NEBRASKA Department of Transportation Digital Project Delivery

Traditional Plan to Model as Legal Document Crosswalk Guide

Roadway

NEBRASKA
Good Life. Great Connections.
DEPARTMENT OF TRANSPORTATION

Revision History

Version	Date	Updates
1.0		
2.0		
3.0		Addressed NDOT comments. Added Glossary.

Glossary of Terms

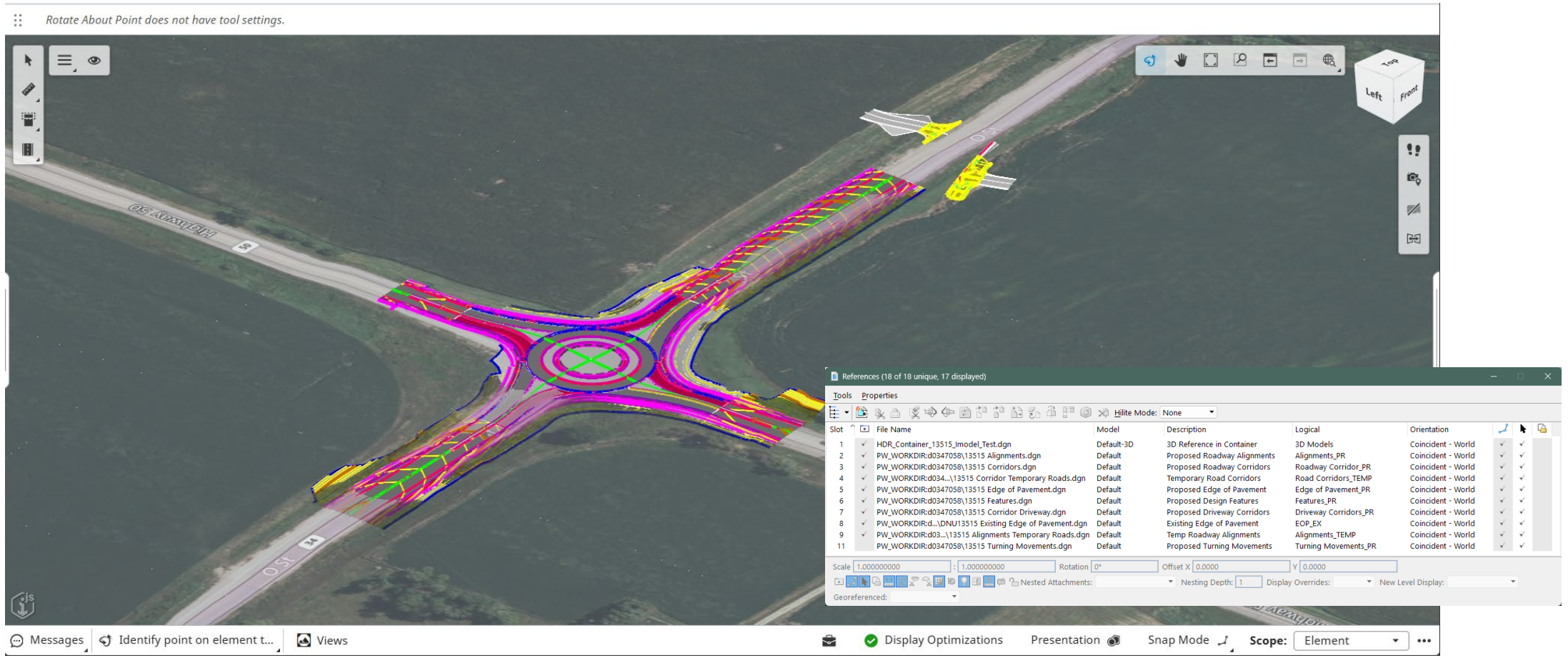
- **Model**: An individual view or “tab” that contains digital project information. Traditionally these “models” are contained in OpenRoads Designer, and different design disciplines create their portion of their digital design within individual models.
- **Federated Model**: a federated model approach includes using separate files for different design disciplines and design tasks, including Alignments, Corridor Models, Superelevation, Terrains (Existing and Proposed), Drainage Design, Traffic, ITS, Lighting, Right-of-Way, Environmental, Bridge, Survey, and any other files necessary for the project. These files are then referenced into one container file that represents the entire digital project.
- **Container File**: a blank file that is used to reference in other design files to provide a holistic view of the design, and that is used to synchronize with Bentley Infrastructure Cloud (BIC)
- **Bentley Infrastructure Cloud (BIC):** a web-based application developed by Bentley that allows for a full review of the design model with comments provided directly in the model. Reviewing abilities include but are not limited to compliance with design standards, clash detection, quantity checks, report generation, etc.
- **Item Types**: These are custom properties that can be attached to certain items (lines, meshes, volumes, areas) within OpenRoads Designer. Properties can include a bid item number, description, quantity takeoff, unit, and other various supporting information needed to support cost estimating and construction activities.
- **Metadata**: Data contained within model elements that provides additional information about the specified element, such as the pay item attributes.

Crosswalk Legend

Project Information Document	Project information will include:
Information Derived from Model Viewer	The Project Model whether it is 2D or 3D provides visibility and access to all elements in the design file.
Model Element Attributes	Attributes of model elements can be derived by either using a tool from the model viewer or simply selecting the element and viewing the attribute in the properties window
2D Details in Model Viewer	Some project information such as typical sections, project details and standard plans may need to be presented as 2D details in the model viewer
Traditional PDF Sheet Deliverable	Local agencies my currently require traditional delivery methods
Information not Included	Data from traditional deliverable not needed for digital delivery

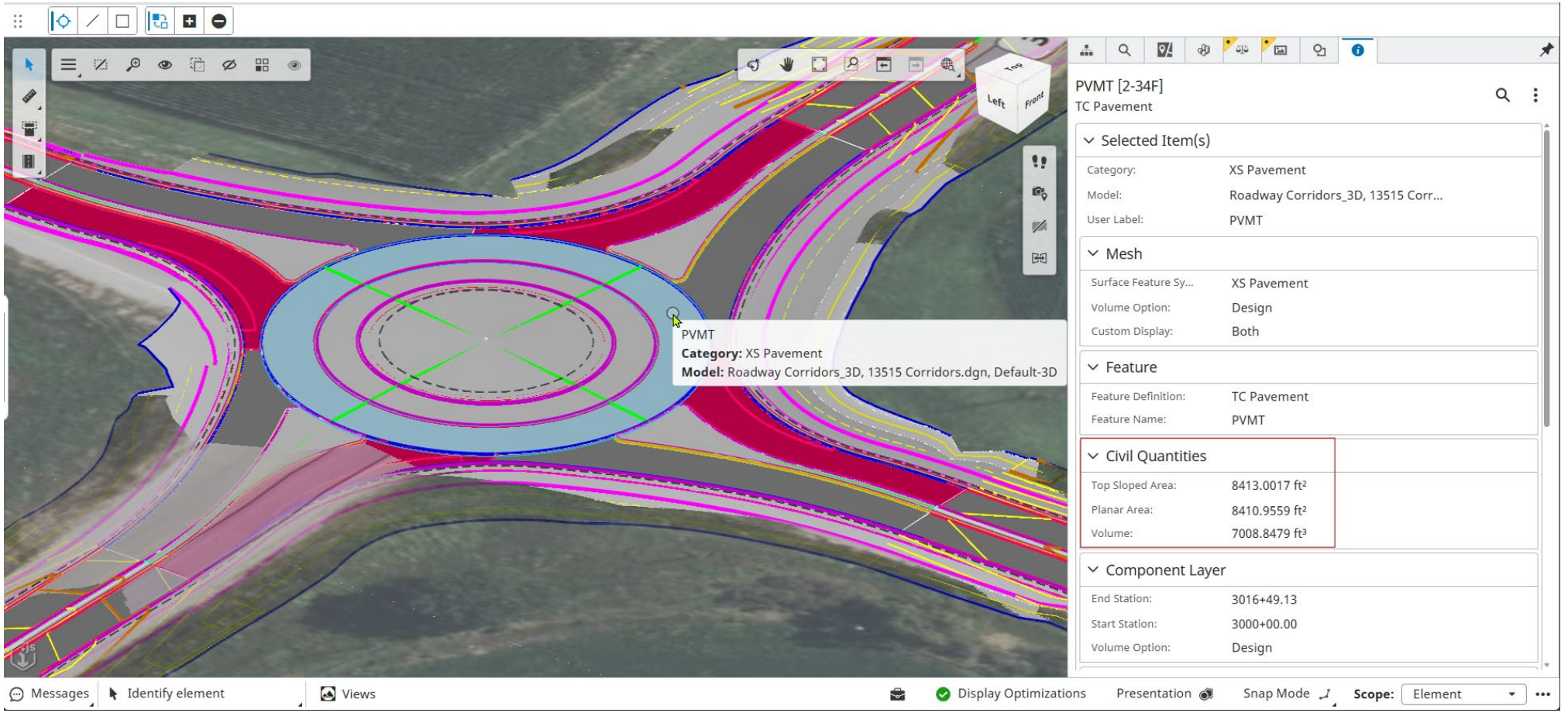
Alternate Format: LandXML, Excel Workbook

Model Example



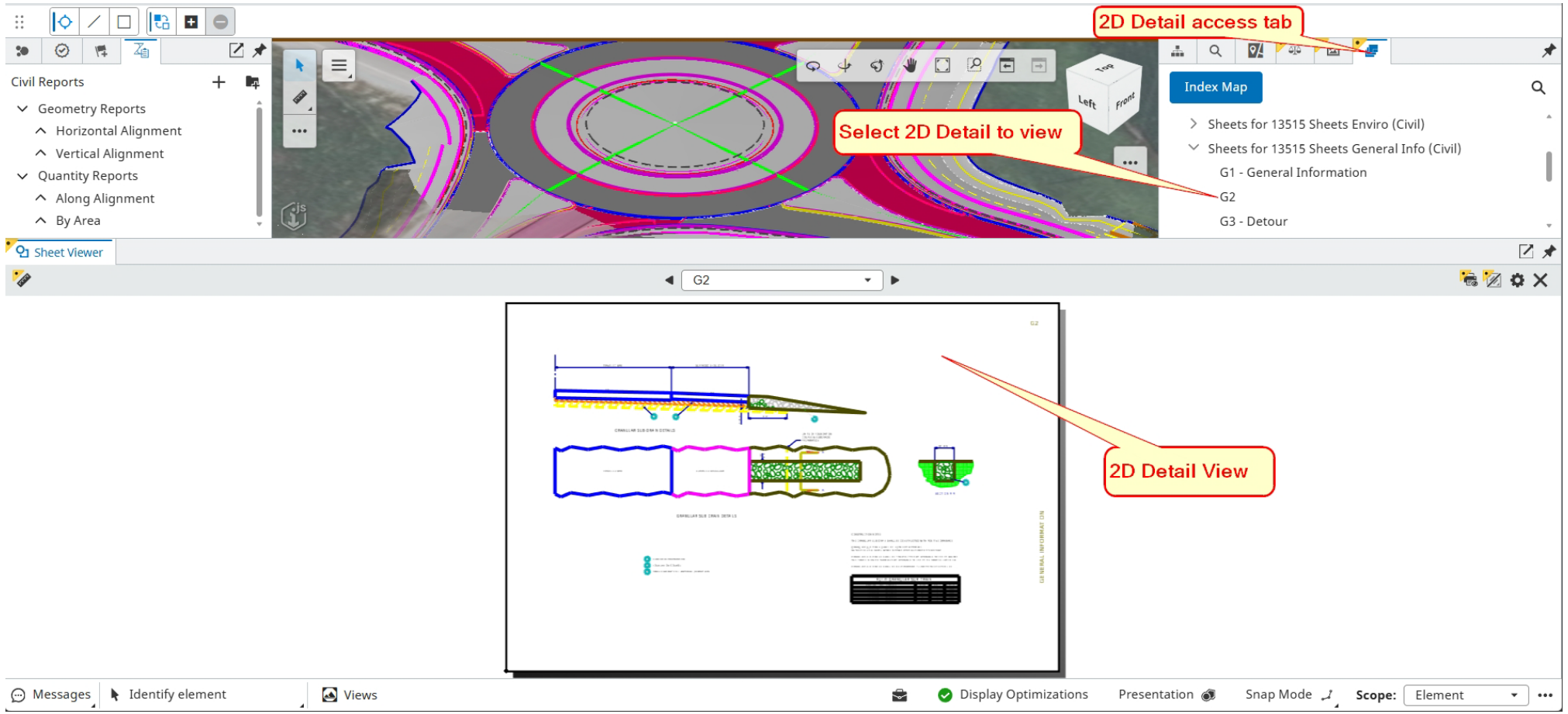
Notes:
The project model consists of all discipline models Federated (referenced) together in a single file. This Federated file is then synchronized to the web application Infrastructure Cloud. Aerial and street mapping is available to stream from Bing. This will likely change in the future as Bentley migrates to Google Maps. However, on some NDOT projects, higher resolution aerial photography can be added via a web map tile service (WMTS). Modeled properties are available when selecting each element.

Model Attributes



Notes:
Model element attributes can be viewed by selecting model elements. These attributes are either provided through the modeling process or added to the model elements by way of custom properties (item types) in OpenRoads Designer. The number of metadata needed for each model element depends on the proposed design intent and the necessary inspection and construction operations.

2D Details



Notes:
2D Details (sheets) are provided to support the project model. These details are available to be viewed in the web application while reviewing the model.

Project Information

STATE OF NEBRASKA
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DETAIL PLANS
JCT. US-34/N-50
CASS COUNTY

EARTHWORK QUANTITIES		
PHASE	EXCAVATION AVAILABLE (CU. YDS.)	EARTHWORK MEASURED IN EMBANKMENT (CU. YDS.)
PHASE 1	246	18
PHASE 3	3566	6268
PHASE 4	1750	1531
PHASE 5	1167	642
TOTAL	6729	8459

Control Point Data						
Control Point	X	Y	Z	Station	Offset	OBJECT USED FOR STATION
BM 95-B	2580587.060	528947.959	1220.073	Beyond Reference Limits	-	CONC. MON. WITH BRASS CAP
CP 94-901	2569390.693	528747.734	1276.882	Beyond Reference Limits	-	CONC. MON. W/ ALUM. CAP
LUDI	2576448.183	529591.154	1221.618	Beyond Reference Limits	-	STEEL ROD IN SLEEVE

NOTE: CONTROL POINT TIE INFORMATION AVAILABLE UPON REQUEST.

CONCRETE PAVEMENT ITEMS
GROUP 3

ITEM	QUANTITY	UNITS
PERMANENT PAVEMENT MARKING, PAINT	12,000.000	LF
MOBILIZATION	1.000	LS
DELINEATOR, TYPE II	42.000	EACH
FLEXIBLE POST DELINEATOR, SURFACE MOUNT	97.000	EACH
CONCRETE CLASS 47B-3500 LIP CURB, TYPE II	598.000	LF
6" CONCRETE CLASS 47B-3500 IMPRINTED MEDIAN SURFACING	4,263.000	SY
CONCRETE CLASS 47B-3000 MEDIAN SURFACING 4"	333.000	SY
6" CONCRETE CLASS 47B-3500 MEDIAN SURFACING	2,167.000	SY
8" IMPRINTED CONCRETE PAVEMENT, CLASS 47B-3500	471.000	SY
10" CONCRETE PAVEMENT, CLASS 47B-350(	2,686.000	SY
10" IMPRINTED CONCRETE PAVEMENT, CLASS 47B-3500	1,037.000	SY
10" DOWELED CONCRETE PAVEMENT, CLASS 47B-3500	15,164.000	SY
TEMPORARY SURFACING 10"	1,364.000	SY
4" NONPERFORATED PIPE UNDERDRAIN	944.000	LF
4" PERFORATED PIPE UNDERDRAIN	5,411.000	LF
YIELD LINE, PERMANENT PAVEMENT MARKING	4.000	EACH
6" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	9,200.000	LF
6" YELLOW WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	8,400.000	LF
12" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	200.000	LF
18" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	130.000	LF
FOUNDATION COURSE 4"	20,647.000	SY
FOUNDATION COURSE 14"	4,263.000	SY
STABILIZED SUBGRADE	24,910.000	SY
WATER	100.000	MGAL
EARTH SHOULDER CONSTRUCTION	49.630	STA
MILLED RUMBLE STRIPS	4.000	EACH
CONCRETE SURFACE MILLING	604.000	SY

DESIGN DESIGNATION
3R RURAL TRAFFIC
HWY. US-34

YEAR:	2026	2046
ADT:	3,670	4,580
DHV:	-	-

T= 19 % D= - %

DESIGN DESIGNATION
3R RURAL TRAFFIC
HWY. N-50

YEAR:	2026	2046
ADT:	2,195	2,195
DHV:	-	-

T= 12 % D= - %

THE WORK ON THIS PROJECT CONSISTS OF GROUPS
1 - GRADING, 3 - CONCRETE PAVEMENT, 3A -CONCRETE PAVEMENT,
3B - CONCRETE PAVEMENT, 4 - CULVERTS,
4A - SANITARY SEWER & WATERMAIN, 5 - SEEDING,
8B - ELECTRICAL, 8C - SIGNING & 10 - GENERAL

◣ GROUPS 1, 3, 3A OR 3B, 4, 4A, 5, 8B, 8C & 10 ARE INCLUDED
IN THE LETTING OF FEBRUARY 1, 2024

▲ GROUPS _____ ARE INCLUDED
IN THE LETTING OF _____

■ GROUPS _____ ARE INCLUDED
IN THE LETTING OF _____

Notes:
Project information consists of notes, tables, project identification as well as model file certification, For Information Only (FIO) documents. This document will also contain traffic data, earthwork summaries, drainage tables and any other project related information that is not readily modeled.

Plan Sheets in this Crosswalk

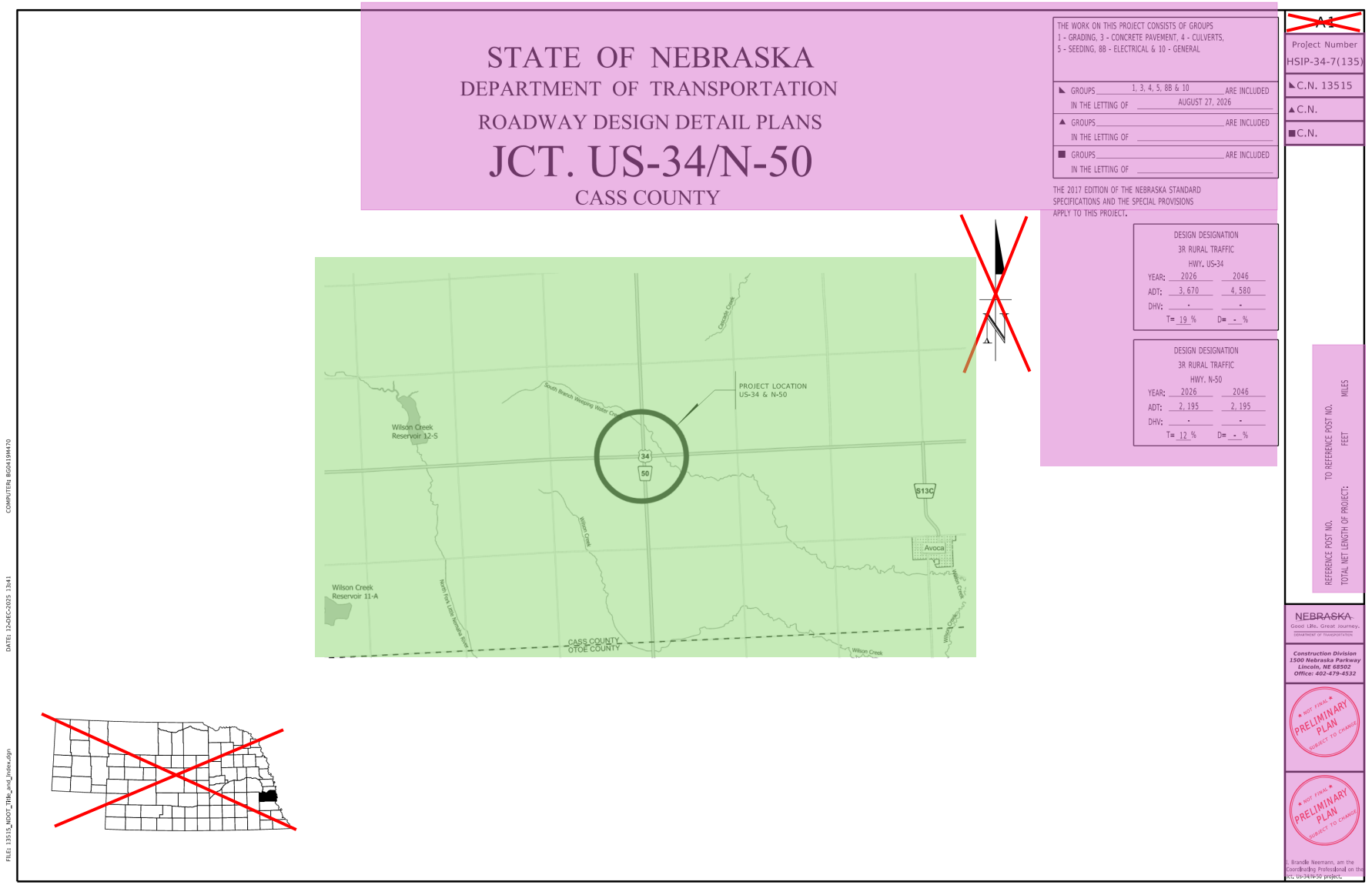
- Cover Sheet
- Index of Sheets
- Typical Cross Sections
- Summary of Quantities
- Environmental
- Horizontal Alignment & Orientation
- Control Point Data
- General Information
- Geometrics
- Grades
- Grading
- Joints
- Drainage
- Removal
- Construction
- Erosion & Sediment Control
- Water Main Plan
- Sanitary Sewer Plan
- Water Main Profile
- Sanitary Sewer Profile
- Utility Details
- Specifications
- Utility Rehabilitation
- Plan and Profile
- Traffic Control
- Sign Install Plan
- Sign Details
- Pavement Markings
- Fabrication and Mounting Details
- Sign Post Installation
- Sign Detail
- Lighting
- ITS Features
- Camera Conduit and Mounting
- Drainage Cross Sections
- Area Inlet Details
- Right of Way Plan
- Cross Section
- Pavement Detail
- Traffic Control – Road Closure
- Pavement Marking
- Temporary Pavement Marking

Cover Sheet

Project Information Document
- Project location
- Project identification
- Traffic Data
- Recycled Content
- Department information
- Coordinating Professional and all Engineer Seal/Signatures

Information Derived from Model Viewer
- Project location

Information not Included
- North arrow
- State Map with County location
- Sheet number



Modeling Notes:
- Model viewing platform will provide a background map that is sufficient to view surrounding vicinity
- Project information document will include all notes, statistics and location information
- Certification Memo will include all engineer seals/signatures and division contact information

Index of Sheets

Information Derived from Model Viewer
- 2D Sheet Index

Project Information Document
- Standard Plans index
- Standard Plans
- Project identification
- Department Information

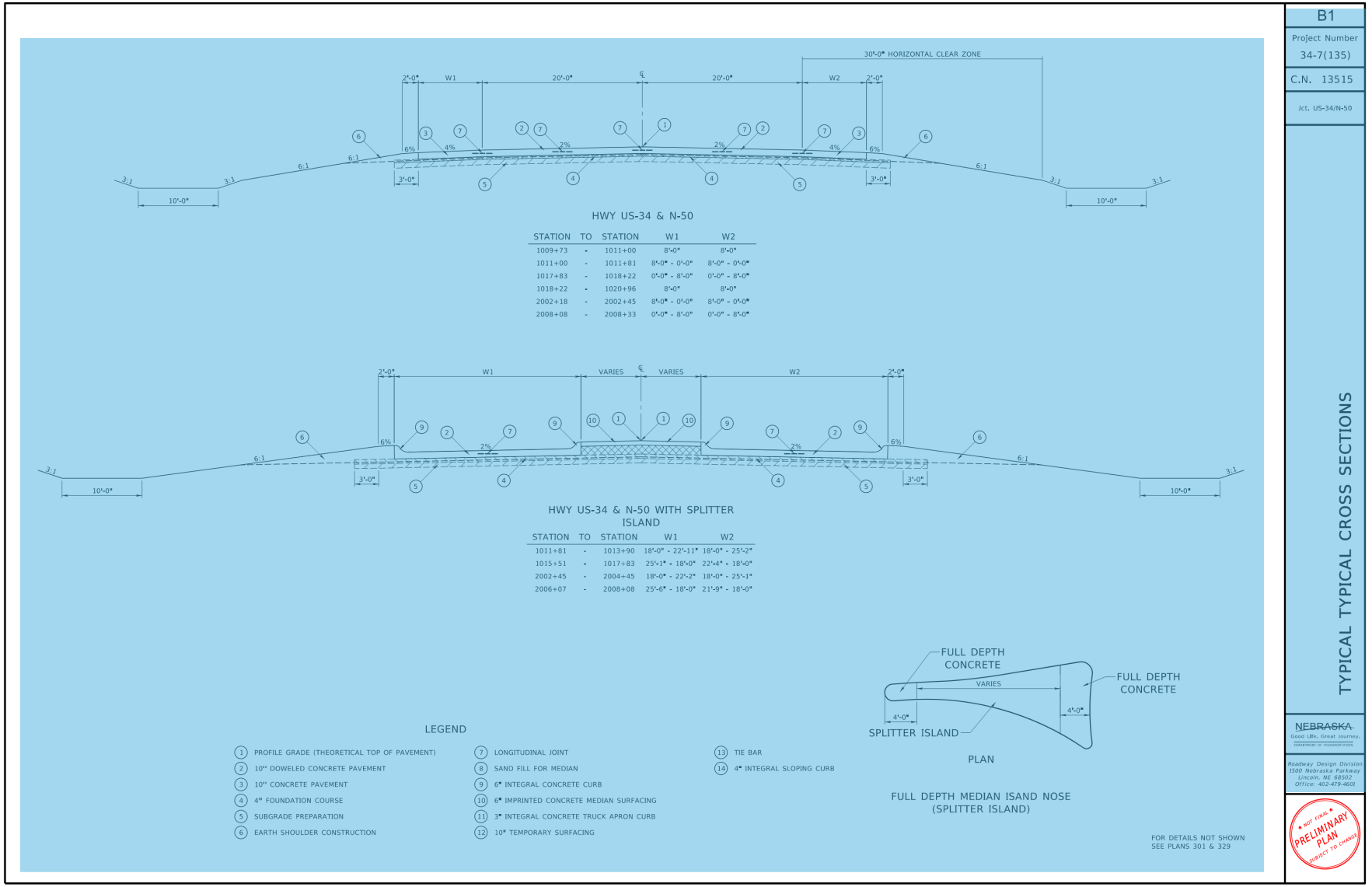
Information not Included
- Sheet number
- Sheet name

Modeling Notes:
- Standard Plans are in a single pdf within the Digital File package

Typical Cross Sections

2D Data in Sheet Index

- Typical Sections
- Sheet name
- Sheet Number
- Project identification
- Department Information



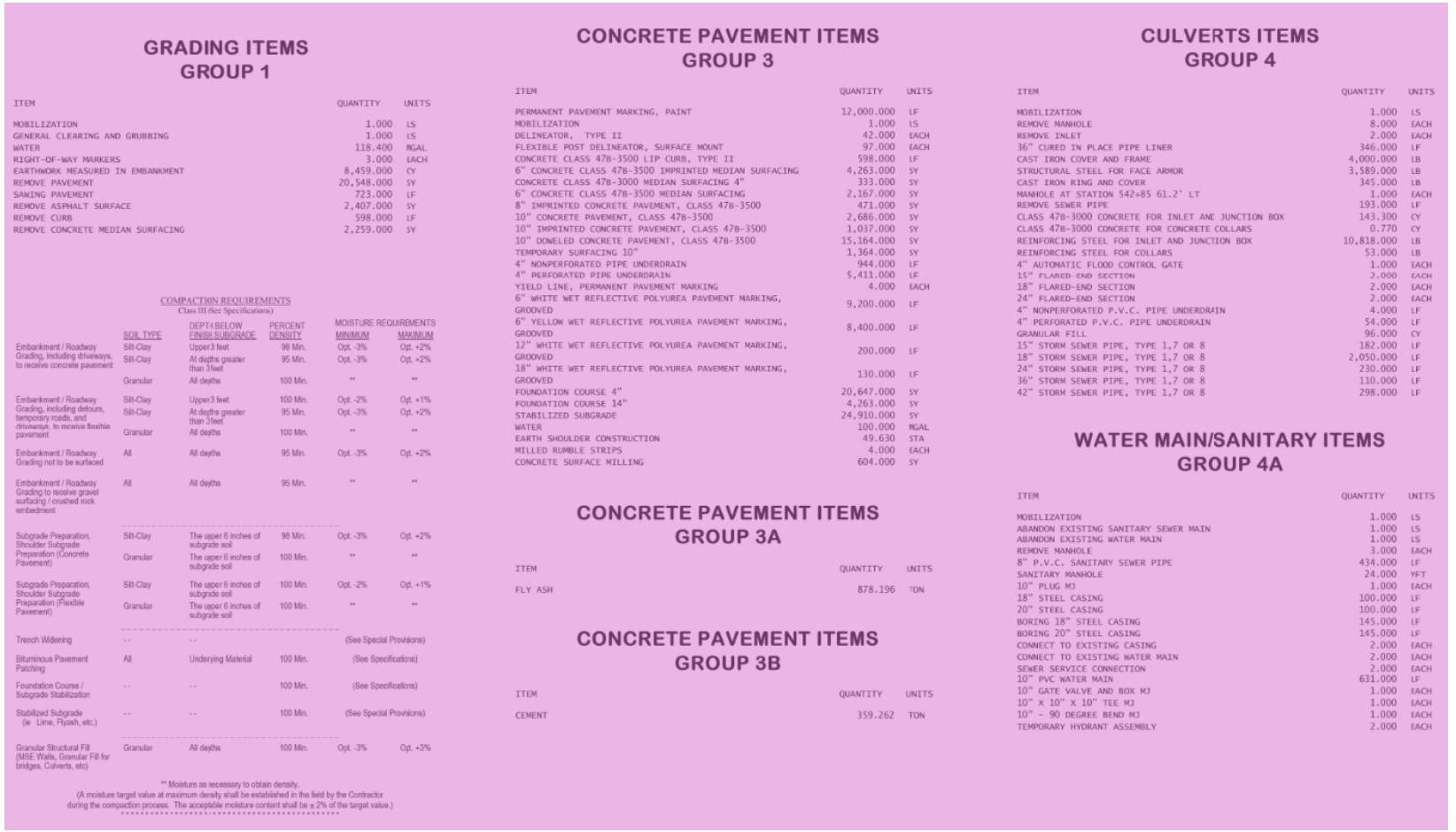
Modeling Notes:

- 2D Sheet Model of Typical Cross Sections and design details
- Dimensioned and Annotated in Drawing Model
- Includes sheet name and project information for field staff prints

Summary of Quantities

Project Information Document
- Compaction requirement
- Construction Group data
- Department Information

Information not Included
- Sheet number



GRADING ITEMS GROUP 1

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
GENERAL CLEARING AND GRUBBING	1.000	LS
WATER	118.400	MGAL
RIGHT-OF-WAY MARKERS	3.000	EACH
EARTHWORK MEASURED IN EMBANKMENT	8,459.000	CY
REMOVE PAVEMENT	20,548.000	SY
SAWING PAVEMENT	723.000	LF
REMOVE ASPHALT SURFACE	2,407.000	SY
REMOVE CURB	598.000	LF
REMOVE CONCRETE MEDIAN SURFACING	2,259.000	SY

COMPACTION REQUIREMENTS
Class III (See Specifications)

	SOIL TYPE	DEPTH BELOW FINISH SUBGRADE	PERCENT DENSITY	MOISTURE REQUIREMENTS MINIMUM	MAXIMUM
Embankment / Roadway Grading, including driveways, to receive concrete pavement	Silt-Clay	Upper 3 feet	98 Min.	Opt. -3%	Opt. +2%
	Silt-Clay	At depths greater than 3 feet	95 Min.	Opt. -3%	Opt. +2%
	Granular	All depths	100 Min.	**	**
Embankment / Roadway Grading, including detours, temporary roads, and driveways, to receive flexible pavement	Silt-Clay	Upper 3 feet	100 Min.	Opt. -2%	Opt. +1%
	Silt-Clay	At depths greater than 3 feet	95 Min.	Opt. -3%	Opt. +2%
	Granular	All depths	100 Min.	**	**
Embankment / Roadway Grading not to be surfaced	All	All depths	95 Min.	Opt. -3%	Opt. +2%
Embankment / Roadway Grading to receive gravel surfacing / crushed rock embedment	All	All depths	95 Min.	**	**
Subgrade Preparation, Shoulder Subgrade Preparation (Concrete Pavement)	Silt-Clay	The upper 6 inches of subgrade soil	98 Min.	Opt. -3%	Opt. +2%
	Granular	The upper 6 inches of subgrade soil	100 Min.	**	**
Subgrade Preparation, Shoulder Subgrade Preparation (Flexible Pavement)	Silt-Clay	The upper 6 inches of subgrade soil	100 Min.	Opt. -2%	Opt. +1%
	Granular	The upper 6 inches of subgrade soil	100 Min.	**	**
Trench Widening	--	--		(See Special Provisions)	
Bituminous Pavement Patching	All	Underying Material	100 Min.	(See Specifications)	
Foundation Course / Subgrade Stabilization	--	--	100 Min.	(See Specifications)	
Stabilized Subgrade (ie Lime, Flyash, etc.)	--	--	100 Min.	(See Special Provisions)	
Granular Structural Fill (MSE Walls, Granular Fill for bridges, Culverts, etc)	Granular	All depths	100 Min.	Opt. -3%	Opt. +3%

** Moisture as necessary to obtain density.
(A moisture target value at maximum density shall be established in the field by the Contractor during the compaction process. The acceptable moisture content shall be ± 2% of the target value.)

CONCRETE PAVEMENT ITEMS GROUP 3

ITEM	QUANTITY	UNITS
PERMANENT PAVEMENT MARKING, PAINT	12,000.000	LF
MOBILIZATION	1.000	LS
DELINEATOR, TYPE II	42.000	EACH
FLEXIBLE POST DELINEATOR, SURFACE MOUNT	97.000	EACH
CONCRETE CLASS 47B-3500 LIP CURB, TYPE II	598.000	LF
6" CONCRETE CLASS 47B-3500 IMPRINTED MEDIAN SURFACING	4,263.000	SY
CONCRETE CLASS 47B-3000 MEDIAN SURFACING 4"	333.000	SY
6" CONCRETE CLASS 47B-3500 MEDIAN SURFACING	2,167.000	SY
8" IMPRINTED CONCRETE PAVEMENT, CLASS 47B-3500	471.000	SY
10" CONCRETE PAVEMENT, CLASS 47B-3500	2,686.000	SY
10" IMPRINTED CONCRETE PAVEMENT, CLASS 47B-3500	1,037.000	SY
10" DOWELED CONCRETE PAVEMENT, CLASS 47B-3500	15,164.000	SY
TEMPORARY SURFACING 10"	1,364.000	SY
4" NONPERFORATED PIPE UNDERDRAIN	944.000	LF
4" PERFORATED PIPE UNDERDRAIN	5,411.000	LF
YIELD LINE, PERMANENT PAVEMENT MARKING	4.000	EACH
6" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	9,200.000	LF
6" YELLOW WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	8,400.000	LF
12" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	200.000	LF
18" WHITE WET REFLECTIVE POLYUREA PAVEMENT MARKING, GROOVED	130.000	LF
FOUNDATION COURSE 4"	20,647.000	SY
FOUNDATION COURSE 14"	4,263.000	SY
STABILIZED SUBGRADE	24,910.000	SY
WATER	100.000	MGAL
EARTH SHOULDER CONSTRUCTION	49.630	STA
MILLED RUMBLE STRIPS	4.000	EACH
CONCRETE SURFACE MILLING	604.000	SY

CONCRETE PAVEMENT ITEMS GROUP 3A

ITEM	QUANTITY	UNITS
FLY ASH	878.196	TON

CONCRETE PAVEMENT ITEMS GROUP 3B

ITEM	QUANTITY	UNITS
CEMENT	359.262	TON

CULVERTS ITEMS GROUP 4

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
REMOVE MANHOLE	8.000	EACH
REMOVE INLET	2.000	EACH
36" CURED IN PLACE PIPE LINER	346.000	LF
CAST IRON COVER AND FRAME	4,000.000	LB
STRUCTURAL STEEL FOR FACE ARMOR	3,589.000	LB
CAST IRON RING AND COVER	345.000	LB
MANHOLE AT STATION 542+85 61.2' LT	1.000	EACH
REMOVE SEWER PIPE	193.000	LF
CLASS 47B-3000 CONCRETE FOR INLET ANE JUNCTION BOX	143.300	CY
CLASS 47B-3000 CONCRETE FOR CONCRETE COLLARS	0.770	CY
REINFORCING STEEL FOR INLET AND JUNCTION BOX	10,818.000	LB
REINFORCING STEEL FOR COLLARS	53.000	LB
4" AUTOMATIC FLOOD CONTROL GATE	1.000	EACH
15" FLARED-END SECTION	2.000	EACH
18" FLARED-END SECTION	2.000	EACH
24" FLARED-END SECTION	2.000	EACH
4" NONPERFORATED P.V.C. PIPE UNDERDRAIN	4.000	LF
4" PERFORATED P.V.C. PIPE UNDERDRAIN	54.000	LF
GRANULAR FILL	96.000	CY
15" STORM SEWER PIPE, TYPE 1,7 OR 8	182.000	LF
18" STORM SEWER PIPE, TYPE 1,7 OR 8	2,050.000	LF
24" STORM SEWER PIPE, TYPE 1,7 OR 8	230.000	LF
36" STORM SEWER PIPE, TYPE 1,7 OR 8	110.000	LF
42" STORM SEWER PIPE, TYPE 1,7 OR 8	298.000	LF

WATER MAIN/SANITARY ITEMS GROUP 4A

ITEM	QUANTITY	UNITS
MOBILIZATION	1.000	LS
ABANDON EXISTING SANITARY SEWER MAIN	1.000	LS
ABANDON EXISTING WATER MAIN	1.000	LS
REMOVE MANHOLE	3.000	EACH
8" P.V.C. SANITARY SEWER PIPE	434.000	LF
SANITARY MANHOLE	24.000	VFT
10" PLUG MJ	1.000	EACH
18" STEEL CASING	100.000	LF
20" STEEL CASING	100.000	LF
BORING 18" STEEL CASING	145.000	LF
BORING 20" STEEL CASING	145.000	LF
CONNECT TO EXISTING CASING	2.000	EACH
CONNECT TO EXISTING WATER MAIN	2.000	EACH
SEWER SERVICE CONNECTION	2.000	EACH
10" PVC WATER MAIN	631.000	LF
10" GATE VALVE AND BOX MJ	1.000	EACH
10" X 10" X 10" TEE MJ	1.000	EACH
10" - 90 DEGREE BEND MJ	1.000	EACH
TEMPORARY HYDRANT ASSEMBLY	2.000	EACH

~~04~~

Project Number
77-6(1080)

C.N. 13502

~~SUMMARY OF QUANTITIES~~

~~NEBRASKA~~
Good Life. Great Journey.

Roadway Design Division

Modeling Notes:
- Compaction Requirements and Summary of Quantities are separate documents

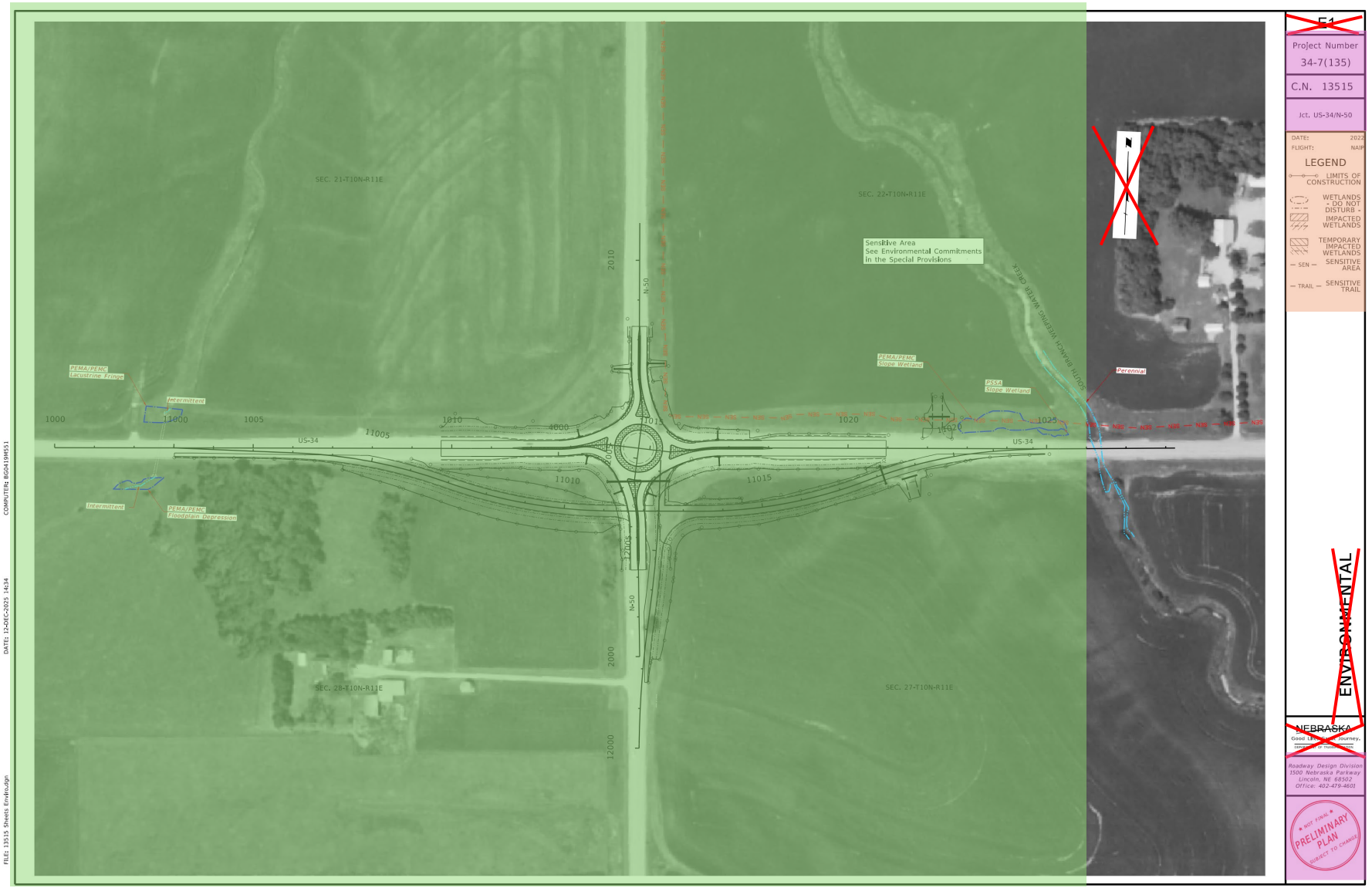
Environmental

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- Environmental elements
- 2D Construction elements
- Limits of Construction

Model Element Attributes
- Environmental element attribution
- Material measurements

Information not Included
- Sheet number
- Sheet name



Modeling Notes:
- Environmental elements are modeled in 2D

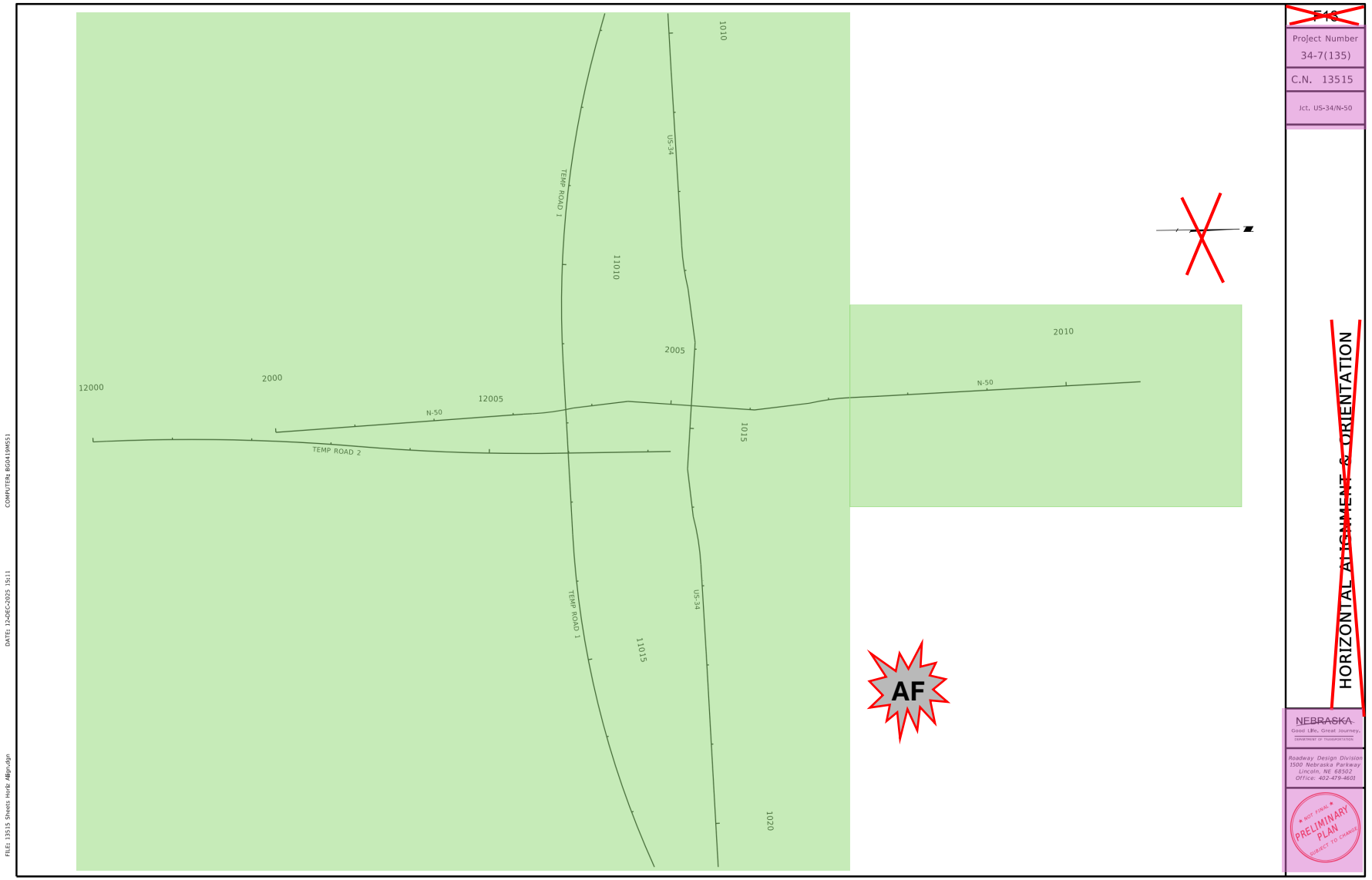
Horizontal Alignment

Project Information Document
- Project identification

Information Derived from Model Viewer
- Horizontal alignment orientation

Model Element Attributes
- Alignment attribution

Information not Included
- Sheet number
- Sheet name



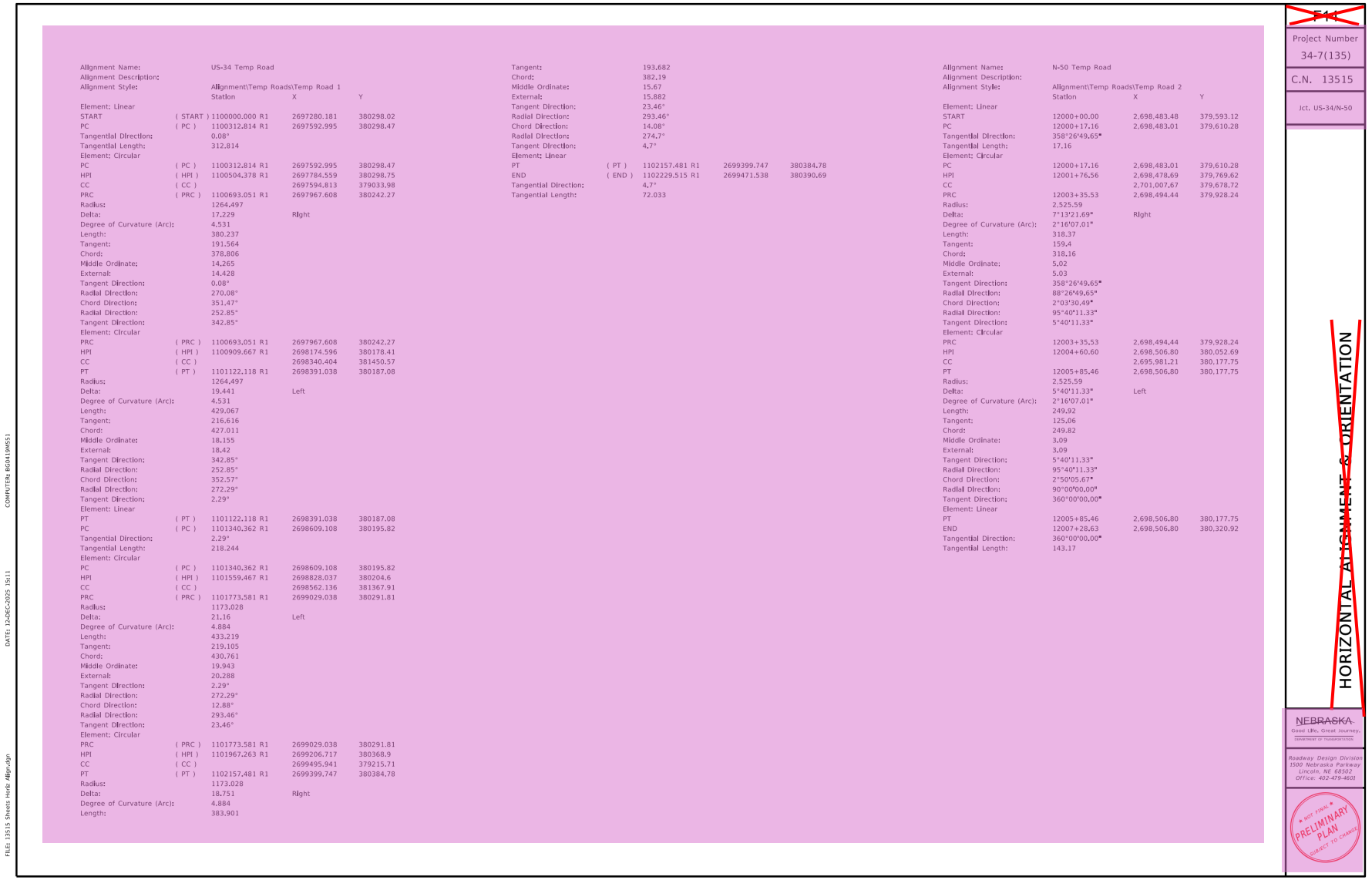
Alternate Data Format
- This alignment data has been exported to LandXML format

Modeling Notes:
- Annotated alignments in design model. Item Type calls out the highway or segment names, active profile, and stationing.

Horizontal Alignment

Project Information Document
- Alignment Reports
- Project identification
- Department Information

Information not Included
- Sheet number
- Sheet name



Alignment Name: US-34 Temp Road
Alignment Description:
Alignment Style: Alignment\Temp Roads\Temp Road 1

		Station	X	Y
Element: Linear				
START	(START)	1100000.000 R1	2697280.181	380298.02
PC	(PC)	1100312.814 R1	2697592.995	380298.47
Tangential Direction:		0.08°		
Tangential Length:		312.814		
Element: Circular				
PC	(PC)	1100312.814 R1	2697592.995	380298.47
HPI	(HPI)	1100504.378 R1	2697784.559	380298.75
CC	(CC)		2697594.813	379033.98
PRC	(PRC)	1100693.051 R1	2697967.608	380242.27
Radius:		1264.497		
Delta:		17.229	Right	
Degree of Curvature (Arc):		4.531		
Length:		380.237		
Tangent:		191.564		
Chord:		378.806		
Middle Ordinate:		14.265		
External:		14.428		
Tangent Direction:		0.08°		
Radial Direction:		270.08°		
Chord Direction:		351.47°		
Radial Direction:		252.85°		
Tangent Direction:		342.85°		
Element: Circular				
PRC	(PRC)	1100693.051 R1	2697967.608	380242.27
HPI	(HPI)	1100909.667 R1	2698174.596	380178.41
CC	(CC)		2698340.404	381450.57
PT	(PT)	1101122.118 R1	2698391.038	380187.08
Radius:		1264.497		
Delta:		19.441	Left	
Degree of Curvature (Arc):		4.531		
Length:		429.067		
Tangent:		216.616		
Chord:		427.011		
Middle Ordinate:		18.155		
External:		18.42		
Tangent Direction:		342.85°		
Radial Direction:		252.85°		
Chord Direction:		352.57°		
Radial Direction:		272.29°		
Tangent Direction:		2.29°		
Element: Linear				
PT	(PT)	1101122.118 R1	2698391.038	380187.08
PC	(PC)	1101340.362 R1	2698609.108	380195.82
Tangential Direction:		2.29°		
Tangential Length:		218.244		
Element: Circular				
PC	(PC)	1101340.362 R1	2698609.108	380195.82
HPI	(HPI)	1101559.467 R1	2698828.037	380204.6
CC	(CC)		2698562.136	381367.91
PRC	(PRC)	1101773.581 R1	2699029.038	380291.81
Radius:		1173.028		
Delta:		21.16	Left	
Degree of Curvature (Arc):		4.884		
Length:		433.219		
Tangent:		219.105		
Chord:		430.761		
Middle Ordinate:		19.943		
External:		20.288		
Tangent Direction:		2.29°		
Radial Direction:		272.29°		
Chord Direction:		12.88°		
Radial Direction:		293.46°		
Tangent Direction:		23.46°		
Element: Circular				
PRC	(PRC)	1101773.581 R1	2699029.038	380291.81
HPI	(HPI)	1101967.263 R1	2699206.717	380368.9
CC	(CC)		2699495.941	379215.71
PT	(PT)	1102157.481 R1	2699399.747	380384.78
Radius:		1173.028		
Delta:		18.751	Right	
Degree of Curvature (Arc):		4.884		
Length:		383.901		
Tangent:		193.682		
Chord:		382.19		
Middle Ordinate:		15.67		
External:		15.882		
Tangent Direction:		23.46°		
Radial Direction:		293.46°		
Chord Direction:		14.08°		
Radial Direction:		274.7°		
Tangent Direction:		4.7°		
Element: Linear				
PT	(PT)	1102157.481 R1	2699399.747	380384.78
END	(END)	1102229.515 R1	2699471.538	380390.69
Tangential Direction:		4.7°		
Tangential Length:		72.033		

Alignment Name: N-50 Temp Road
Alignment Description:
Alignment Style: Alignment\Temp Roads\Temp Road 2

	Station	X	Y
Element: Linear			
START	12000+00.00	2,698,483.48	379,593.12
PC	12000+17.16	2,698,483.01	379,610.28
Tangential Direction:	358°26'49.65"		
Tangential Length:	17.16		
Element: Circular			
PC	12000+17.16	2,698,483.01	379,610.28
HPI	12001+76.56	2,698,478.69	379,769.62
CC		2,701,007.67	379,678.72
PRC	12003+35.53	2,698,494.44	379,928.24
Radius:	2,525.59		
Delta:	7°13'21.69"	Right	
Degree of Curvature (Arc):	2°16'07.01"		
Length:	318.37		
Tangent:	159.4		
Chord:	318.16		
Middle Ordinate:	5.02		
External:	5.03		
Tangent Direction:	358°26'49.65"		
Radial Direction:	88°26'49.65"		
Chord Direction:	2°03'30.49"		
Radial Direction:	95°40'11.33"		
Tangent Direction:	5°40'11.33"		
Element: Circular			
PRC	12003+35.53	2,698,494.44	379,928.24
HPI	12004+60.60	2,698,506.80	380,052.69
CC		2,695,981.21	380,177.75
PT	12005+85.46	2,698,506.80	380,177.75
Radius:	2,525.59		
Delta:	5°40'11.33"	Left	
Degree of Curvature (Arc):	2°16'07.01"		
Length:	249.92		
Tangent:	125.06		
Chord:	249.82		
Middle Ordinate:	3.09		
External:	3.09		
Tangent Direction:	5°40'11.33"		
Radial Direction:	95°40'11.33"		
Chord Direction:	2°50'05.67"		
Radial Direction:	90°00'00.00"		
Tangent Direction:	360°00'00.00"		
Element: Linear			
PT	12005+85.46	2,698,506.80	380,177.75
END	12007+28.63	2,698,506.80	380,320.92
Tangential Direction:	360°00'00.00"		
Tangential Length:	143.17		

F14
Project Number 34-7(135)
C.N. 13515
Jct. US-34/N-50
HORIZONTAL ALIGNMENT & ORIENTATION
NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION
Roadway Design Division
1500 Nebraska Parkway
Lincoln, NE 68502
Office: 402-479-4601
NOT FINAL
PRELIMINARY PLAN
SUBJECT TO CHANGE

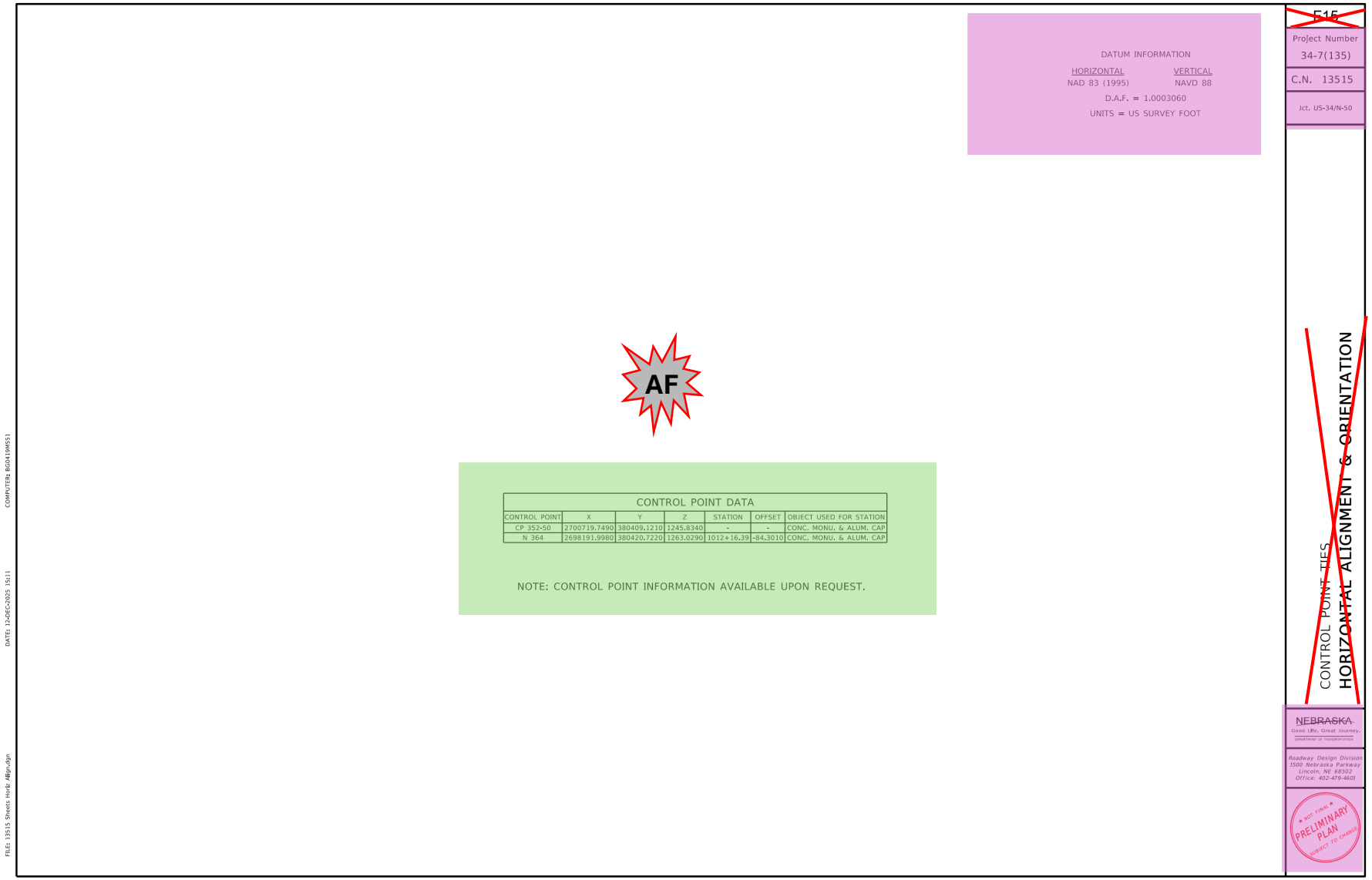
DATE: 12-DEC-2025 15:11
FILE: 13515 Sheets Horiz Alignm.dgn
COMPUTER: RG041995S1

Modeling Notes:
- All alignment reports have been exported to Excel format

Control Point Data

Project Information Document
- Project identification

Information Derived from Model Viewer
- Control Points



AF

Alternate Data Format
- This tabular data has been exported and presented in Excel

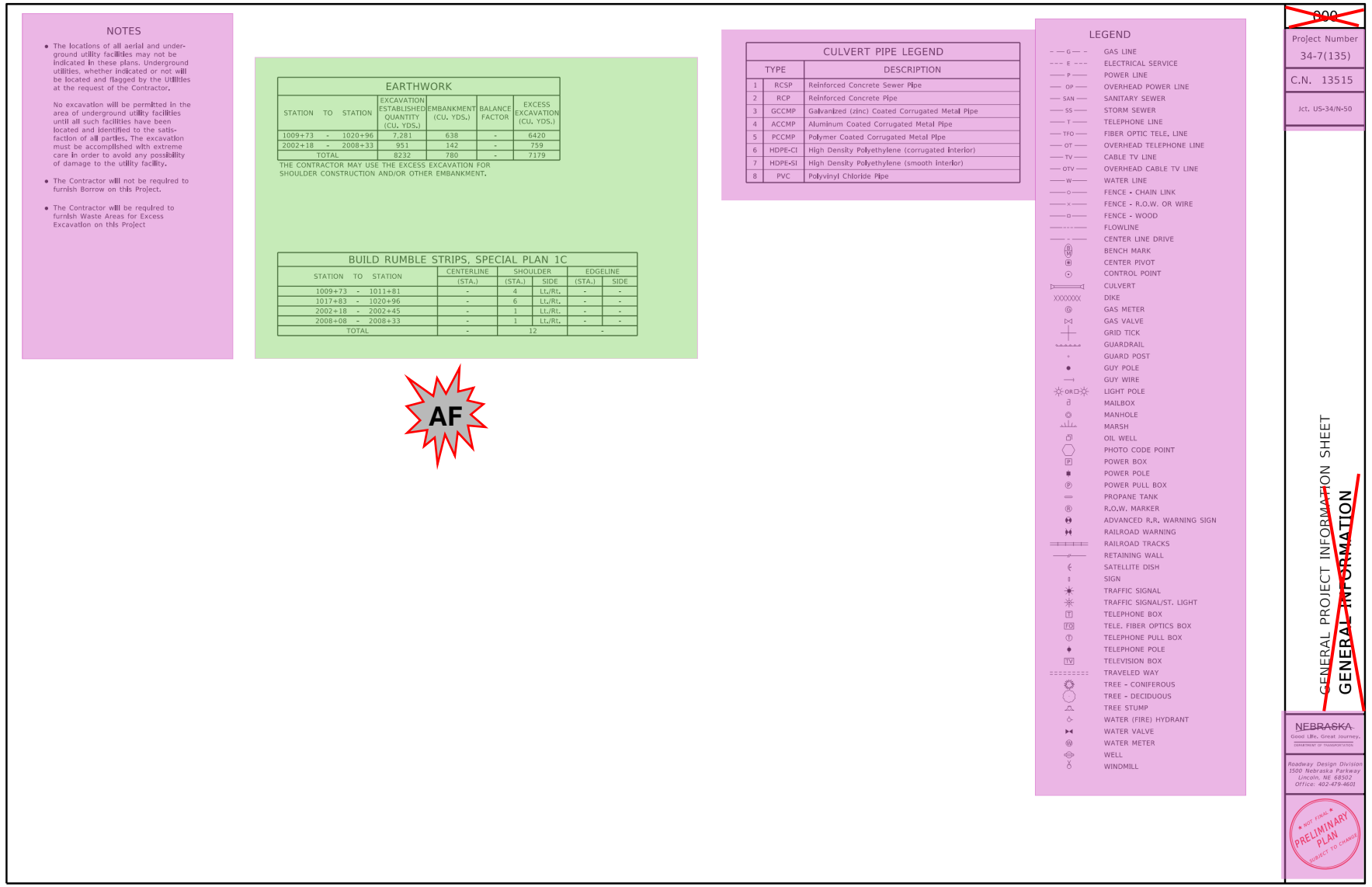
Modeling Notes:
- Control Points are drawn in the model viewer. CSV file of control point data included FIO.

General Information

Project Information Document
- Project identification
- Design notes
- Quantity Tabular Notes
- Culvert pipe legend
- Survey Legend
- Department Information

Information Derived from Model Viewer
- Rumble Strips
- Earthwork Meshes

Information not Included
- Sheet number
- Sheet name



NOTES

- The locations of all aerial and underground utility facilities may not be indicated in these plans. Underground utilities, whether indicated or not will be located and flagged by the Utilities at the request of the Contractor.

  No excavation will be permitted in the area of underground utility facilities until all such facilities have been located and identified to the satisfaction of all parties. The excavation must be accomplished with extreme care in order to avoid any possibility of damage to the utility facility.

- The Contractor will not be required to furnish Borrow on this Project.

- The Contractor will be required to furnish Waste Areas for Excess Excavation on this Project

EARTHWORK

STATION	TO	STATION	EXCAVATION ESTABLISHED QUANTITY (CU. YDS.)	EMBANKMENT (CU. YDS.)	BALANCE FACTOR	EXCESS EXCAVATION (CU. YDS.)
1009+73	-	1020+96	7,281	638	-	6420
2002+18	-	2008+33	951	142	-	759
TOTAL			8232	780	-	7179

THE CONTRACTOR MAY USE THE EXCESS EXCAVATION FOR SHOULDER CONSTRUCTION AND/OR OTHER EMBANKMENT.

BUILD RUMBLE STRIPS, SPECIAL PLAN 1C

STATION	TO	STATION	CENTERLINE (STA.)	SHOULDER (STA.)	SHOULDER SIDE	EDGELINE (STA.)	EDGELINE SIDE
1009+73	-	1011+81	-	4	Lt./Rt.	-	-
1017+83	-	1020+96	-	6	Lt./Rt.	-	-
2002+18	-	2002+45	-	1	Lt./Rt.	-	-
2008+08	-	2008+33	-	1	Lt./Rt.	-	-
TOTAL			-	12		-	

AF

CULVERT PIPE LEGEND

	TYPE	DESCRIPTION
1	RCSP	Reinforced Concrete Sewer Pipe
2	RCP	Reinforced Concrete Pipe
3	GCCMP	Galvanized (zinc) Coated Corrugated Metal Pipe
4	ACCMP	Aluminum Coated Corrugated Metal Pipe
5	PCCMP	Polymer Coated Corrugated Metal Pipe
6	HDPE-CI	High Density Polyethylene (corrugated interior)
7	HDPE-SI	High Density Polyethylene (smooth interior)
8	PVC	Polyvinyl Chloride Pipe

LEGEND

GAS LINE
ELECTRICAL SERVICE
POWER LINE
OVERHEAD POWER LINE
SANITARY SEWER
STORM SEWER
TELEPHONE LINE
FIBER OPTIC TELE. LINE
OVERHEAD TELEPHONE LINE
CABLE TV LINE
OVERHEAD CABLE TV LINE
WATER LINE
FENCE - CHAIN LINK
FENCE - R.O.W. OR WIRE
FENCE - WOOD
FLOWLINE
CENTER LINE DRIVE
BENCH MARK
CENTER PIVOT
CONTROL POINT
CULVERT
DIKE
GAS METER
GAS VALVE
GRID TICK
GUARDRAIL
GUARD POST
GUY POLE
GUY WIRE
LIGHT POLE
MAILBOX
MANHOLE
MARSH
OIL WELL
PHOTO CODE POINT
POWER BOX
POWER POLE
POWER PULL BOX
PROPANE TANK
R.O.W. MARKER
ADVANCED R.R. WARNING SIGN
RAILROAD WARNING
RAILROAD TRACKS
RETAINING WALL
SATELLITE DISH
SIGN
TRAFFIC SIGNAL
TRAFFIC SIGNAL/ST. LIGHT
TELEPHONE BOX
TELE. FIBER OPTICS BOX
TELEPHONE PULL BOX
TELEPHONE POLE
TELEVISION BOX
TRAVELED WAY
TREE - CONIFEROUS
TREE - DECIDUOUS
TREE STUMP
WATER (FIRE) HYDRANT
WATER VALVE
WATER METER
WELL
WINDMILL

000
Project Number 34-7(135)
C.N. 13515
Jct. US-34/N-50
GENERAL PROJECT INFORMATION SHEET
GENERAL INFORMATION
NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION
Roadway Design Division
1500 Nebraska Parkway
Lincoln, NE 68502
Office: 402-479-4601
NOT FINAL
PRELIMINARY PLAN
SUBJECT TO CHANGE

AF

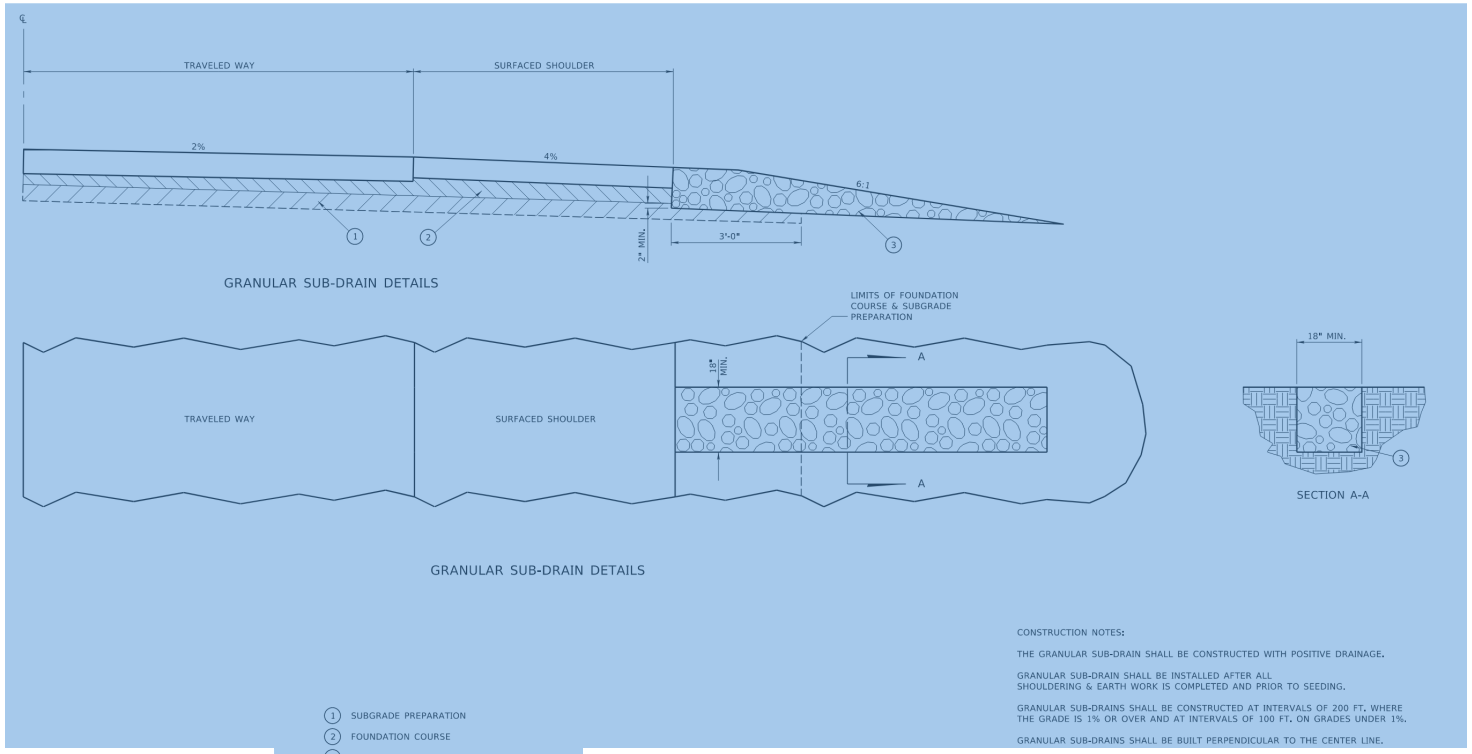
Alternate Data Format
- This tabular data has been exported and presented in Excel. The comps are included in the project documents.

Modeling Notes:
- Rumble Strips are drawn in 2D
- Earthwork is shown in the model as Volumetric Cut & Fill Meshes

General Information

2D Data in Sheet Index
- Design details and notes
- Sheet name
- Sheet Number
- Project identification
- Department Information

Information Derived from Model Viewer
- Subdrain Locations



AF

Alternate Data Format
- This tabular data has been exported and presented in Excel. The comps are included in the project documents.

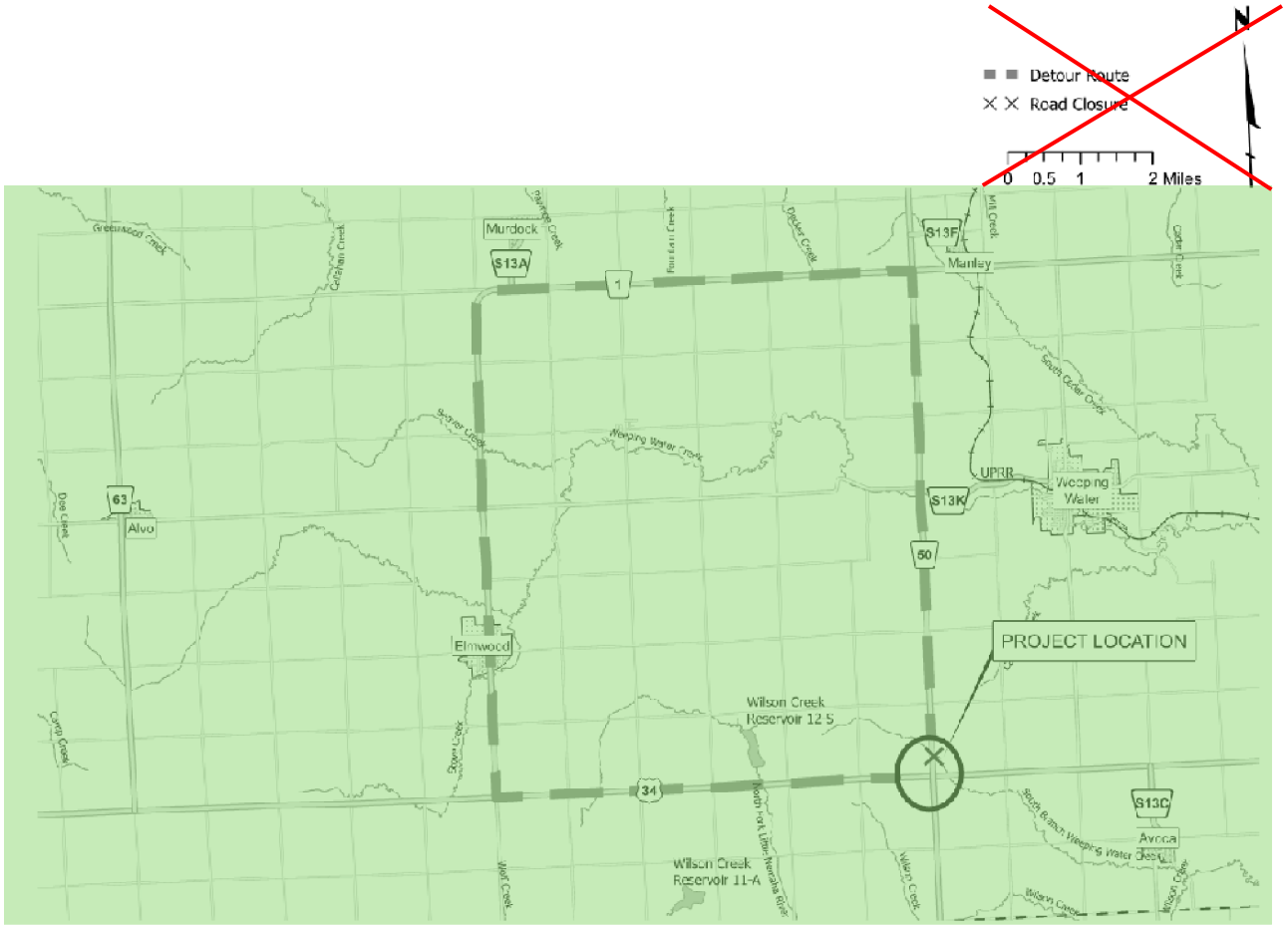
Modeling Notes:
- Details are placed in an OpenRoads Designer sheet model and added to the project's sheet index where it will be synchronized to Bentley Infrastructure Cloud

General Information

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- Detour map

Information not Included
- North arrow
- Legend
- Scale Bar
- Sheet number
- Sheet title



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Project Number 34-7(135)

C.N. 13515

Jct. US-34/N-50

DETOUR ROUTE

GENERAL INFORMATION

NEBRASKA

Good Life. Great Journey.

DEPARTMENT OF TRANSPORTATION

Roadway Design Division
1500 Nebraska Parkway
Lincoln, NE 68502
Office: 402-479-4601

NOT FINAL PRELIMINARY PLAN SUBJECT TO CHANGE

Modeling Notes:
- Model viewing platform provides a background map that is sufficient to view surrounding vicinity

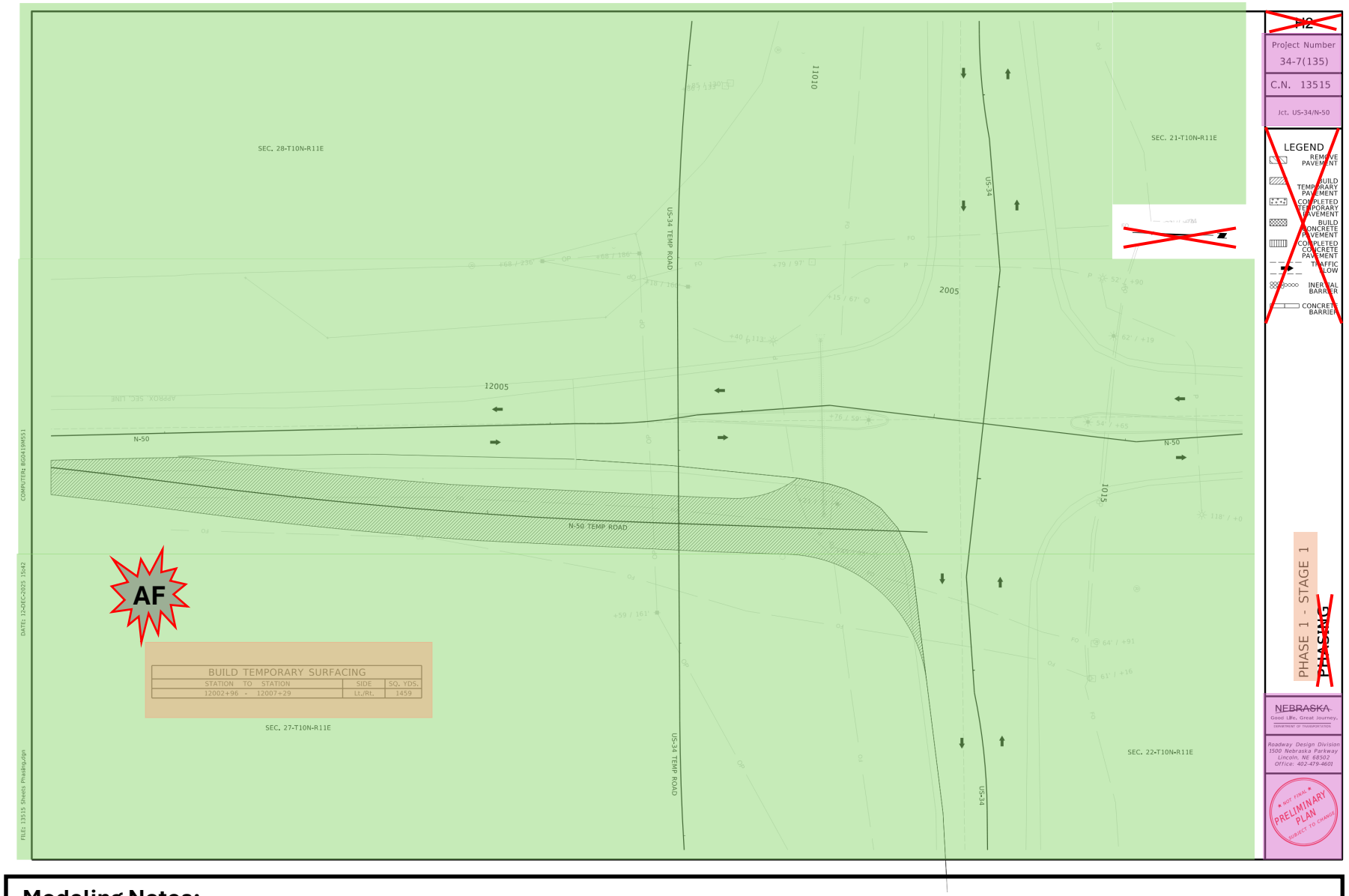
Phasing

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- Phasing Shapes

Model Element Attributes
- Design Quantities
- Phase and Stage

Information not Included
- Sheet title
- North arrow
- Legend



Alternate Data Format
- This tabular data has been exported and presented in Excel. The comps are included in the project documents.

Modeling Notes:
- Phasing shapes are filled with a semi-transparent color fill
- Bentley Infrastructure Cloud includes saved views for each phase and stage

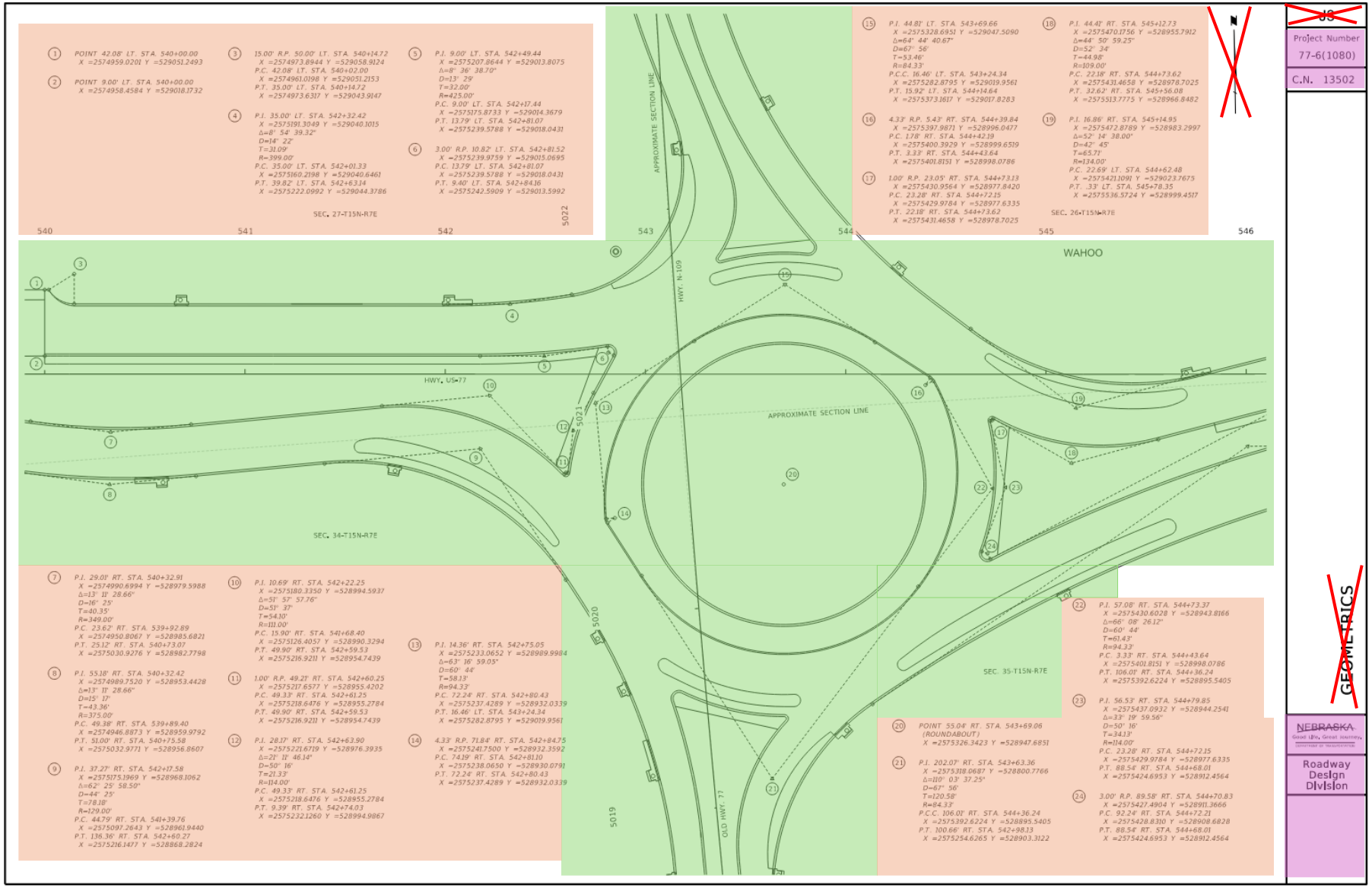
Geometrics

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- 2D line work

Model Element Attributes
- Line geometric information

Information not Included
- Sheet title
- North arrow



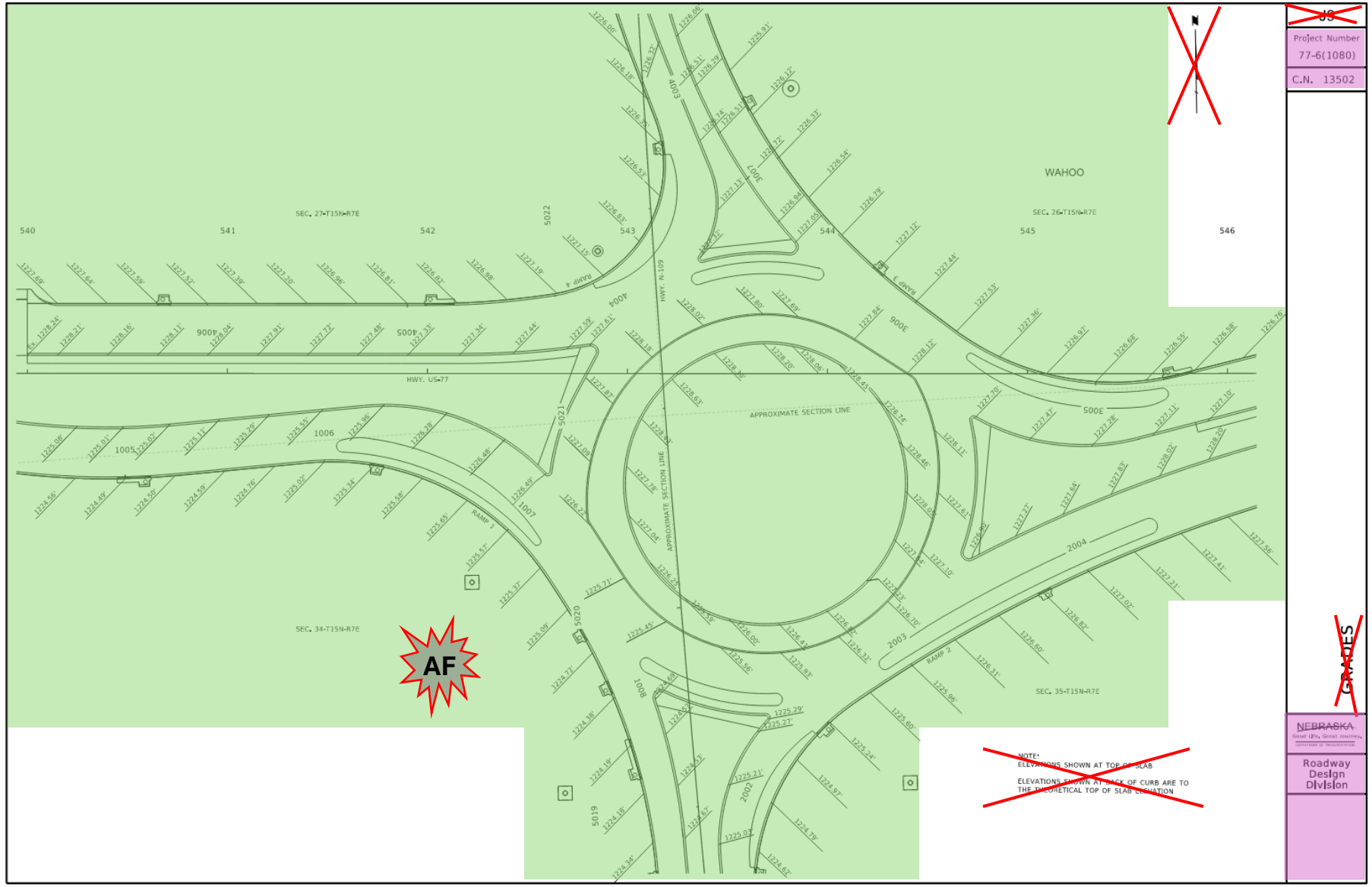
Modeling Notes:
- Line work from the dgn files are directly used to lay out geometrics

Grades

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- Top Surface Grade Elevations

Information not Included
- North arrow
- Sheet number
- Sheet title



Alternate Data Format
- Top Surface and Subgrade Surface terrain models have been exported to LandXML format.

Modeling Notes:
- The project top surface model accurate represents the project's design intent
- Elevation data can be acquired at any location on the project model surface using the Corridor Analysis tools in Bentley Infrastructure Cloud

Grading Plan

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- Project proposed contours

Information not Included
- North arrow
- Sheet number
- Sheet name

Alternate Data Format
- Top Surface and Subgrade Surface terrain models have been exported to LandXML format.

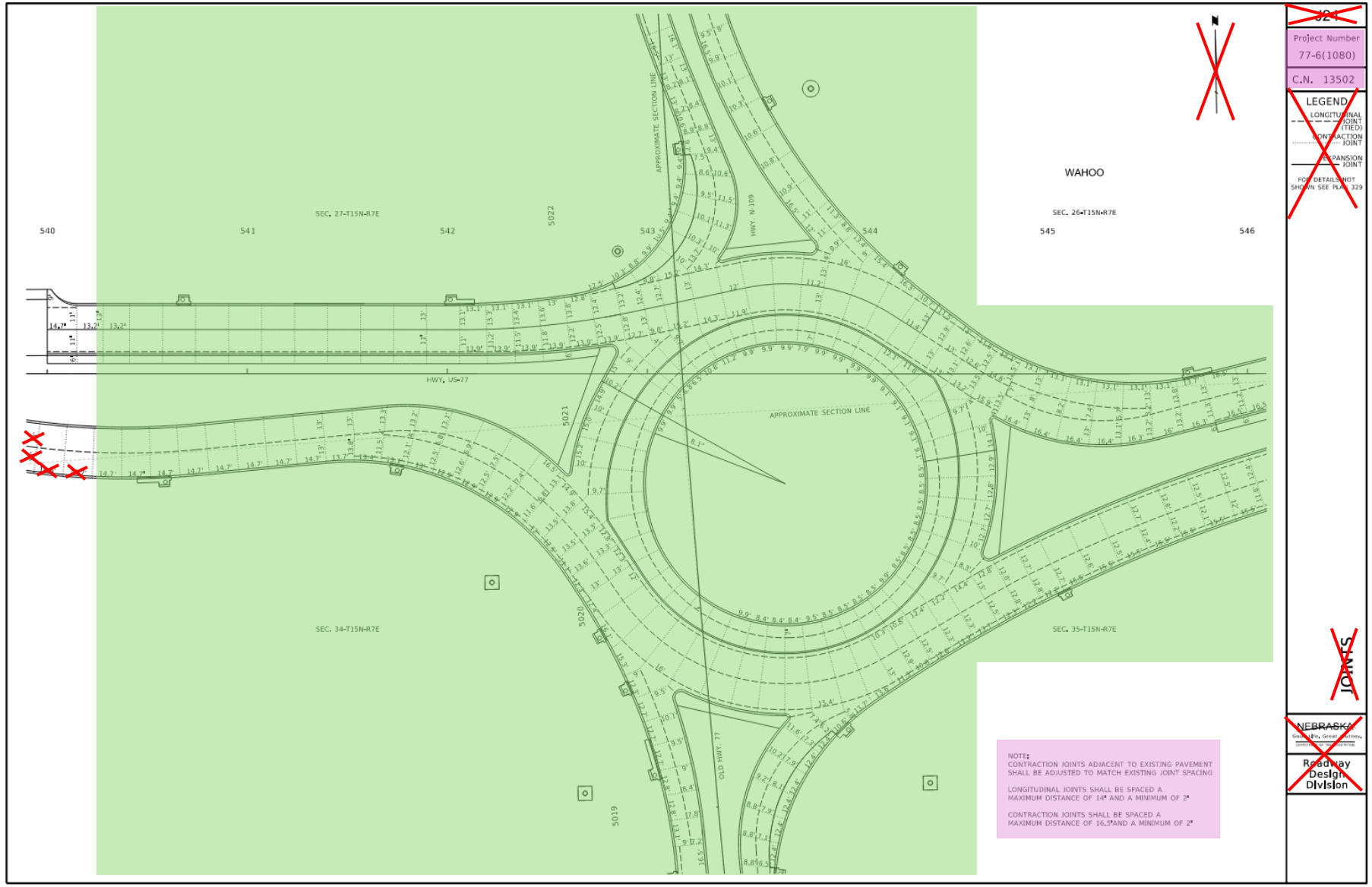
Modeling Notes:
- Contours of the project surfaces are viewable in Bentley Infrastructure Cloud

Joint Layout

Project Information Document
- Project identification
- Construction notes
- Department information

Information Derived from Model Viewer
- Joint line locations

Information not Included
- North arrow
- Sheet number
- Legend
- Sheet title
- Dimensions



Modeling Notes:
- Joint lines are drawn as 2D linestrings

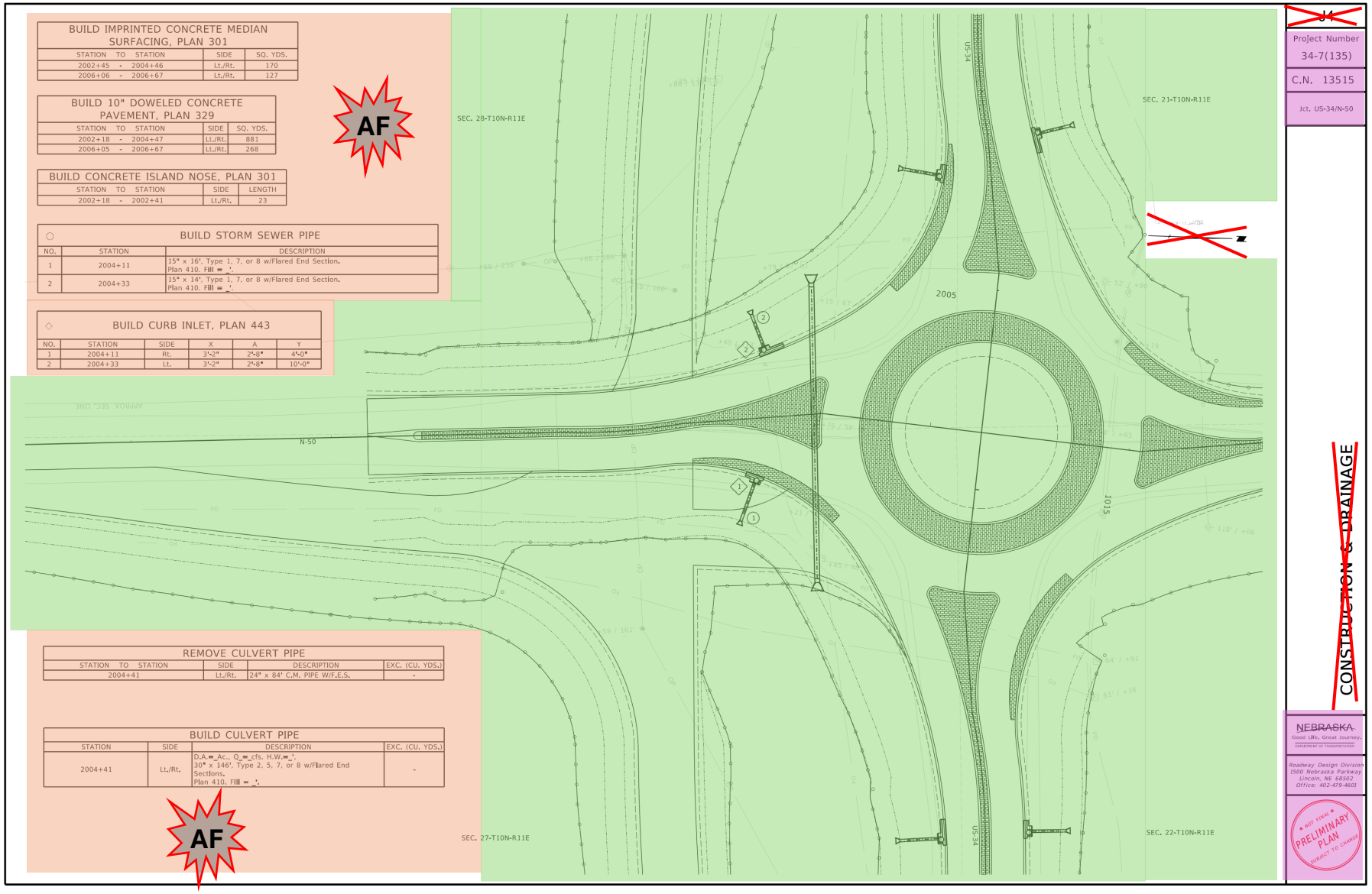
Drainage - Construction - Removal Plan

Project Information Document
- Project Identification
- Construction notes
- Department information

Information Derived from Model Viewer
- Drainage element locations
- Construction layout
- Removal areas

Model Element Attributes
- Drainage build data
- Construction build data
- Removal quantities

Information not Included
- Sheet title
- Sheet number
- Sheet name



AF

Alternate Data Format
- This tabular data has been exported and presented in Excel. The comps are included in the project documents.

Modeling Notes:
- The project drainage model, corridor models (construction), and removal model accurately represent the project's design intent
- All modeled element have custom properties (item types) that provide adequate identification

Erosion & Sediment Control

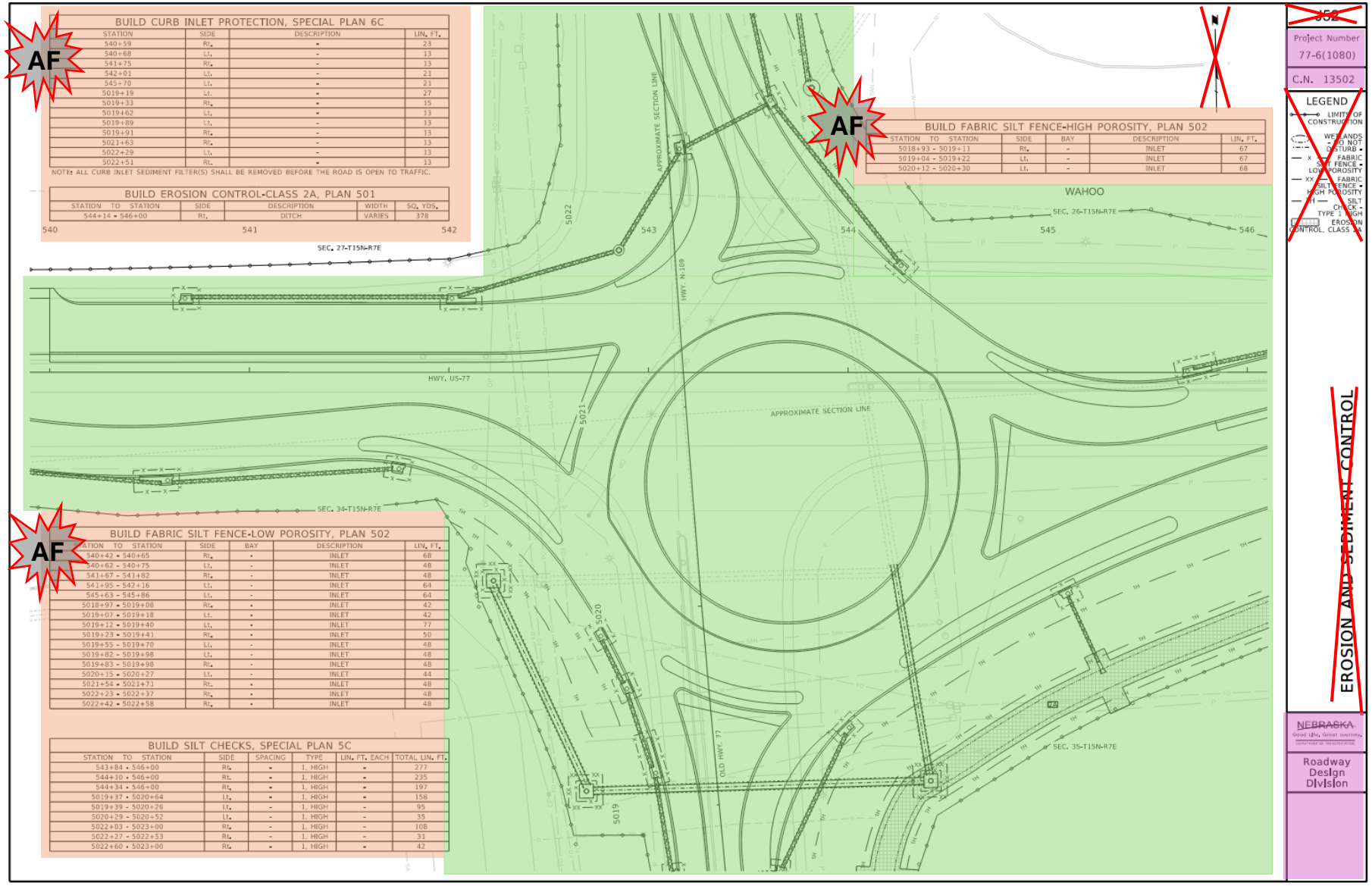
Project Information Document
- Project Identification
- Department information

Information Derived from Model Viewer
- Erosion Control lines and shapes
- Seeding shapes
- Topsoil Placement shapes

Model Element Attributes
- Build data

Information not Included
- North Arrow
- Legend
- Sheet number
- Sheet name

Alternate Data Format
- This tabular data has been exported and presented in Excel. The comps are included in the project documents.



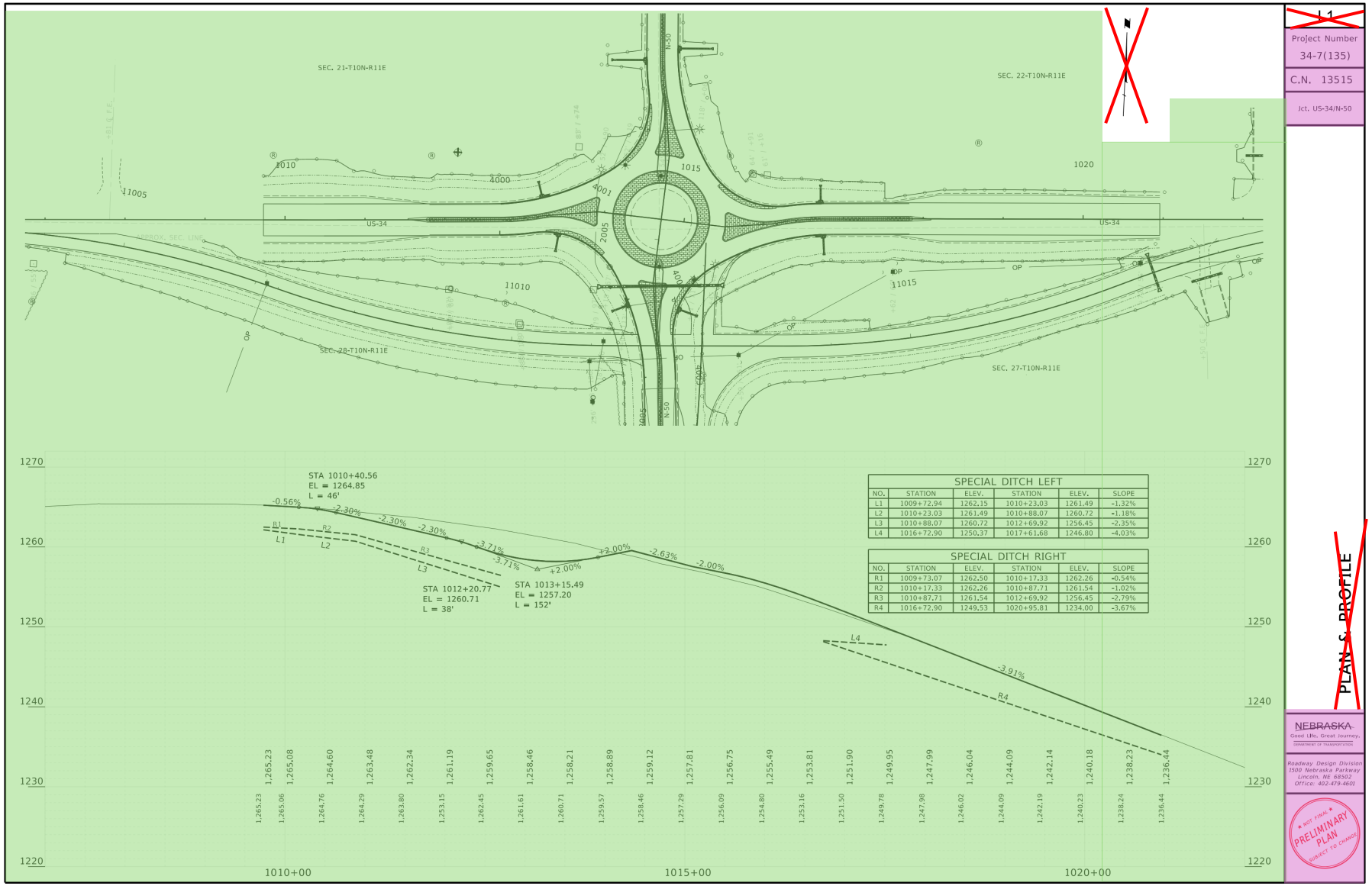
Modeling Notes:
- The erosion and sediment control elements are drawn in 2D. Shapes include a semi-transparent fill color.
- All shapes and lines have custom properties (item types) that provide adequate identification

Plan and Profile

Project Information Document
- Project Identification
- Department information

Information Derived from Model Viewer
- Profile data
- 2D Construction elements
- Limits of Construction

Information not Included
- North arrow
- Sheet title
- Sheet number



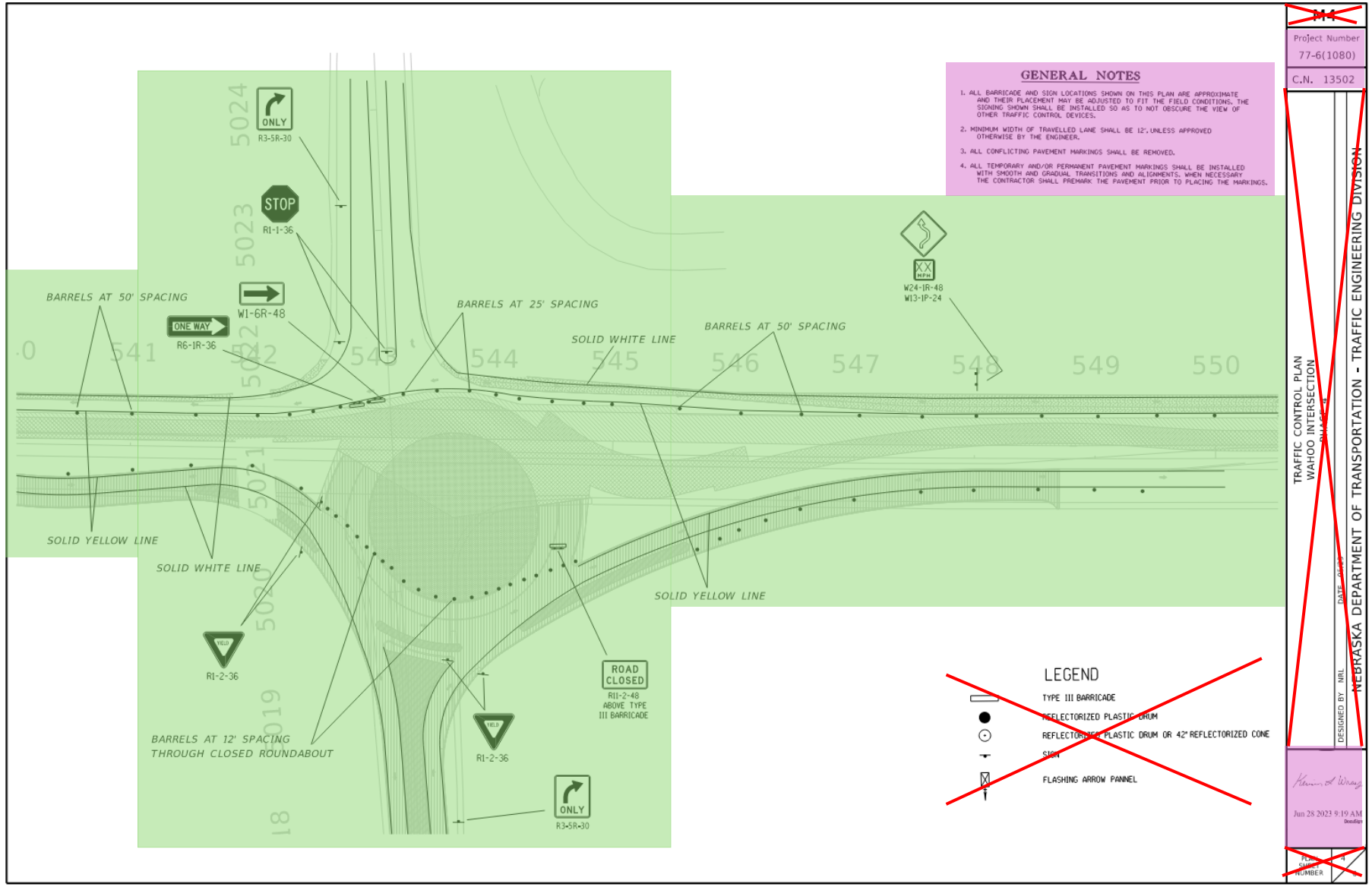
Modeling Notes:
- Profile data is stored within the alignment element

Traffic Control Plan

Project Information Document
- Project Identification
- General notes
- Department information

Information Derived from Model Viewer
- Sign Locations
- Sign Cells
- Barricades
- Temporary Pavement Markings

Information not Included
- Legend information
- Sheet title
- Sheet number



Modeling Notes:
- A saved view for each phase has been created in Bentley Infrastructure Cloud.
- Model Element attributes for each traffic control element call out the quantities based on number of construction days of each phase. Model Element Attributes have been exported and presented in Excel. The comps are included in the project documents.
- 2D Sign Cells are drawn in the model for visual reference

Sign Install Plan

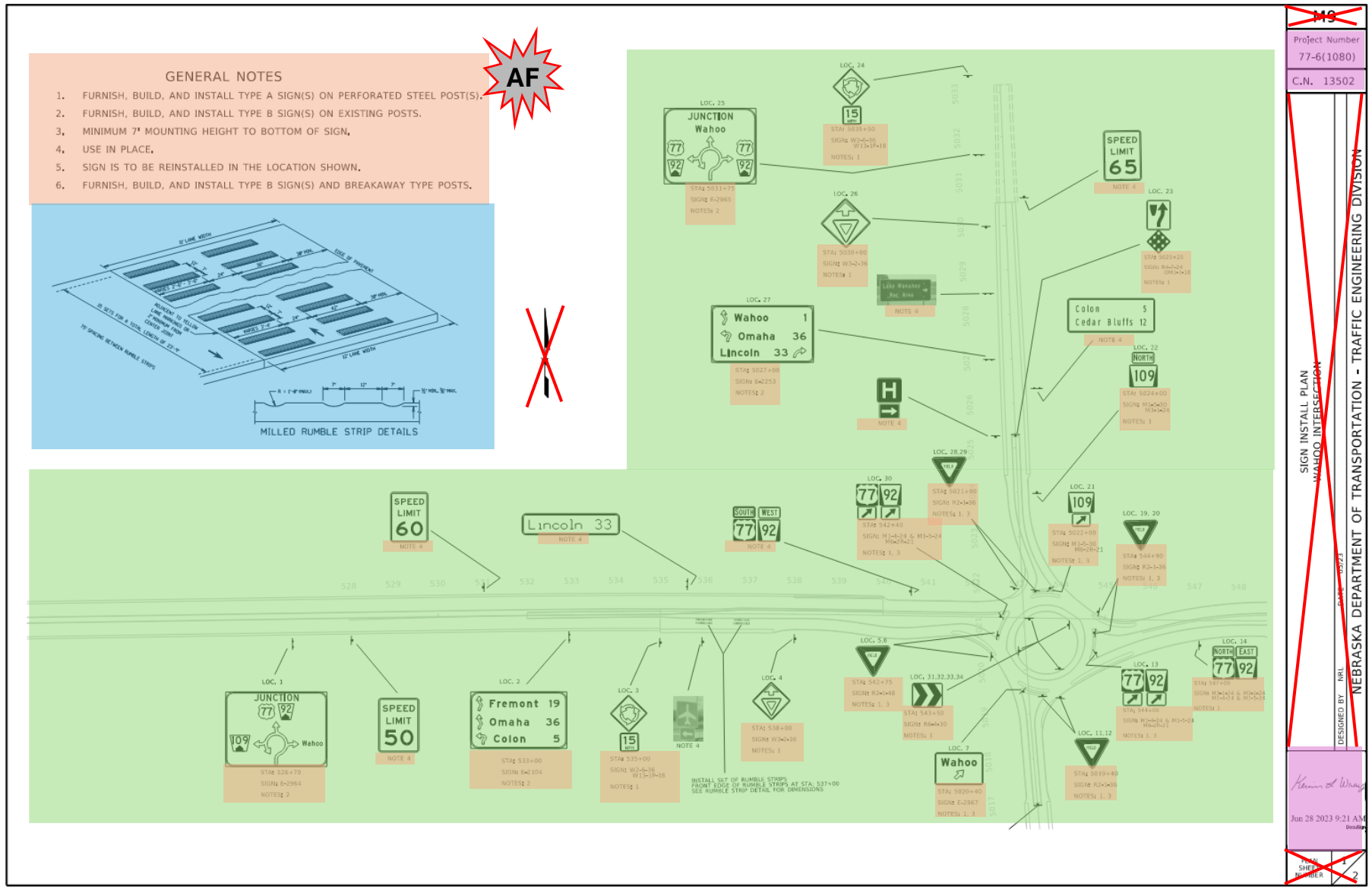
Project Information Document
- Project Identification
- Department information

Information Derived from Model Viewer
- Sign Locations
- Sign Cells

2D Data in Sheet Index
- Design details

Model Element Attributes
- Build data
- Sign ID's

Information not Included
- North arrow
- Sheet title
- Sheet number



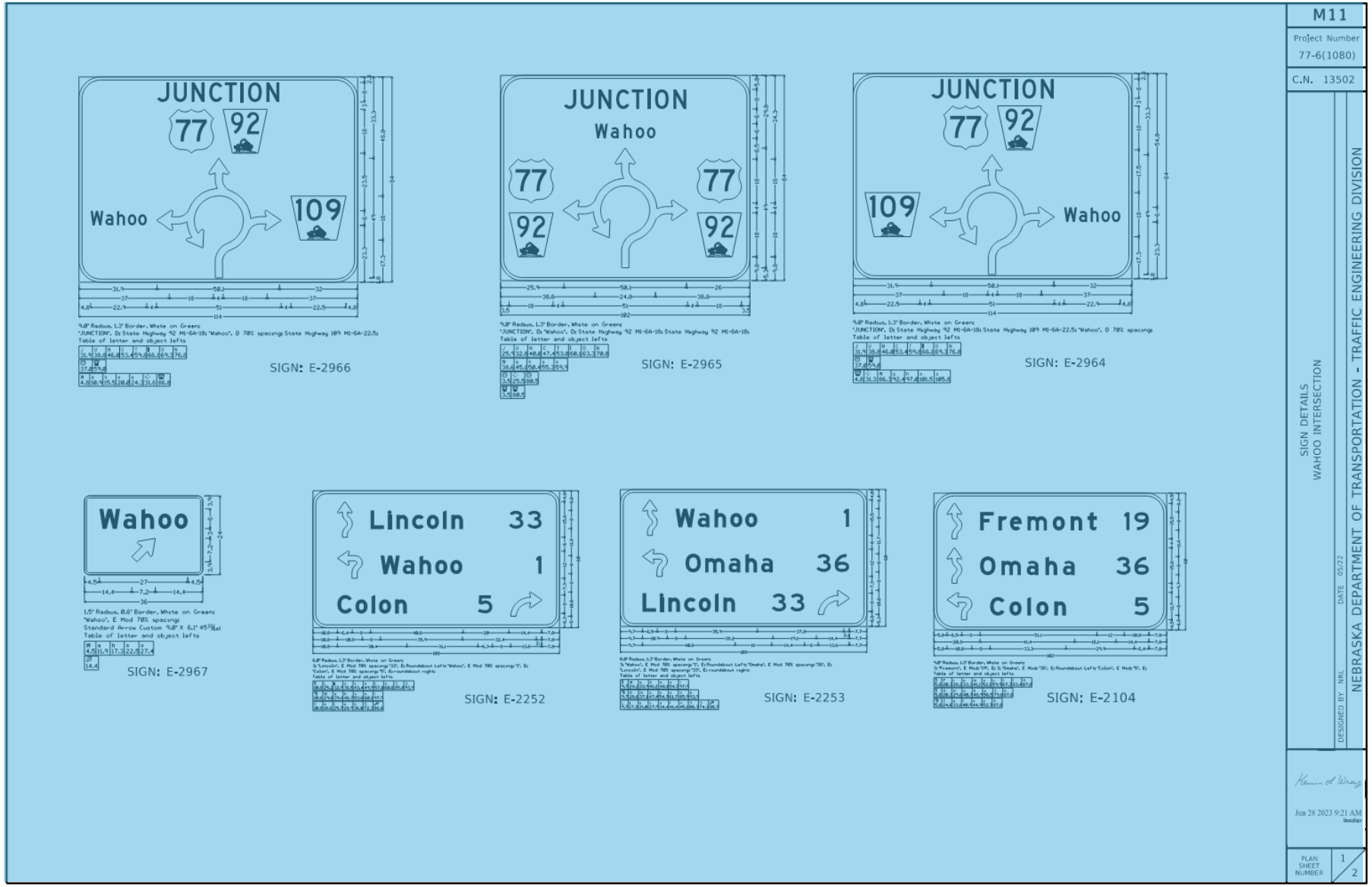
Alternate Data Format
- Model Element Attributes have been exported and presented in Excel. The comps are included in the project documents.

Modeling Notes:
- All modeled element have custom properties (item types) that provide adequate identification and call out the pay items and quantities. Model Element Attributes have been exported and presented in Excel. The comps are included in the project documents.
- 2D Sign Cells are drawn in the model for visual reference

Sign Details

2D Data in Sheet Index

- Design details and notes
- Sheet name
- Sheet Number
- Project identification
- Department Information



Modeling Notes:

- Details are placed in an OpenRoads Designer sheet model and added to the project's sheet index where it will be synchronized to Bentley Infrastructure Cloud

Sign Detail Table

2D Data in Sheet Index

- Design details and notes
- Sheet name
- Sheet Number
- Project identification
- Department Information

AF

Location	MILE MARKER / STATION	SIGN ID	TYPE OF SIGN						GALVANIZED STEEL BEAM POSTS									PERFORATED SQUARE STEEL TUBE POSTS (2")		NON-PERFORATED SQUARED STEEL TUBE POSTS (4")	
			TYPE A	AREA (SQ. FT.)	TYPE B	AREA (SQ. FT.)	TYPE C	AREA (SQ. FT.)	POST NO.	NO. OF POSTS	SIZE	STEEL LENGTHS	STRUCTURAL STEEL LBS.	FOOTINGS				NO. OF POSTS	STEEL LENGTHS	NO. OF POSTS	STEEL LENGTHS
														NO.	DIA.	DEPTH	CUBIC YARDS CONCRETE				
1	526+70	E-2964			X	66.5			Sign is to be mounted on existing posts												
2	533+00	E-2104			X	42.5			Sign is to be mounted on existing posts												
3	533+00	W2-6-36 & W13-1P-18	X	11.25														1	14		
4	538+00	W3-2-36	X	9.00														1	13		
5	542+75	R2-1-48	X	7.00														1	14		
6	542+75	R2-1-48	X	7.00														1	14		
7	5019+50	E-2967	X	6.00														1	12		
8	5017+00	R4-7-24 & OM1-1-18	X	7.25														1	13		
9	5006+40	W2-6-36 & W13-1P-18	X	11.25														1	13		
10	5011+00	W3-2-36	X	9.00														1	12.5		
11	5020+40	R2-1-48	X	7.00														1	14		
12	5020+40	R2-1-48	X	7.00														1	14		
13	544+75	M1-4-24, M1-5-24, M6-2R-21	X	12.40														1	13		
14	547+00	M3-1-24 M3-2-24 M1-4-24 M1-5-24	X	12.00														1	13		
15	561+00	W2-6-36 & W13-1P-18	X	11.25														1	13		
16	557+00	E-2966			X	66.5			I	2	W6x15	18'/19'	555	2	24"	4.5'	1.04				
17	549+00	W3-2-36	X	9.00														1	12.5		
18	551+50	E-2252			X	45			I	2	W6x15	17'/18'	525	2	24"	4.5'	1.04				
19	544+90	R2-1-48	X	7.00														1	13.5		
20	544+90	R2-1-48	X	7.00														1	13.5		
21	5022+00	M1-5-30 & M6-2R-21	X	7.20														1	13.0		
22	5024+00	M1-5-30 & M3-1-24	X	7.00														1	13.0		
23	5025+25	R4-7-24 & OM1-1-18	X	7.25														1	13.0		
24	5035+50	W2-6-36 & W13-1P-18	X	11.25														1	13.0		
25	5031+75	E-2965			X	59.5			Sign is to be mounted on existing posts												
26	5030+00	W3-2-36	X	9.00														1	12.5		
27	2027+00	E-2253			X	45			Sign is to be mounted on existing posts												
28	5021+90	R2-1-48	X	7.00														1	13.5		
29	5021+90	R2-1-48	X	7.00														1	13.5		
30	542+70	M1-4-24, M1-5-24, M6-2R-21	X	12.40														1	13.0		
31	543+50	R6-4-30	X	5.00														1	12.0		
32	543+50	R6-4-30	X	5.00														1	12.0		
33	543+50	R6-4-30	X	5.00														1	12.0		
34	543+50	R6-4-30	X	5.00														1	12.0		
TOTALS				228.50		325.0							1080.0				2.1	28.0	364.5		

M12

Project Number 77-6(1080)

C.N. 13502

SIGN DETAILS
WAHOO INTERSECTION

DESIGNED BY NRL DATE 05/22

NEBRASKA DEPARTMENT OF TRANSPORTATION - TRAFFIC ENGINEERING DIVISION

Jun 28 2023 9:21 AM

PLAN SHEET NUMBER 2/2

AF

Alternate Data Format

- This tabular data has been exported and presented in Excel. The comps are included in the project documents.

Modeling Notes:

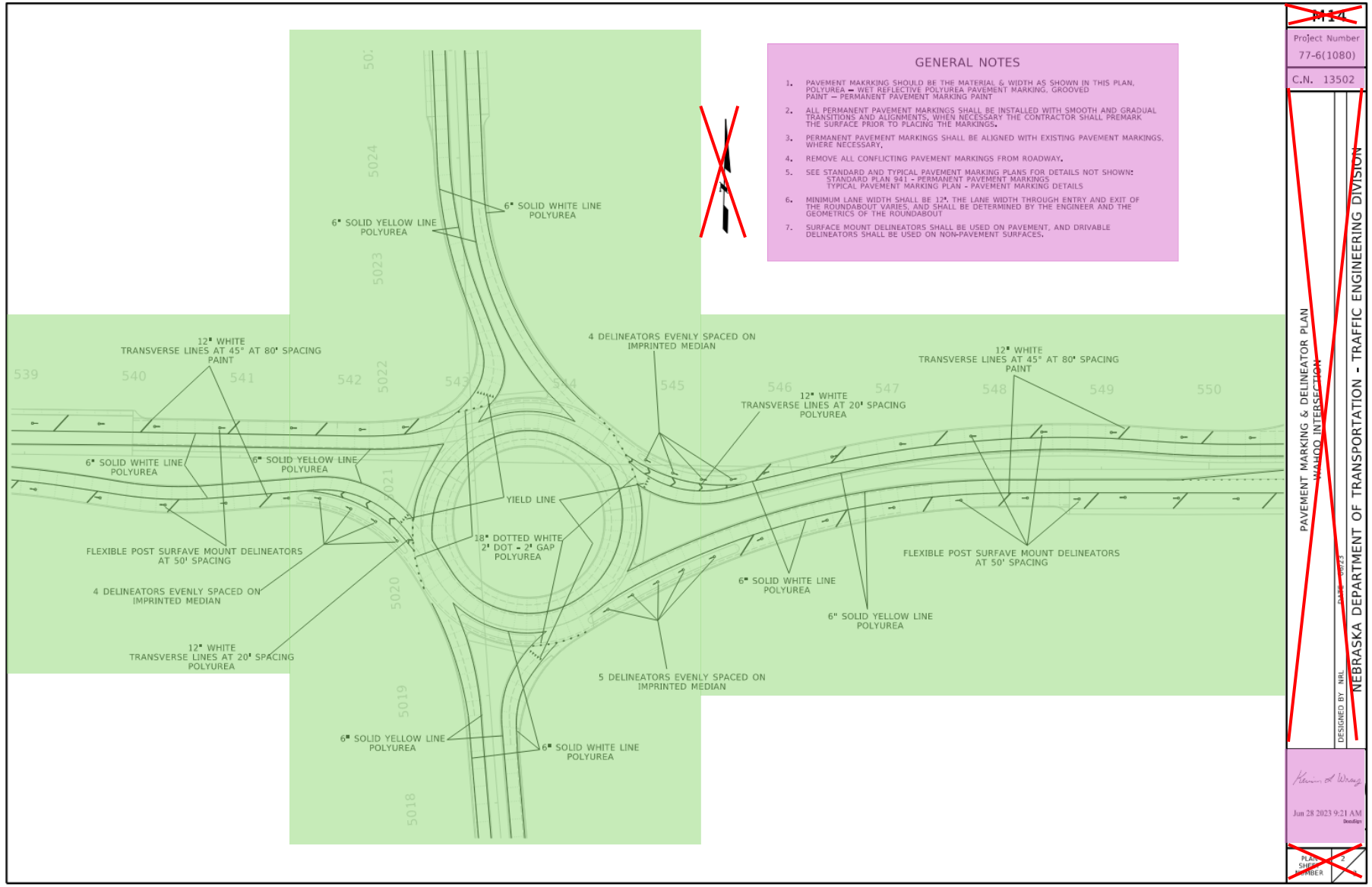
- Details are placed in an OpenRoads Designer sheet model and added to the project's sheet index where it has been synchronized to Bentley Infrastructure Cloud

Pavement Marking and Delineation Plan

Project Information Document
- Project Identification
- Department information
- General notes

Information Derived from Model Viewer
- Pavement markings

Information not Included
- Sheet title
- Sheet number



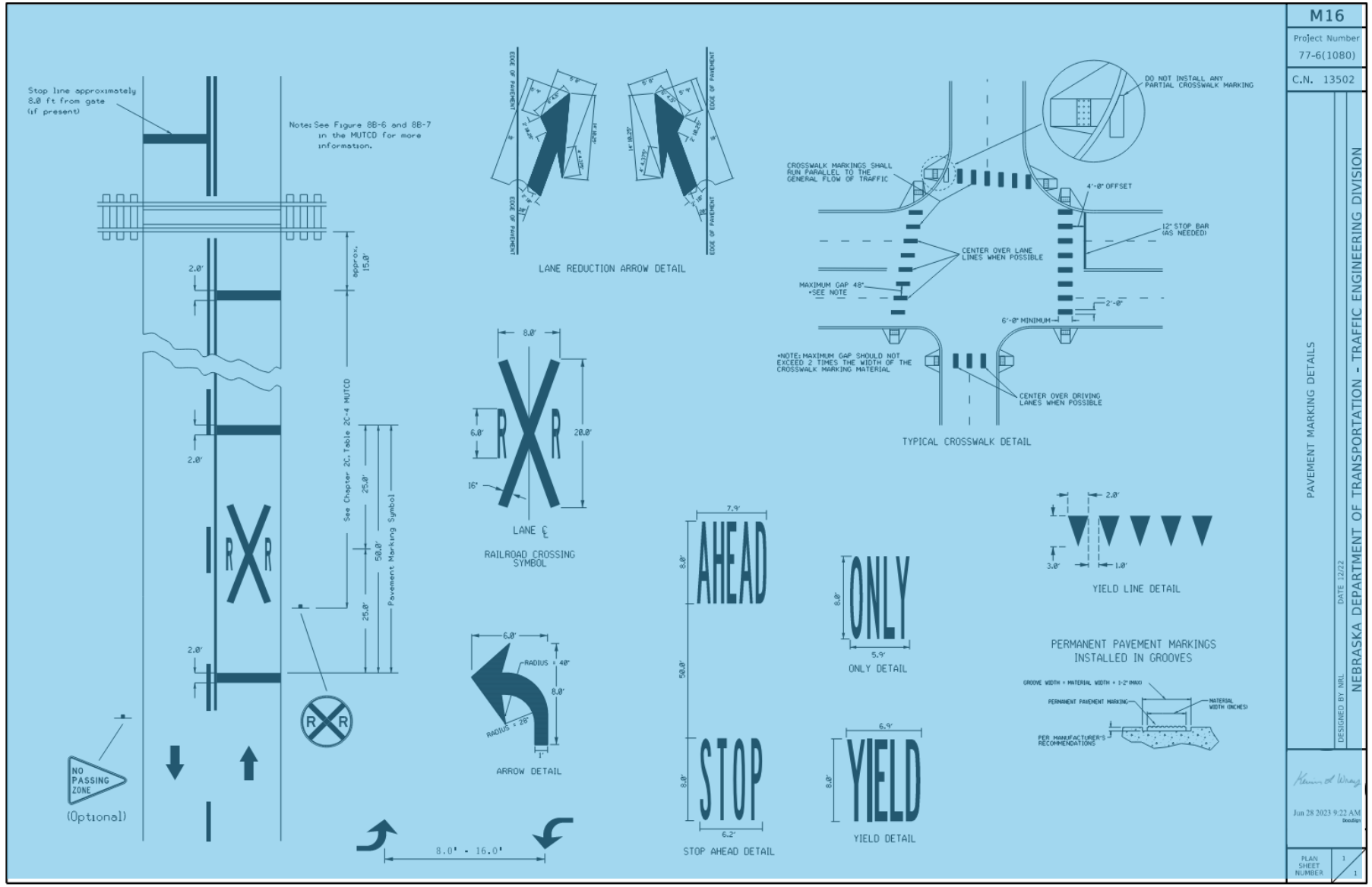
Modeling Notes:

- Model Element attributes for each pavement marking linestring calls out the pay items and quantities for each individual linestring. Model Element Attributes have been exported and presented in Excel. The comps are included in the project documents.

Pavement Marking Details

2D Data in Sheet Index

- Design details and notes
- Sheet name
- Sheet Number
- Project identification
- Department Information



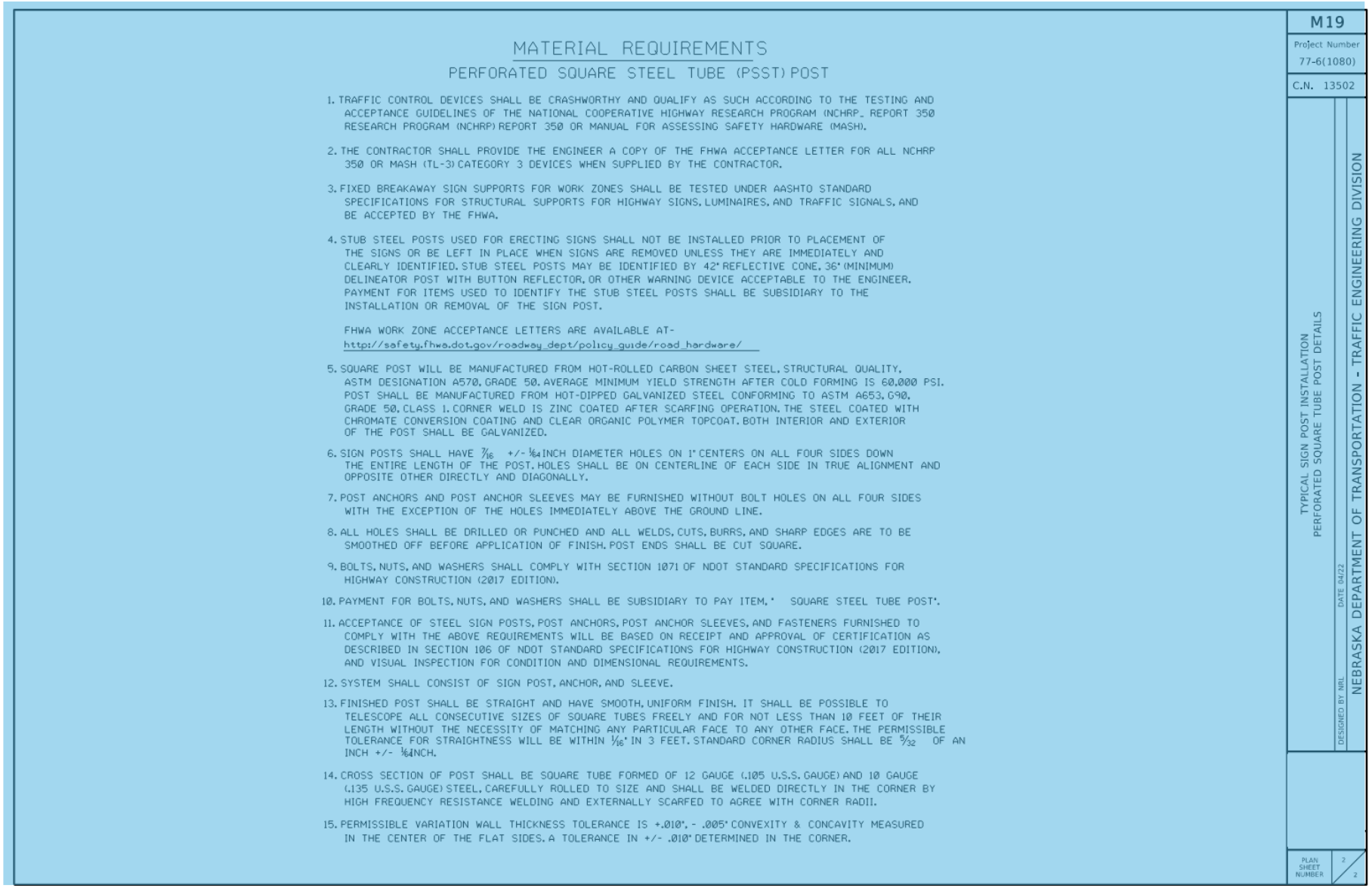
Modeling Notes:

- Details are placed in an OpenRoads Designer sheet model and added to the project's sheet index where it is synchronized to Bentley Infrastructure Cloud

Typical Sign Post Installation

2D Data in Sheet Index

- Design details and notes
- Sheet name
- Sheet Number
- Project identification
- Department Information



MATERIAL REQUIREMENTS

PERFORATED SQUARE STEEL TUBE (PSST) POST

1. TRAFFIC CONTROL DEVICES SHALL BE CRASHWORTHY AND QUALIFY AS SUCH ACCORDING TO THE TESTING AND ACCEPTANCE GUIDELINES OF THE NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM (NCHRP_ REPORT 350 RESEARCH PROGRAM (NCHRP) REPORT 350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

2. THE CONTRACTOR SHALL PROVIDE THE ENGINEER A COPY OF THE FHWA ACCEPTANCE LETTER FOR ALL NCHRP 350 OR MASH (TL-3) CATEGORY 3 DEVICES WHEN SUPPLIED BY THE CONTRACTOR.

3. FIXED BREAKAWAY SIGN SUPPORTS FOR WORK ZONES SHALL BE TESTED UNDER AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, AND BE ACCEPTED BY THE FHWA.

4. STUB STEEL POSTS USED FOR ERECTING SIGNS SHALL NOT BE INSTALLED PRIOR TO PLACEMENT OF THE SIGNS OR BE LEFT IN PLACE WHEN SIGNS ARE REMOVED UNLESS THEY ARE IMMEDIATELY AND CLEARLY IDENTIFIED. STUB STEEL POSTS MAY BE IDENTIFIED BY 42" REFLECTIVE CONE, 36" (MINIMUM) DELINEATOR POST WITH BUTTON REFLECTOR, OR OTHER WARNING DEVICE ACCEPTABLE TO THE ENGINEER. PAYMENT FOR ITEMS USED TO IDENTIFY THE STUB STEEL POSTS SHALL BE SUBSIDIARY TO THE INSTALLATION OR REMOVAL OF THE SIGN POST.

   FHWA WORK ZONE ACCEPTANCE LETTERS ARE AVAILABLE AT-
   http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/

5. SQUARE POST WILL BE MANUFACTURED FROM HOT-ROLLED CARBON SHEET STEEL, STRUCTURAL QUALITY, ASTM DESIGNATION A570, GRADE 50. AVERAGE MINIMUM YIELD STRENGTH AFTER COLD FORMING IS 60,000 PSI. POST SHALL BE MANUFACTURED FROM HOT-DIPPED GALVANIZED STEEL CONFORMING TO ASTM A653, G90, GRADE 50, CLASS 1. CORNER WELD IS ZINC COATED AFTER SCARFING OPERATION. THE STEEL COATED WITH CHROMATE CONVERSION COATING AND CLEAR ORGANIC POLYMER TOPCOAT. BOTH INTERIOR AND EXTERIOR OF THE POST SHALL BE GALVANIZED.

6. SIGN POSTS SHALL HAVE 7/16 +/- 1/64 INCH DIAMETER HOLES ON 1" CENTERS ON ALL FOUR SIDES DOWN THE ENTIRE LENGTH OF THE POST. HOLES SHALL BE ON CENTERLINE OF EACH SIDE IN TRUE ALIGNMENT AND OPPOSITE OTHER DIRECTLY AND DIAGONALLY.

7. POST ANCHORS AND POST ANCHOR SLEEVES MAY BE FURNISHED WITHOUT BOLT HOLES ON ALL FOUR SIDES WITH THE EXCEPTION OF THE HOLES IMMEDIATELY ABOVE THE GROUND LINE.

8. ALL HOLES SHALL BE DRILLED OR PUNCHED AND ALL WELDS, CUTS, BURRS, AND SHARP EDGES ARE TO BE SMOOTHED OFF BEFORE APPLICATION OF FINISH. POST ENDS SHALL BE CUT SQUARE.

9. BOLTS, NUTS, AND WASHERS SHALL COMPLY WITH SECTION 1071 OF NDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2017 EDITION).

10. PAYMENT FOR BOLTS, NUTS, AND WASHERS SHALL BE SUBSIDIARY TO PAY ITEM, " SQUARE STEEL TUBE POST".

11. ACCEPTANCE OF STEEL SIGN POSTS, POST ANCHORS, POST ANCHOR SLEEVES, AND FASTENERS FURNISHED TO COMPLY WITH THE ABOVE REQUIREMENTS WILL BE BASED ON RECEIPT AND APPROVAL OF CERTIFICATION AS DESCRIBED IN SECTION 106 OF NDOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2017 EDITION), AND VISUAL INSPECTION FOR CONDITION AND DIMENSIONAL REQUIREMENTS.

12. SYSTEM SHALL CONSIST OF SIGN POST, ANCHOR, AND SLEEVE.

13. FINISHED POST SHALL BE STRAIGHT AND HAVE SMOOTH, UNIFORM FINISH. IT SHALL BE POSSIBLE TO TELESCOPE ALL CONSECUTIVE SIZES OF SQUARE TUBES FREELY AND FOR NOT LESS THAN 10 FEET OF THEIR LENGTH WITHOUT THE NECESSITY OF MATCHING ANY PARTICULAR FACE TO ANY OTHER FACE. THE PERMISSIBLE TOLERANCE FOR STRAIGHTNESS WILL BE WITHIN 1/16" IN 3 FEET. STANDARD CORNER RADIUS SHALL BE 5/32 OF AN INCH +/- 1/64INCH.

14. CROSS SECTION OF POST SHALL BE SQUARE TUBE FORMED OF 12 GAUGE (.105 U.S.S. GAUGE) AND 10 GAUGE (.135 U.S.S. GAUGE) STEEL, CAREFULLY ROLLED TO SIZE AND SHALL BE WELDED DIRECTLY IN THE CORNER BY HIGH FREQUENCY RESISTANCE WELDING AND EXTERNALLY SCARFED TO AGREE WITH CORNER RADII.

15. PERMISSIBLE VARIATION WALL THICKNESS TOLERANCE IS +.010", - .005" CONVEXITY & CONCAVITY MEASURED IN THE CENTER OF THE FLAT SIDES. A TOLERANCE IN +/- .010" DETERMINED IN THE CORNER.

M19

Project Number
77-6(1080)

C.N. 13502

TYPICAL SIGN POST INSTALLATION
PERFORATED SQUARE TUBE POST DETAILS

DESIGNED BY NRL

DATE 04/22

NEBRASKA DEPARTMENT OF TRANSPORTATION - TRAFFIC ENGINEERING DIVISION

PLAN SHEET NUMBER 2/2

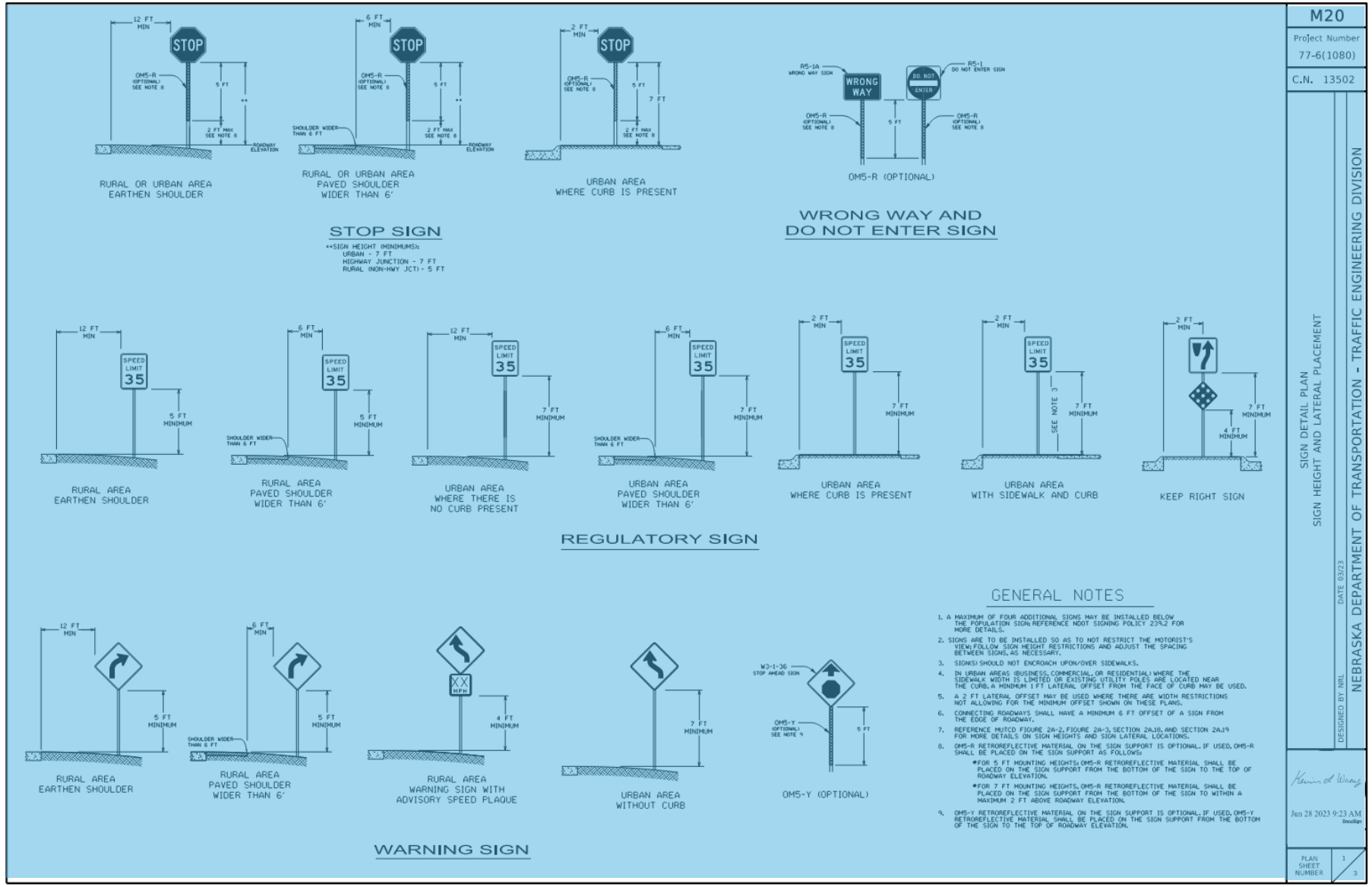
Modeling Notes:

- Details are placed in an OpenRoads Designer sheet model and added to the project's sheet index where it is synchronized to Bentley Infrastructure Cloud

Sign Detail Plan

2D Data in Sheet Index

- Design details and notes
- Sheet name
- Sheet Number
- Project identification
- Department Information



Modeling Notes:

- Details are placed in an OpenRoads Designer sheet model and added to the project's sheet index where it is synchronized to Bentley Infrastructure Cloud

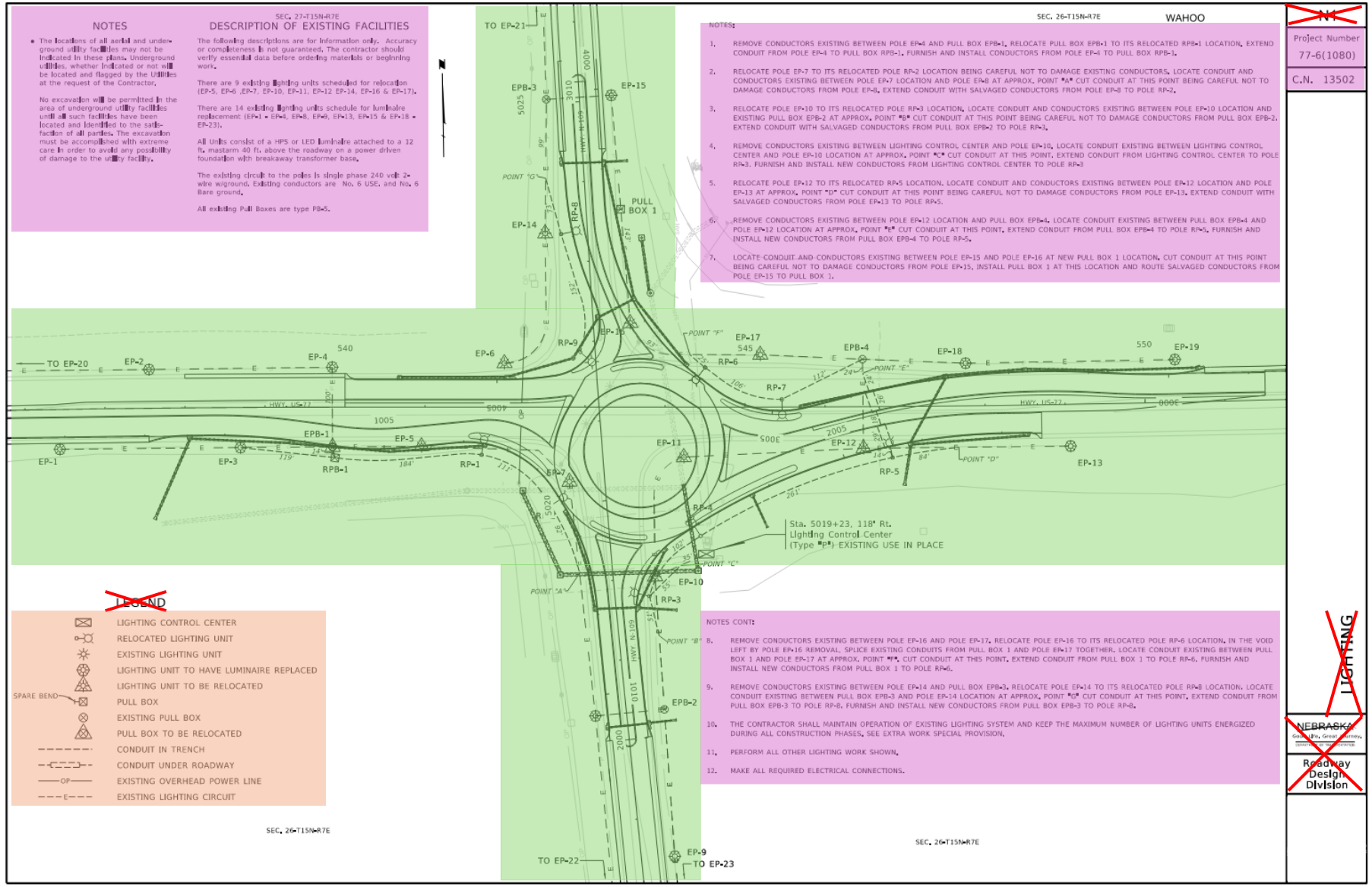
Lighting Plan

Project Information Document
- Project Identification
- General notes
- Department information

Information Derived from Model Viewer
- Lighting design element locations

Model Element Attributes
- Lighting design element data

Information not Included
- Sheet title
- Legend
- Sheet number

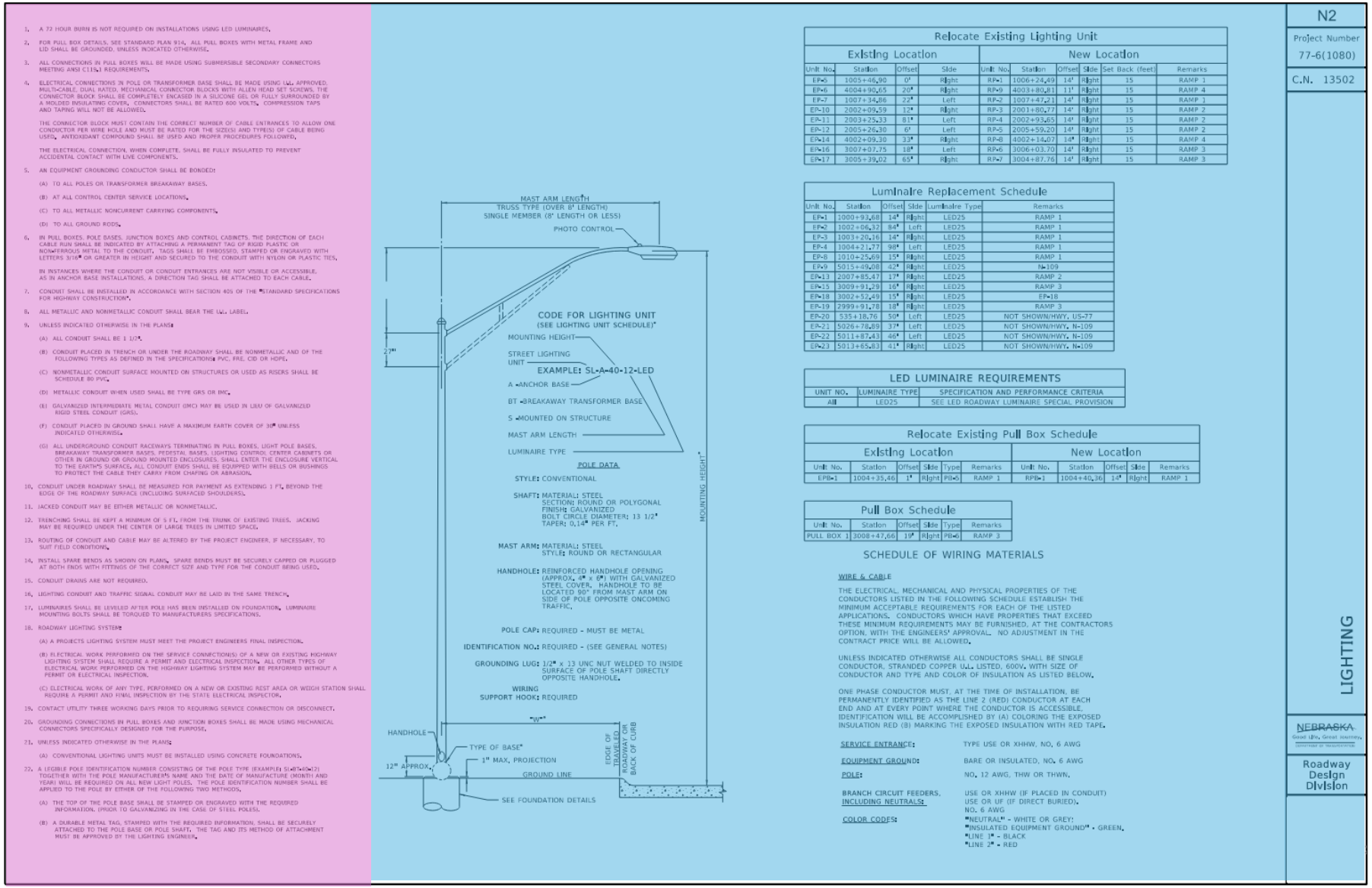


Modeling Notes:
- All Lighting elements and conduits are 2D lines or cells
- Model Element attributes for each lighting element calls out the pay items and quantities for each element. Model Element Attributes have been exported and presented in Excel. The comps are included in the project documents.

Lighting Details

2D Data in Sheet Index
- Design details and notes
- Schedules
- Sheet name
- Sheet Number
- Project identification
- Department Information

Project Information Document
- General notes



1. A 72 HOUR BURN IS NOT REQUIRED ON INSTALLATIONS USING LED LUMINAIRES.
2. FOR PULL BOX DETAILS, SEE STANDARD PLAN 914. ALL PULL BOXES WITH METAL FRAME AND LID SHALL BE GROUNDED, UNLESS INDICATED OTHERWISE.
3. ALL CONNECTIONS IN PULL BOXES WILL BE MADE USING SUBMERSIBLE SECONDARY CONNECTORS MEETING ANSI C119.1 REQUIREMENTS.
4. ELECTRICAL CONNECTIONS IN POLE OR TRANSFORMER BASE SHALL BE MADE USING U.L. APPROVED, MULTI-CABLE, DUAL RATED, MECHANICAL CONNECTOR BLOCKS WITH ALLEN HEAD SET SCREWS. THE CONNECTOR BLOCK SHALL BE COMPLETELY ENCASED IN A SILICONE GEL OR FULLY SURROUNDED BY A MOLDED INSULATING COVER. CONNECTORS SHALL BE RATED 600 VOLTS. COMPRESSION TAPS AND TAPING WILL NOT BE ALLOWED.

   THE CONNECTOR BLOCK MUST CONTAIN THE CORRECT NUMBER OF CABLE ENTRANCES TO ALLOW ONE CONDUCTOR PER WIRE HOLE AND MUST BE RATED FOR THE SIZE(S) AND TYPE(S) OF CABLE BEING USED. ANTIOXIDANT COMPOUND SHALL BE USED AND PROPER PROCEDURES FOLLOWED.

   THE ELECTRICAL CONNECTION, WHEN COMPLETE, SHALL BE FULLY INSULATED TO PREVENT ACCIDENTAL CONTACT WITH LIVE COMPONENTS.
5. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE BONDED:

   (A) TO ALL POLES OR TRANSFORMER BREAKAWAY BASES.

   (B) AT ALL CONTROL CENTER SERVICE LOCATIONS.

   (C) TO ALL METALLIC NONCURRENT CARRYING COMPONENTS.

   (D) TO ALL GROUND RODS.
6. IN PULL BOXES, POLE BASES, JUNCTION BOXES AND CONTROL CABINETS, THE DIRECTION OF EACH CABLE RUN SHALL BE INDICATED BY ATTACHING A PERMANENT TAG OF RIGID PLASTIC OR NONFERROUS METAL TO THE CONDUIT. TAGS SHALL BE EMBOSSED, STAMPED OR ENGRAVED WITH LETTERS 3/16" OR GREATER IN HEIGHT AND SECURED TO THE CONDUIT WITH NYLON OR PLASTIC TIES.

   IN INSTANCES WHERE THE CONDUIT OR CONDUIT ENTRANCES ARE NOT VISIBLE OR ACCESSIBLE, AS IN ANCHOR BASE INSTALLATIONS, A DIRECTION TAG SHALL BE ATTACHED TO EACH CABLE.
7. CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 405 OF THE "STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION".
8. ALL METALLIC AND NONMETALLIC CONDUIT SHALL BEAR THE U.L. LABEL.
9. UNLESS INDICATED OTHERWISE IN THE PLANS:

   (A) ALL CONDUIT SHALL BE 1 1/2".

   (B) CONDUIT PLACED IN TRENCH OR UNDER THE ROADWAY SHALL BE NONMETALLIC AND OF THE FOLLOWING TYPES AS DEFINED IN THE SPECIFICATIONS: PVC, FRE, CID OR HDPE.

   (C) NONMETALLIC CONDUIT SURFACE MOUNTED ON STRUCTURES OR USED AS RISERS SHALL BE SCHEDULE 80 PVC.

   (D) METALLIC CONDUIT WHEN USED SHALL BE TYPE GRS OR IMC.

   (E) GALVANIZED INTERMEDIATE METAL CONDUIT (IMC) MAY BE USED IN LIEU OF GALVANIZED RIGID STEEL CONDUIT (GRS).

   (F) CONDUIT PLACED IN GROUND SHALL HAVE A MAXIMUM EARTH COVER OF 30" UNLESS INDICATED OTHERWISE.

   (G) ALL UNDERGROUND CONDUIT RACEWAYS TERMINATING IN PULL BOXES, LIGHT POLE BASES, BREAKAWAY TRANSFORMER BASES, PEDESTAL BASES, LIGHTING CONTROL CENTER CABINETS OR OTHER IN GROUND OR GROUND MOUNTED ENCLOSURES, SHALL ENTER THE ENCLOSURE VERTICAL TO THE EARTH'S SURFACE. ALL CONDUIT ENDS SHALL BE EQUIPPED WITH BELLS OR BUSHINGS TO PROTECT THE CABLE THEY CARRY FROM CHAFING OR ABRASION.
10. CONDUIT UNDER ROADWAY SHALL BE MEASURED FOR PAYMENT AS EXTENDING 1 FT. BEYOND THE EDGE OF THE ROADWAY SURFACE (INCLUDING SURFACED SHOULDERS).
11. JACKED CONDUIT MAY BE EITHER METALLIC OR NONMETALLIC.
12. TRENCHING SHALL BE KEPT A MINIMUM OF 5 FT. FROM THE TRUNK OF EXISTING TREES. JACKING MAY BE REQUIRED UNDER THE CENTER OF LARGE TREES IN LIMITED SPACE.
13. ROUTING OF CONDUIT AND CABLE MAY BE ALTERED BY THE PROJECT ENGINEER, IF NECESSARY, TO SUIT FIELD CONDITION.
14. INSTALL SPARE BENDS AS SHOWN ON PLANS. SPARE BENDS MUST BE SECURELY CAPPED OR PLUGGED AT BOTH ENDS WITH FITTINGS OF THE CORRECT SIZE AND TYPE FOR THE CONDUIT BEING USED.
15. CONDUIT DRAINS ARE NOT REQUIRED.
16. LIGHTING CONDUIT AND TRAFFIC SIGNAL CONDUIT MAY BE LAID IN THE SAME TRENCH.
17. LUMINAIRES SHALL BE LEVELED AFTER POLE HAS BEEN INSTALLED ON FOUNDATION. LUMINAIRE MOUNTING BOLTS SHALL BE TORQUED TO MANUFACTURERS SPECIFICATIONS.
18. ROADWAY LIGHTING SYSTEM:

   (A) A PROJECTS LIGHTING SYSTEM MUST MEET THE PROJECT ENGINEERS FINAL INSPECTION.

   (B) ELECTRICAL WORK PERFORMED ON THE SERVICE CONNECTION(S) OF A NEW OR EXISTING HIGHWAY LIGHTING SYSTEM SHALL REQUIRE A PERMIT AND ELECTRICAL INSPECTION. ALL OTHER TYPES OF ELECTRICAL WORK PERFORMED ON THE HIGHWAY LIGHTING SYSTEM MAY BE PERFORMED WITHOUT A PERMIT OR ELECTRICAL INSPECTION.

   (C) ELECTRICAL WORK OF ANY TYPE, PERFORMED ON A NEW OR EXISTING REST AREA OR WEIGH STATION SHALL REQUIRE A PERMIT AND FINAL INSPECTION BY THE STATE ELECTRICAL INSPECTOR.
19. CONTACT UTILITY THREE WORKING DAYS PRIOR TO REQUIRING SERVICE CONNECTION OR DISCONNECT.
20. GROUNDING CONNECTIONS IN PULL BOXES AND JUNCTION BOXES SHALL BE MADE USING MECHANICAL CONNECTORS SPECIFICALLY DESIGNED FOR THE PURPOSE.
21. UNLESS INDICATED OTHERWISE IN THE PLANS:

   (A) CONVENTIONAL LIGHTING UNITS MUST BE INSTALLED USING CONCRETE FOUNDATIONS.
22. A LEGIBLE POLE IDENTIFICATION NUMBER CONSISTING OF THE POLE TYPE (EXAMPLE: SL-87-40-12) TOGETHER WITH THE POLE MANUFACTURER'S NAME AND THE DATE OF MANUFACTURE (MONTH AND YEAR) WILL BE REQUIRED ON ALL NEW LIGHT POLES. THE POLE IDENTIFICATION NUMBER SHALL BE APPLIED TO THE POLE BY EITHER OF THE FOLLOWING TWO METHODS.

   (A) THE TOP OF THE POLE BASE SHALL BE STAMPED OR ENGRAVED WITH THE REQUIRED INFORMATION. (PRIOR TO GALVANIZING IN THE CASE OF STEEL POLES).

   (B) A DURABLE METAL TAG, STAMPED WITH THE REQUIRED INFORMATION, SHALL BE SECURELY ATTACHED TO THE POLE BASE OR POLE SHAFT. THE TAG AND ITS METHOD OF ATTACHMENT MUST BE APPROVED BY THE LIGHTING ENGINEER.

Relocate Existing Lighting Unit

Existing Location				New Location					
Unit No.	Station	Offset	Side	Unit No.	Station	Offset	Side	Set Back (feet)	Remarks
EP-5	1005+46,90	0'	Right	RP-1	1006+24,49	14'	Right	15	RAMP 1
EP-6	4004+90,65	20'	Right	RP-9	4003+80,81	11'	Right	15	RAMP 4
EP-7	1007+34,86	22'	Left	RP-2	1007+47,21	14'	Right	15	RAMP 1
EP-10	2002+09,59	12'	Right	RP-3	2001+80,77	14'	Right	15	RAMP 2
EP-11	2003+25,33	81'	Left	RP-4	2002+93,65	14'	Right	15	RAMP 2
EP-12	2005+26,30	6'	Left	RP-5	2005+59,20	14'	Right	15	RAMP 2
EP-14	4002+09,30	33'	Right	RP-8	4002+14,07	14'	Right	15	RAMP 4
EP-16	3007+07,75	18'	Left	RP-6	3006+03,70	14'	Right	15	RAMP 3
EP-17	3005+39,02	65'	Right	RP-7	3004+87,76	14'	Right	15	RAMP 3

Luminaire Replacement Schedule

Unit No.	Station	Offset	Side	Luminaire Type	Remarks
EP-1	1000+93,68	14'	Right	LED25	RAMP 1
EP-2	1002+06,32	84'	Left	LED25	RAMP 1
EP-3	1003+20,16	14'	Right	LED25	RAMP 1
EP-4	1004+21,77	98'	Left	LED25	RAMP 1
EP-8	1010+25,69	15'	Right	LED25	RAMP 1
EP-9	5015+49,08	42'	Right	LED25	N-109
EP-13	2007+85,47	17'	Right	LED25	RAMP 2
EP-15	3009+91,29	16'	Right	LED25	RAMP 3
EP-18	3002+52,49	15'	Right	LED25	EP-18
EP-19	2999+91,78	18'	Right	LED25	RAMP 3
EP-20	535+18,76	50'	Left	LED25	NOT SHOWN/HWY. US-77
EP-21	5026+78,89	37'	Left	LED25	NOT SHOWN/HWY. N-109
EP-22	5011+87,43	46'	Left	LED25	NOT SHOWN/HWY. N-109
EP-23	5013+65,83	41'	Right	LED25	NOT SHOWN/HWY. N-109

LED LUMINAIRE REQUIREMENTS

UNIT NO.	LUMINAIRE TYPE	SPECIFICATION AND PERFORMANCE CRITERIA
All	LED25	SEE LED ROADWAY LUMINAIRE SPECIAL PROVISION

Relocate Existing Pull Box Schedule

Existing Location						New Location				
Unit No.	Station	Offset	Side	Type	Remarks	Unit No.	Station	Offset	Side	Remarks
EPB-1	1004+35,46	1'	Right	PB-5	RAMP 1	RPB-1	1004+40,36	14'	Right	RAMP 1

Pull Box Schedule

Unit No.	Station	Offset	Side	Type	Remarks
PULL BOX 1	3008+47,66	19'	Right	PB-6	RAMP 3

SCHEDULE OF WIRING MATERIALS

WIRE & CABLE

THE ELECTRICAL, MECHANICAL AND PHYSICAL PROPERTIES OF THE CONDUCTORS LISTED IN THE FOLLOWING SCHEDULE ESTABLISH THE MINIMUM ACCEPTABLE REQUIREMENTS FOR EACH OF THE LISTED APPLICATIONS. CONDUCTORS WHICH HAVE PROPERTIES THAT EXCEED THESE MINIMUM REQUIREMENTS MAY BE FURNISHED, AT THE CONTRACTORS OPTION, WITH THE ENGINEERS' APPROVAL. NO ADJUSTMENT IN THE CONTRACT PRICE WILL BE ALLOWED.

UNLESS INDICATED OTHERWISE ALL CONDUCTORS SHALL BE SINGLE CONDUCTOR, STRANDED COPPER U.L. LISTED, 600V, WITH SIZE OF CONDUCTOR AND TYPE AND COLOR OF INSULATION AS LISTED BELOW.

ONE PHASE CONDUCTOR MUST, AT THE TIME OF INSTALLATION, BE PERMANENTLY IDENTIFIED AS THE LINE 2 (RED) CONDUCTOR AT EACH END AND AT EVERY POINT WHERE THE CONDUCTOR IS ACCESSIBLE. IDENTIFICATION WILL BE ACCOMPLISHED BY (A) COLORING THE EXPOSED INSULATION RED (B) MARKING THE EXPOSED INSULATION WITH RED TAPE.

SERVICE ENTRANCE:	TYPE USE OR XHHW, NO. 6 AWG
EQUIPMENT GROUND:	BARE OR INSULATED, NO. 6 AWG
POLE:	NO. 12 AWG, THW OR THWN.
BRANCH CIRCUIT FEEDERS, INCLUDING NEUTRALS:	USE OR XHHW (IF PLACED IN CONDUIT) USE OR UF (IF DIRECT BURIED), NO. 6 AWG
COLOR CODES:	"NEUTRAL" - WHITE OR GREY; "INSULATED EQUIPMENT GROUND" - GREEN, "LINE 1" - BLACK, "LINE 2" - RED

N2

Project Number 77-6(1080)

C.N. 13502

LIGHTING

NEBRASKA Good Life. Great Journey.

Roadway Design Division

Modeling Notes:
- Details can be placed in an OpenRoads Designer sheet model and added to the project's sheet index where it will be synchronized to Bentley Infrastructure Cloud

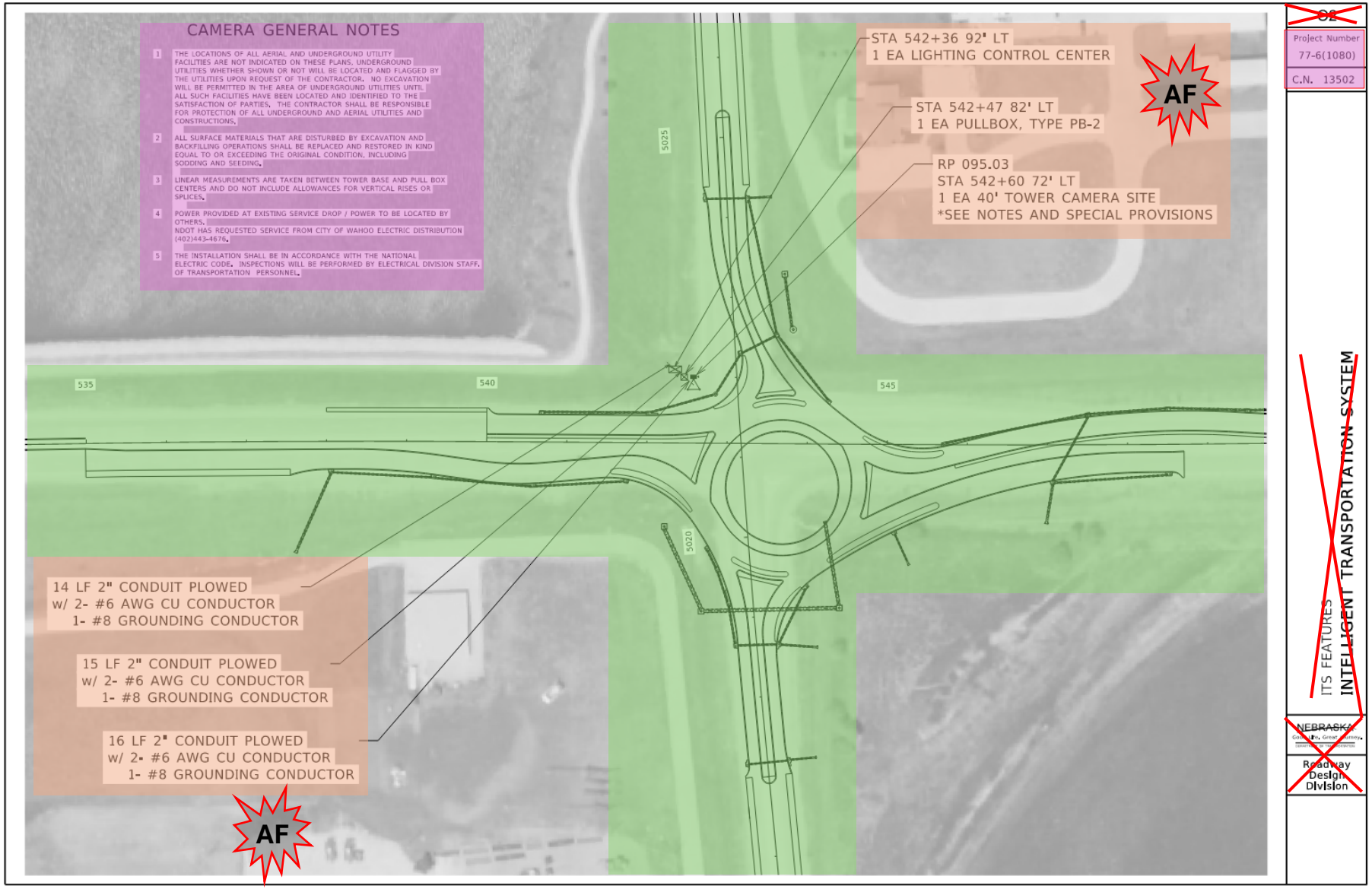
ITS Features

Project Information Document
- Material requirements
- Project identification
- Department information

Information Derived from Model Viewer
- ITS element location

Model Element Attributes
- ITS element property data

Information not Included
- Sheet title
- Sheet number



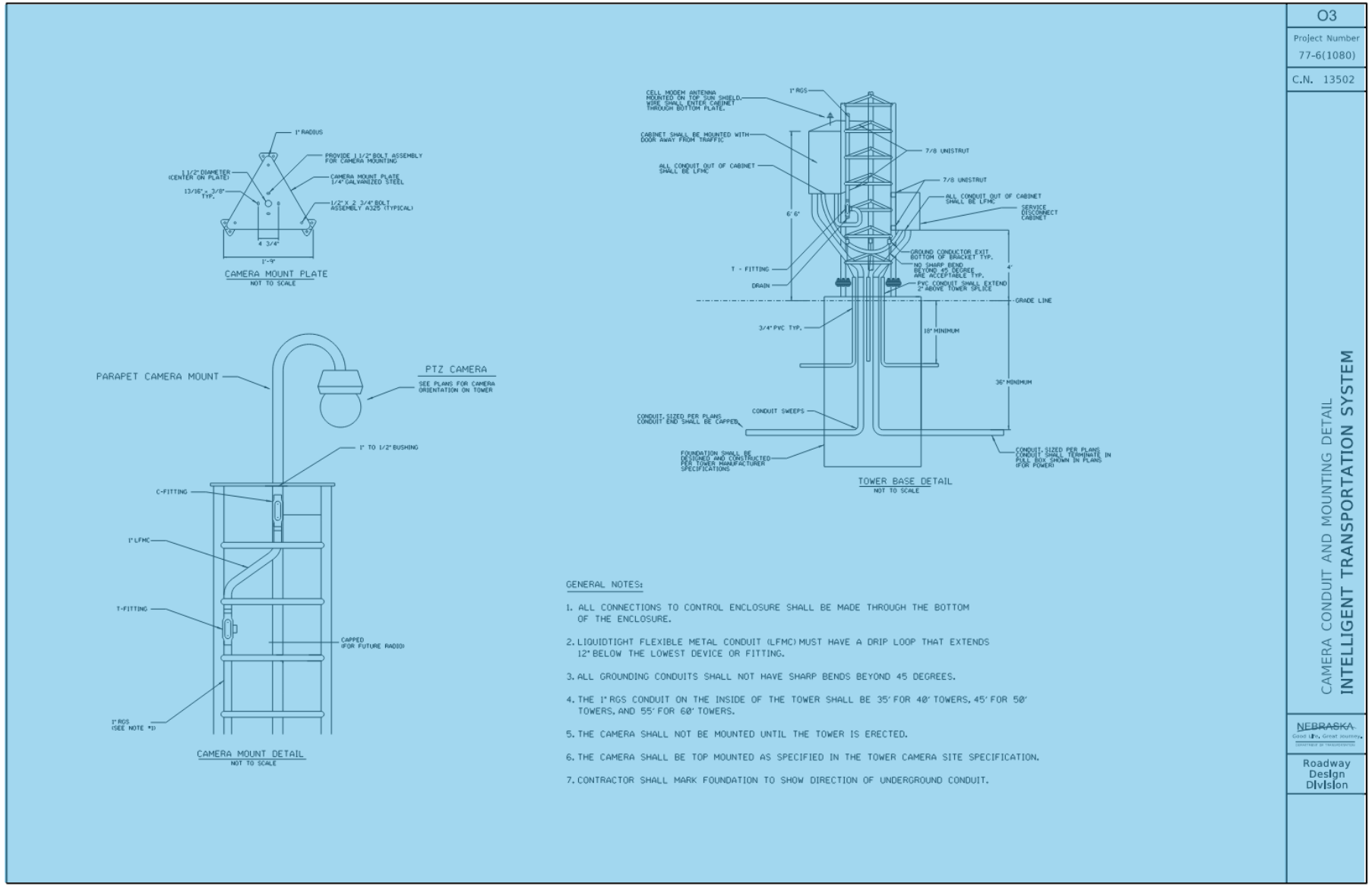
Alternate Data Format
- This data has been exported and presented in Excel. The comps are included in the project documents.

Modeling Notes:
- ITS elements and conduits are drawn in 2D

ITS Camera Details

2D Data in Sheet Index

- Design details and notes
- Schedules
- Sheet name
- Sheet Number
- Project identification
- Department Information



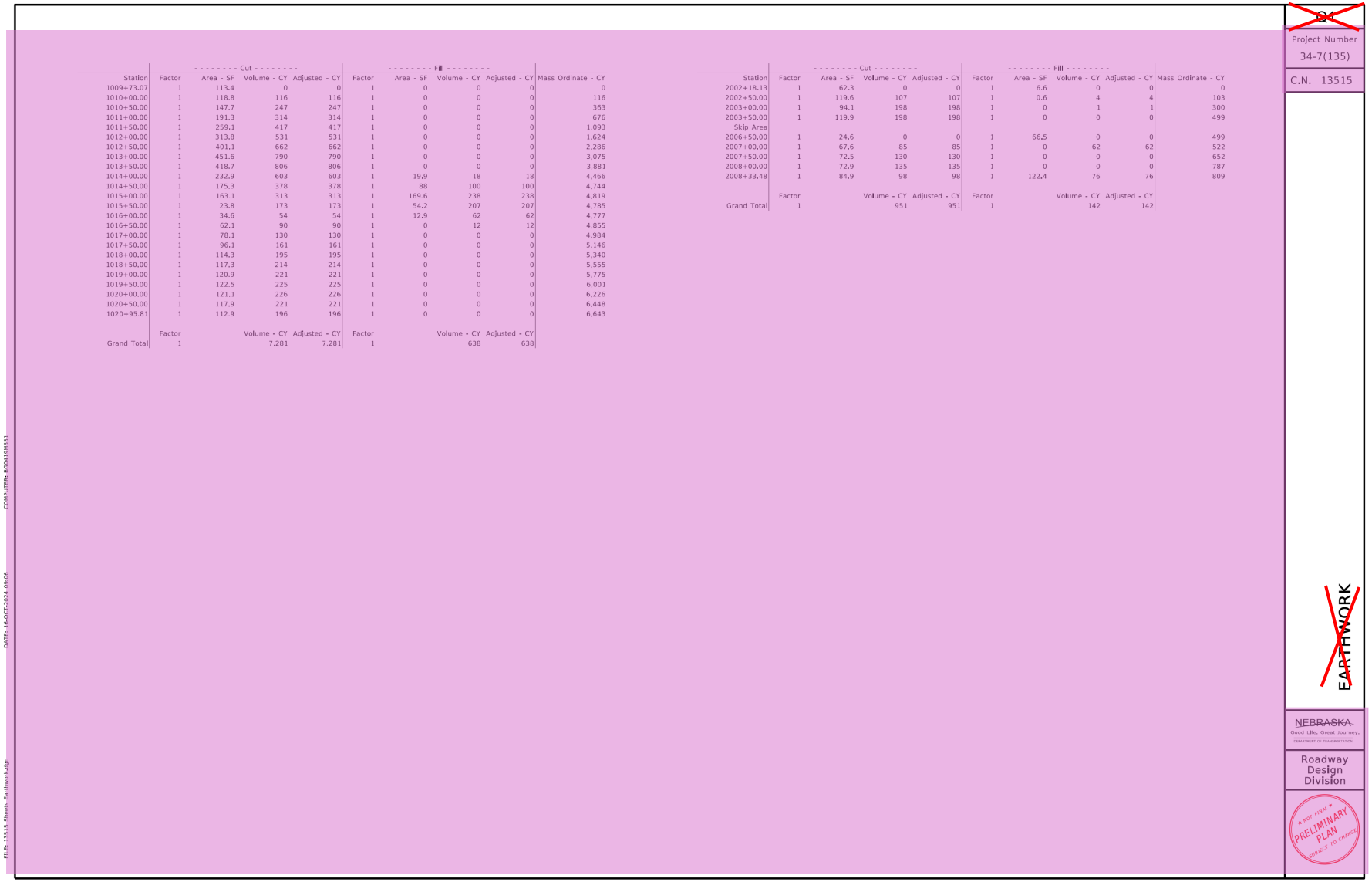
Modeling Notes:

- Details can be placed in an OpenRoads Designer sheet model and added to the project's sheet index where it will be synchronized to Bentley Infrastructure Cloud

Earthwork Data

Project Information Document

- Material requirements
- Project identification
- Department information



Station	Cut - Factor	Cut - Area - SF	Cut - Volume - CY	Cut - Adjusted - CY	Fill - Factor	Fill - Area - SF	Fill - Volume - CY	Fill - Adjusted - CY	Mass Ordinate - CY
1009+73.07	1	113.4	0	0	1	0	0	0	0
1010+00.00	1	118.8	116	116	1	0	0	0	116
1010+50.00	1	147.7	247	247	1	0	0	0	363
1011+00.00	1	191.3	314	314	1	0	0	0	676
1011+50.00	1	259.1	417	417	1	0	0	0	1,093
1012+00.00	1	313.8	531	531	1	0	0	0	1,624
1012+50.00	1	401.1	662	662	1	0	0	0	2,286
1013+00.00	1	451.6	790	790	1	0	0	0	3,075
1013+50.00	1	418.7	806	806	1	0	0	0	3,881
1014+00.00	1	232.9	603	603	1	19.9	18	18	4,466
1014+50.00	1	175.3	378	378	1	88	100	100	4,744
1015+00.00	1	163.1	313	313	1	169.6	238	238	4,819
1015+50.00	1	23.8	173	173	1	54.2	207	207	4,785
1016+00.00	1	34.6	54	54	1	12.9	62	62	4,777
1016+50.00	1	62.1	90	90	1	0	12	12	4,855
1017+00.00	1	78.1	130	130	1	0	0	0	4,984
1017+50.00	1	96.1	161	161	1	0	0	0	5,146
1018+00.00	1	114.3	195	195	1	0	0	0	5,340
1018+50.00	1	117.3	214	214	1	0	0	0	5,555
1019+00.00	1	120.9	221	221	1	0	0	0	5,775
1019+50.00	1	122.5	225	225	1	0	0	0	6,001
1020+00.00	1	121.1	226	226	1	0	0	0	6,226
1020+50.00	1	117.9	221	221	1	0	0	0	6,448
1020+95.81	1	112.9	196	196	1	0	0	0	6,643
Grand Total	1		7,281	7,281	1		638	638	

Station	Cut - Factor	Cut - Area - SF	Cut - Volume - CY	Cut - Adjusted - CY	Fill - Factor	Fill - Area - SF	Fill - Volume - CY	Fill - Adjusted - CY	Mass Ordinate - CY
2002+18.13	1	62.3	0	0	1	6.6	0	0	0
2002+50.00	1	119.6	107	107	1	0.6	4	4	103
2003+00.00	1	94.1	198	198	1	0	1	1	300
2003+50.00	1	119.9	198	198	1	0	0	0	499
Skip Area									
2006+50.00	1	24.6	0	0	1	66.5	0	0	499
2007+00.00	1	67.6	85	85	1	0	62	62	522
2007+50.00	1	72.5	130	130	1	0	0	0	652
2008+00.00	1	72.9	135	135	1	0	0	0	787
2008+33.48	1	84.9	98	98	1	122.4	76	76	809
Grand Total	1		951	951	1		142	142	

Project Number
34-7(135)

C.N. 13515

EARTHWORK

NEBRASKA
Good Life. Great Journey.
DEPARTMENT OF TRANSPORTATION

Roadway Design Division

NOT FINAL
PRELIMINARY PLAN
SUBJECT TO CHANGE

COMPUTER: RG041MSS1
DATE: 16-OCT-2024 - 0906
FILE: 13515 Sheets Earthwork.dgn

Modeling Notes:

- Earthwork data is derived using section boundaries in ORD. The section boundary measures the volumetric meshes only within the range of that individual boundary. The reports for earthwork are presented in excel format and are placed with the comps.

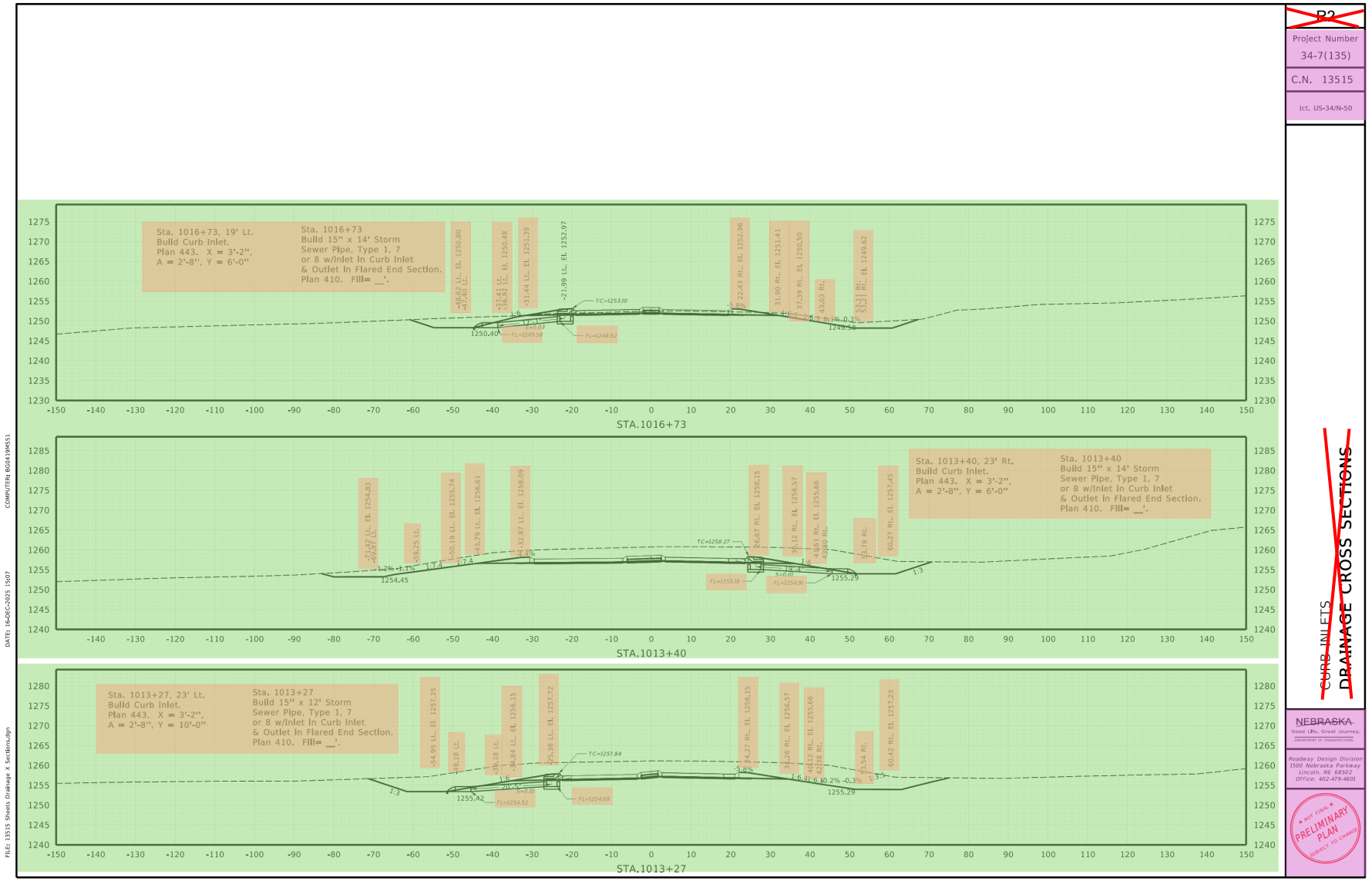
Drainage Cross Sections

Information Derived from Model Viewer
- Drainage section graphics and information

Model Element Attributes
- Drainage Build data
- Drainage Structure annotations
- Cross Section annotations

Project Information Document
- Project identification
- Department information

Information not Included
- Sheet number
- Sheet name
- Scale bar



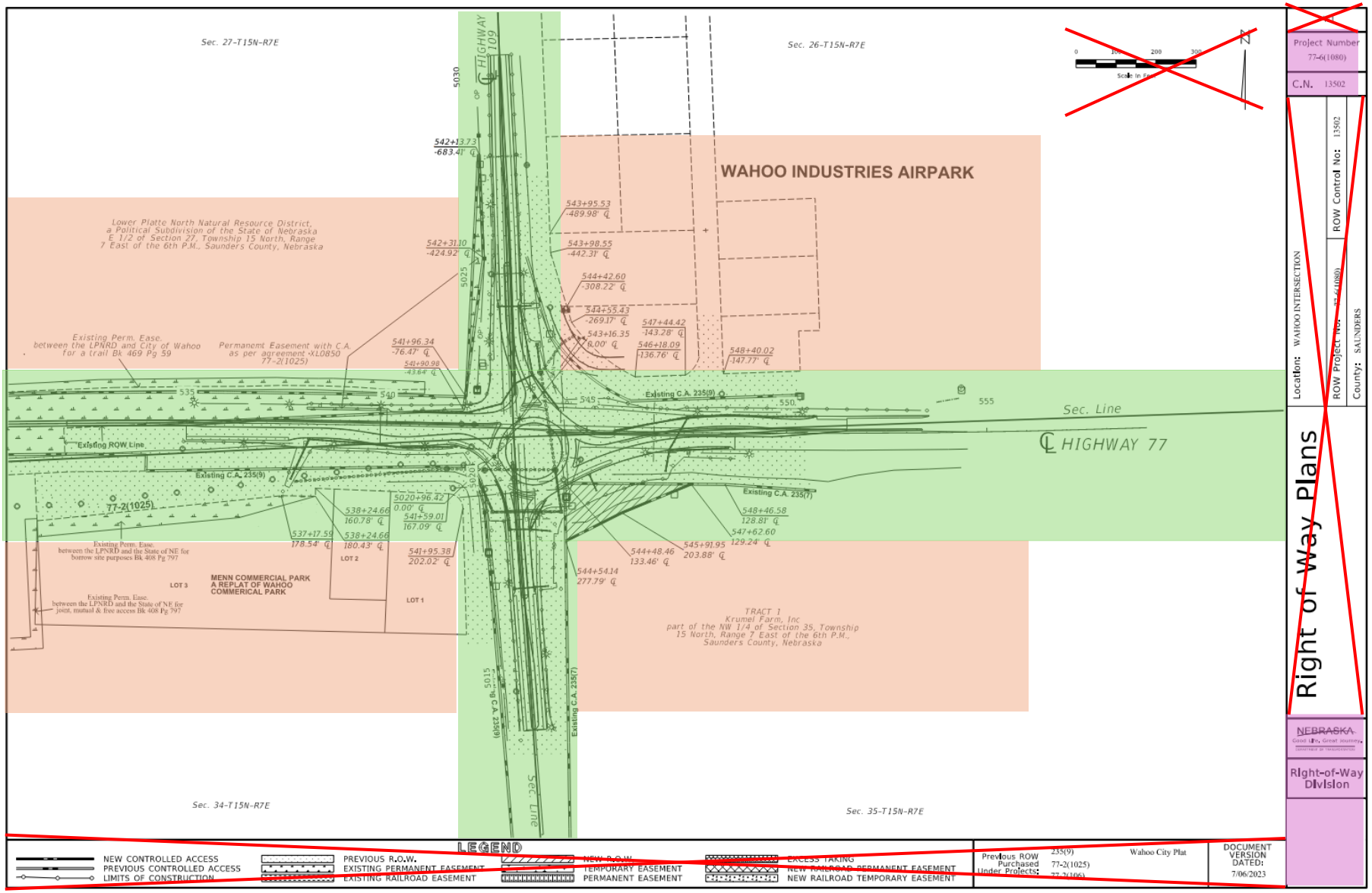
Modeling Notes:
- Saved Views for each drainage cross section have been created in Bentley Infrastructure Cloud.
- Cross Section annotations display only when using corridor analysis tools.

Right of Way Plans

Information Derived from Model Viewer
- Right-of-Way Lines and shape elements

Model Element Attributes
- Tract and Ownership information

Information not Included
- Sheet title
- Sheet number
- Legend
- As-built Right-of-Way information
- North Arrow
- Scale bar



Modeling Notes:
- Although the model was delivered as part of this project, traditional Right-of-Way plans were produced for negotiation and legal purposes.

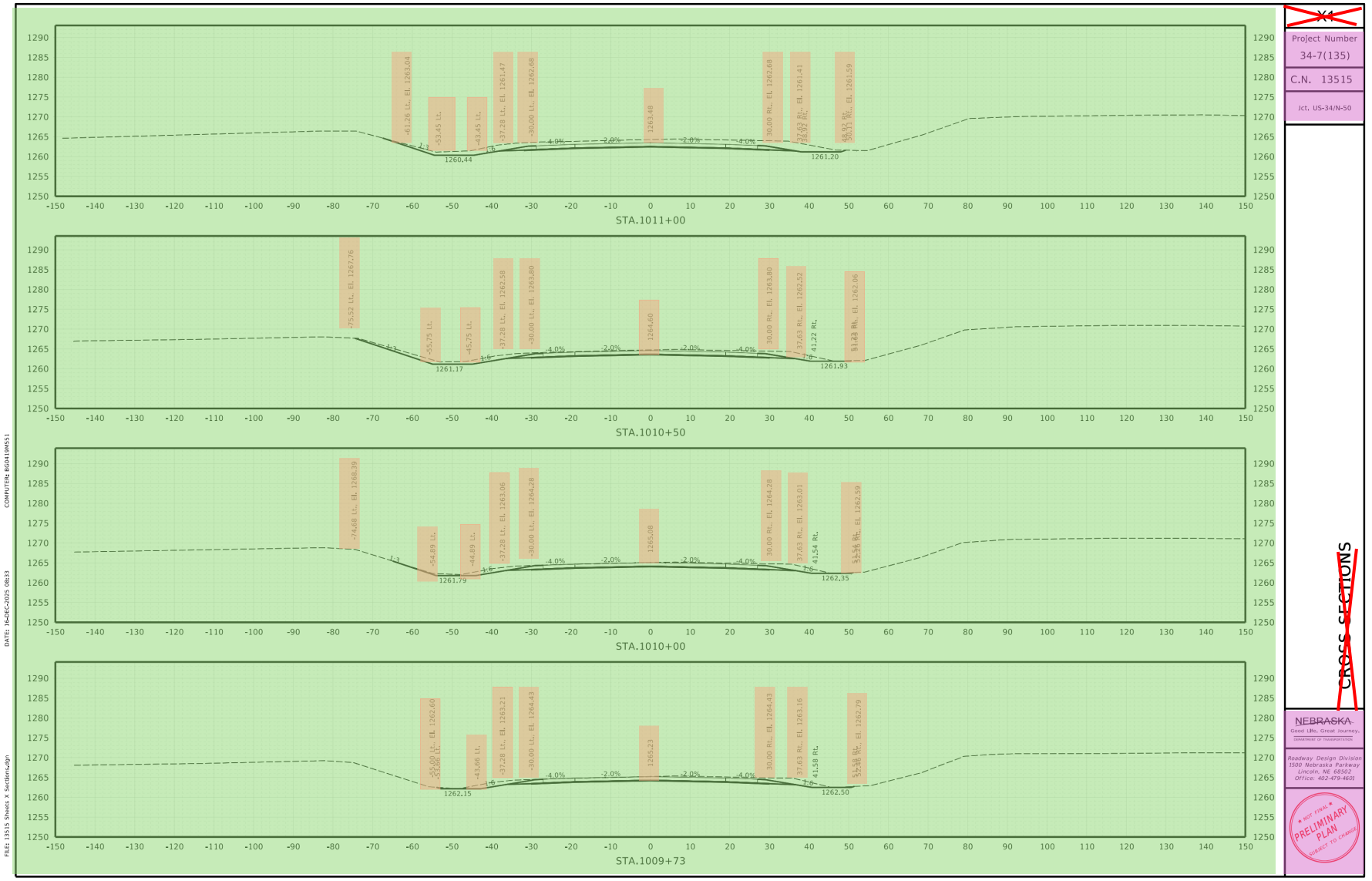
Cross Sections

Project Information Document
- Project identification
- Department information

Information Derived from Model Viewer
- Cross section graphics and data

Model Element Attributes
- Cross section annotations

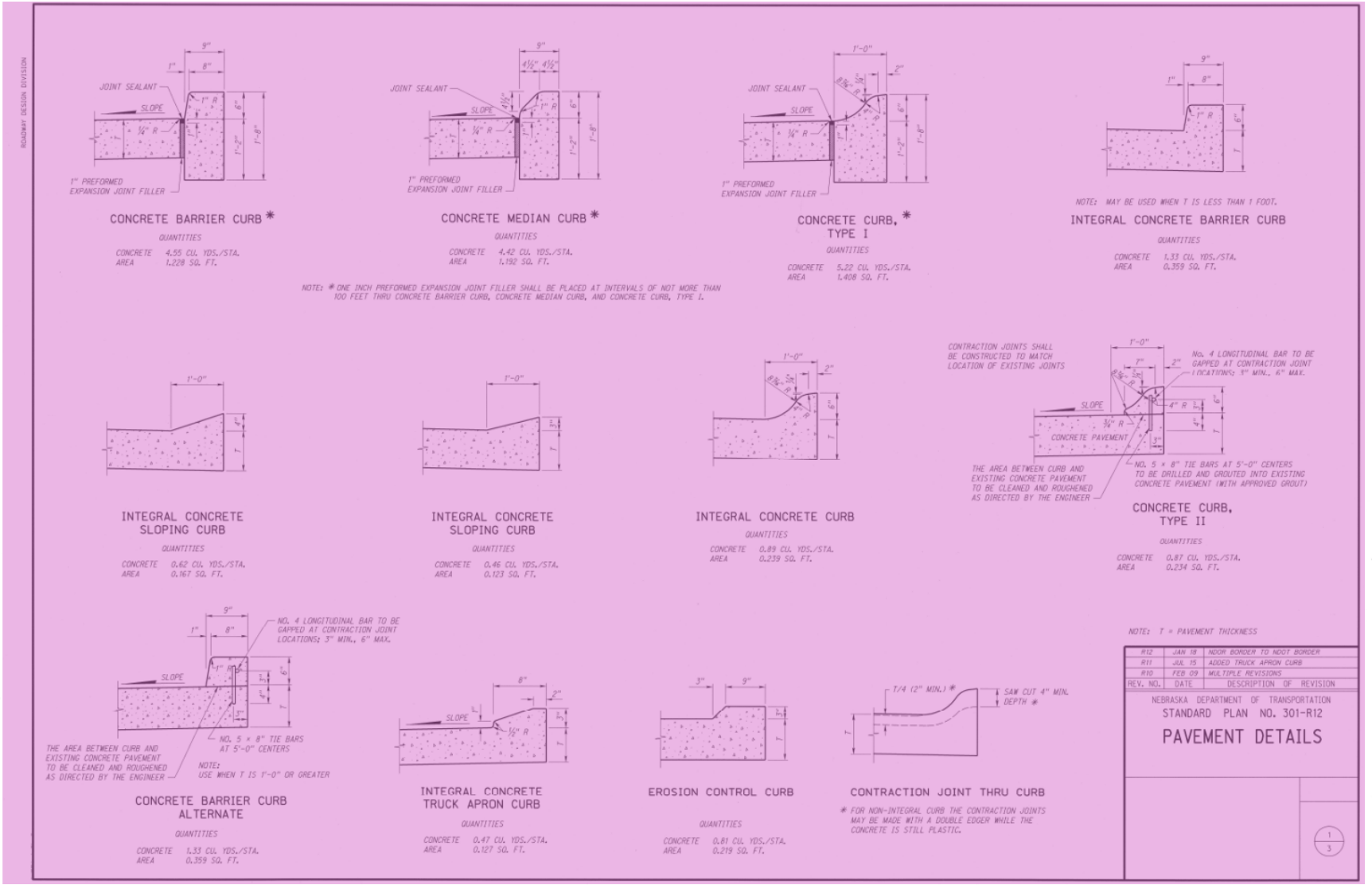
Information not Included
- Sheet title
- Sheet number



Modeling Notes:
- Cross Section annotations display only when using corridor analysis tools.

Standard Plans

Project Information Document
- Project identification
- Department information



Modeling Notes:
- All Standard Plan sheets are in a single pdf document in the project files. The sheets are unchanged.