all sheets. See Figure 701-3.

If a 3D model was developed, details can be affected that may not have been identified in the markups on the plans. Check for details cut from the model that may have changed by the edits and add a triangle.

When complete, send PDFs to the EOR for review. If changes are required, send back to EOR for another review. Upon EOR confirmation, create a .TIF image (400 dpi) and replace the pre-construction image in BDS. See Part 600 of the Bridge Data System User Guide. For those without BDS access, send the .TIF file(s) to ODOT Bridge Engineering.

Confirm BDS data is entered (minimum required):

1. Status (change to In Use)
2. Owner
3. Name
4. Year Built
5. Type
6. Subtype
7. District
8. Region

9. City (as applicable)
10. County
11. Highway
12. Route (as applicable)
13. Direction
14. Milepoint
15. Lat/Long

Once BDS has been updated, send an email to the Region Bridge inspector stating that the files have been updated for given structure.

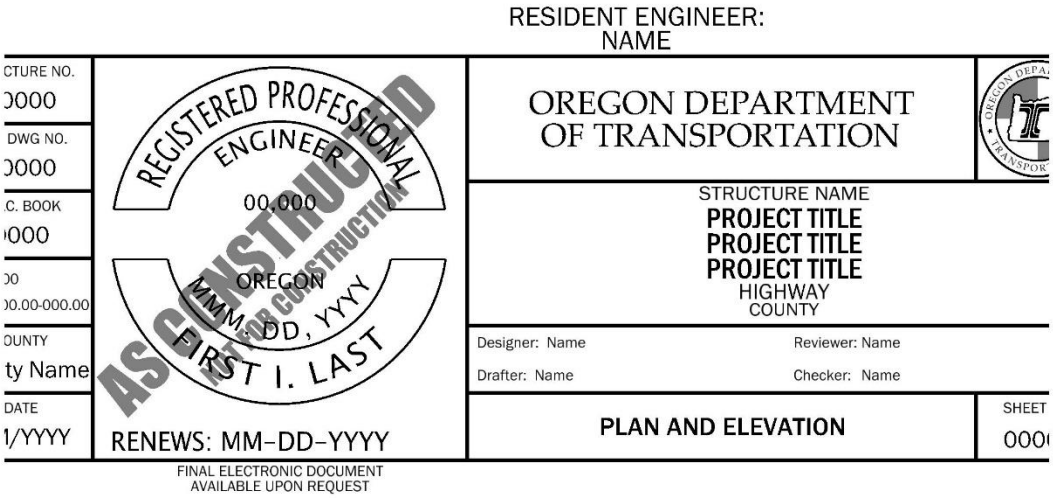
Figure 701-1 Revision block with As Constructed changes

No.	DATE	REVISIONS	BY
1	09-09-09	Change	M.M.M.
2	05-20-10	As constructed	M.M.M.

Figure 701-2 Revision block with no As Constructed changes

No.	DATE	REVISIONS	BY
1	09-09-09	Change	M.M.M.
	05-20-10	As constructed	M.M.M.

Figure 701-3 Title block with As Constructed stamp and Resident Engineer name



1 Part 800 CAD File Archives

Section 801 CAD Files In ProjectWise

For completed projects with folders created in ProjectWise, all CAD and related files (such as Word or Excel) used to produce the contract plans and as-constructed plans will reside in ProjectWise.

Section 802 CAD Files Outside Of ProjectWise

Some CAD files were completed prior to the implementation of ProjectWise or for some other reason did not have folder in ProjectWise. Those files have a different archive process and location. After plans and as-constructed completion, CAD files shall be stored in the Engineering Archives. See the EAST website for instructions on archiving files in *Engineering Archives*.

ODOT provides a safe and reliable multimodal transportation system that connects people and helps Oregon's communities and economy thrive.

www.oregon.gov/ODOT