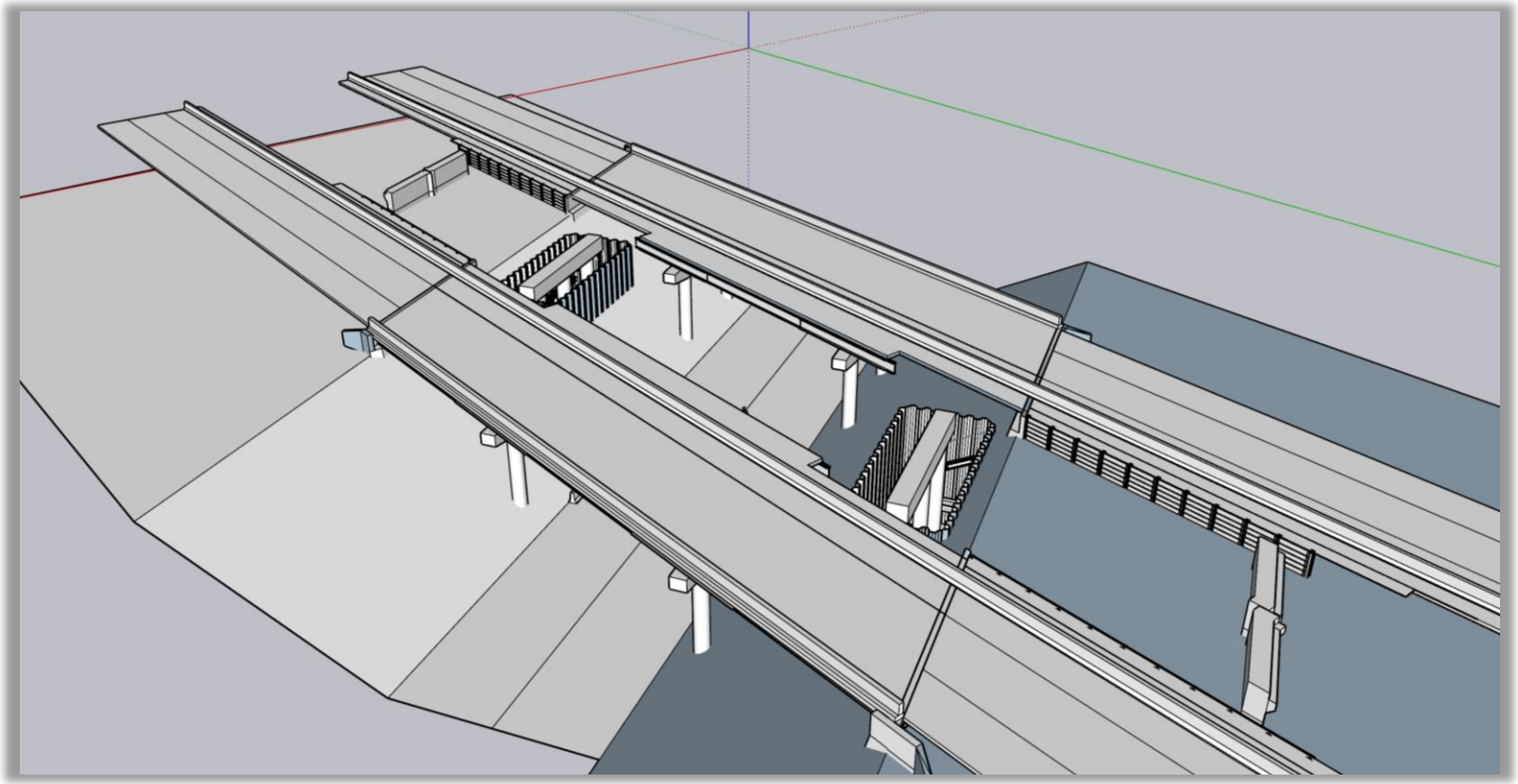
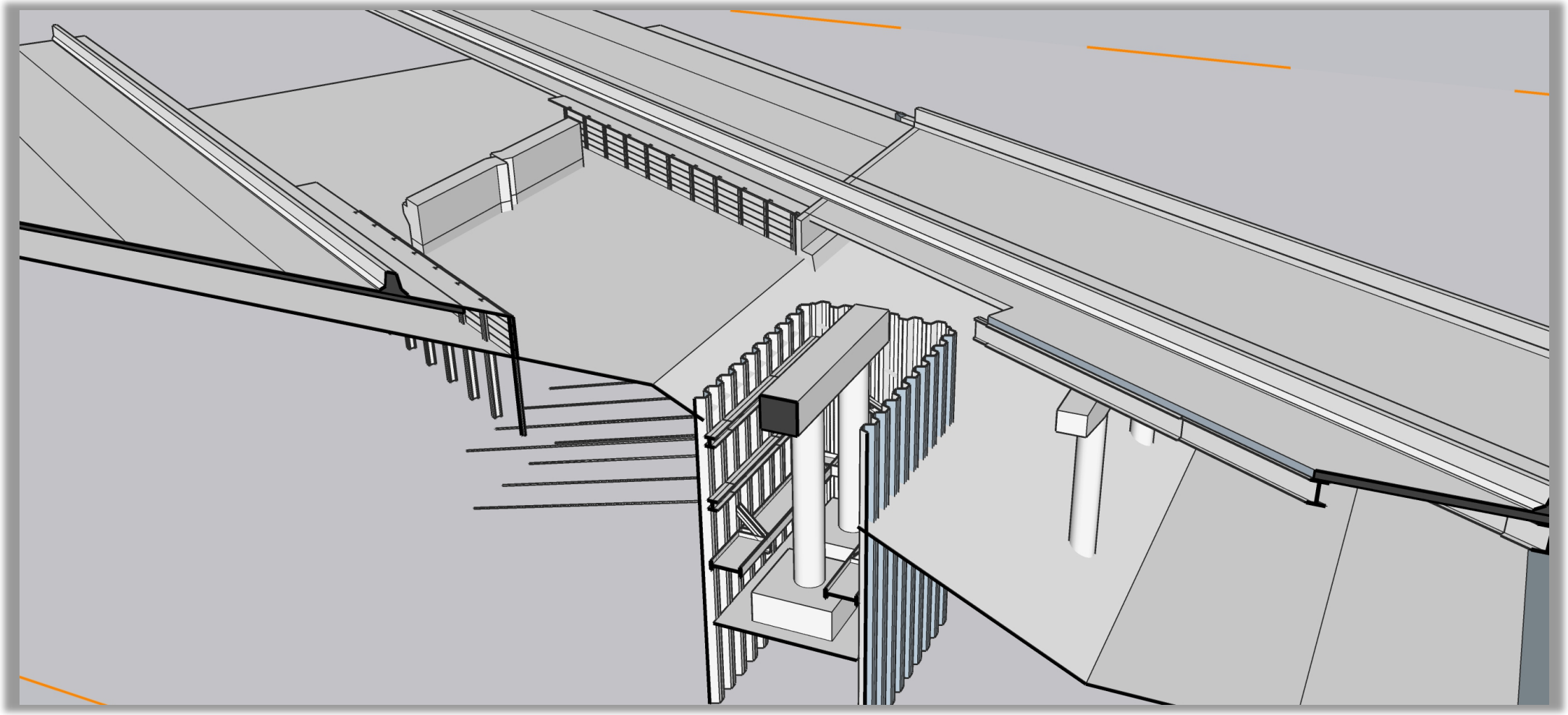
Value of a Model for a Contractor



Brian Jacob
Cramer and Associates, Inc.
bjacob@cramerbridges.com

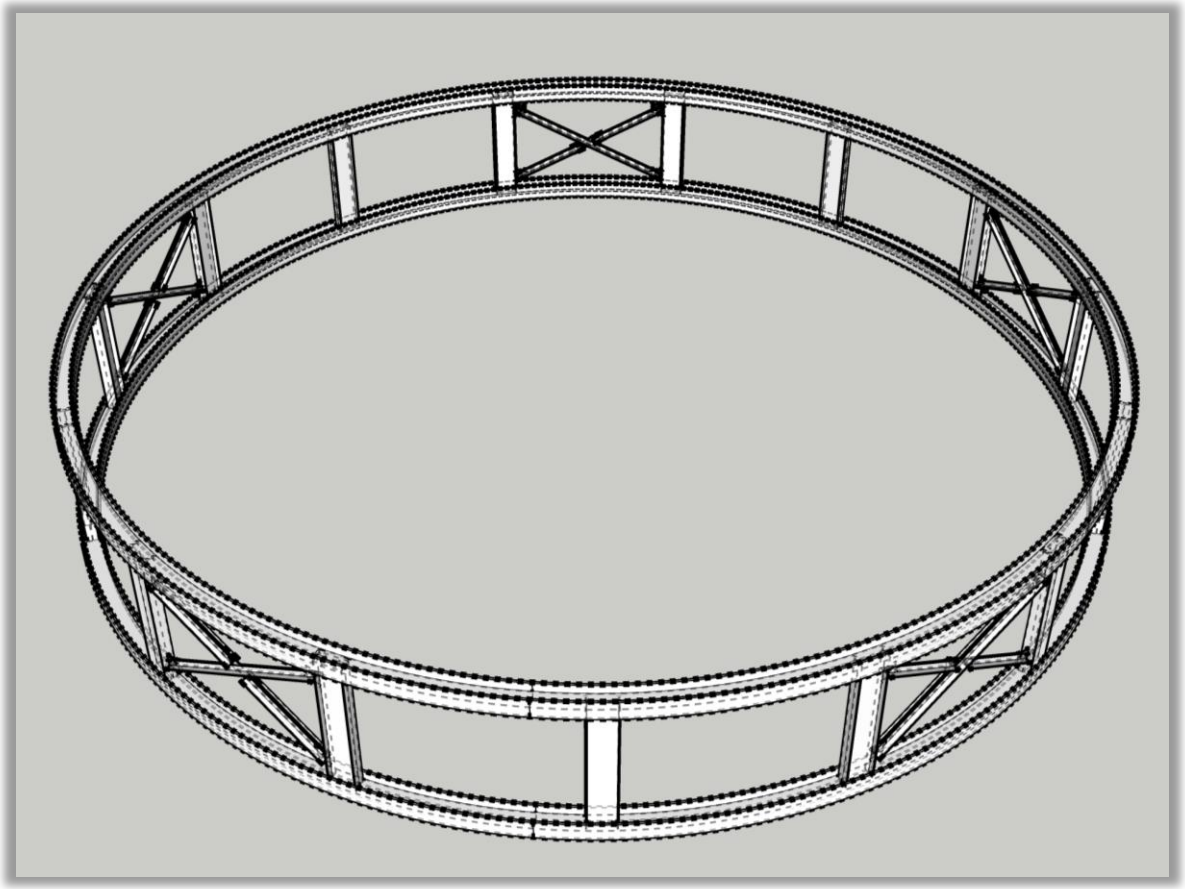
CRAMER & ASSOCIATES INC.

Value of a 3D Model and Digital Delivery



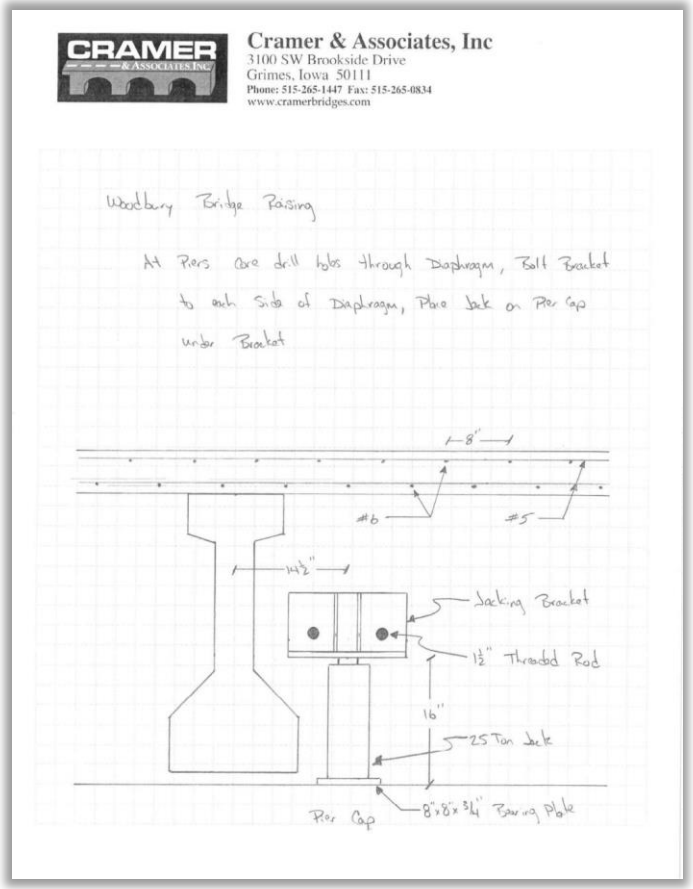
CRAMER & ASSOCIATES INC.

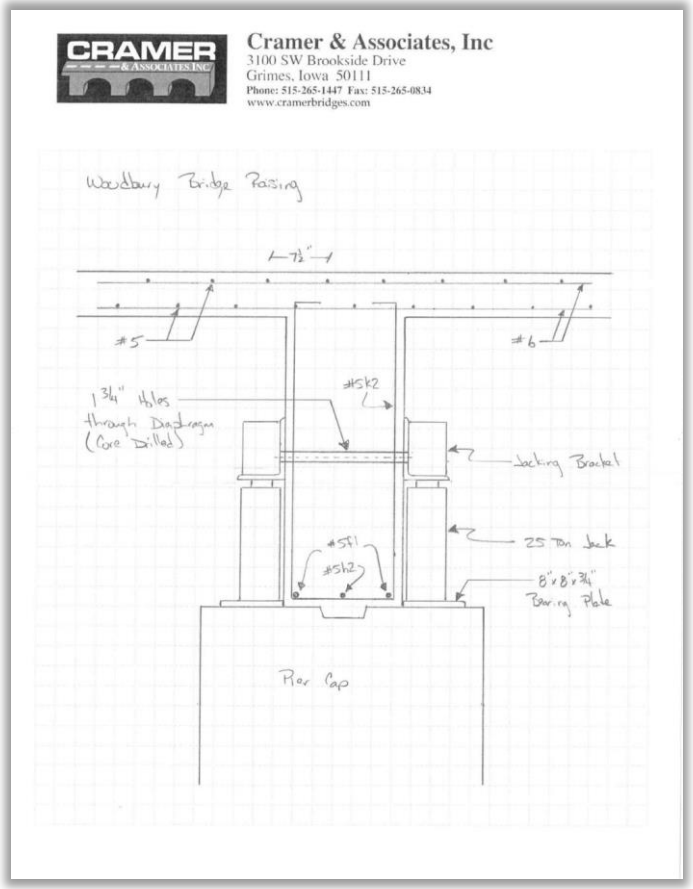
Value of a 3D Model



Why a 3D Model/Why SketchUp?

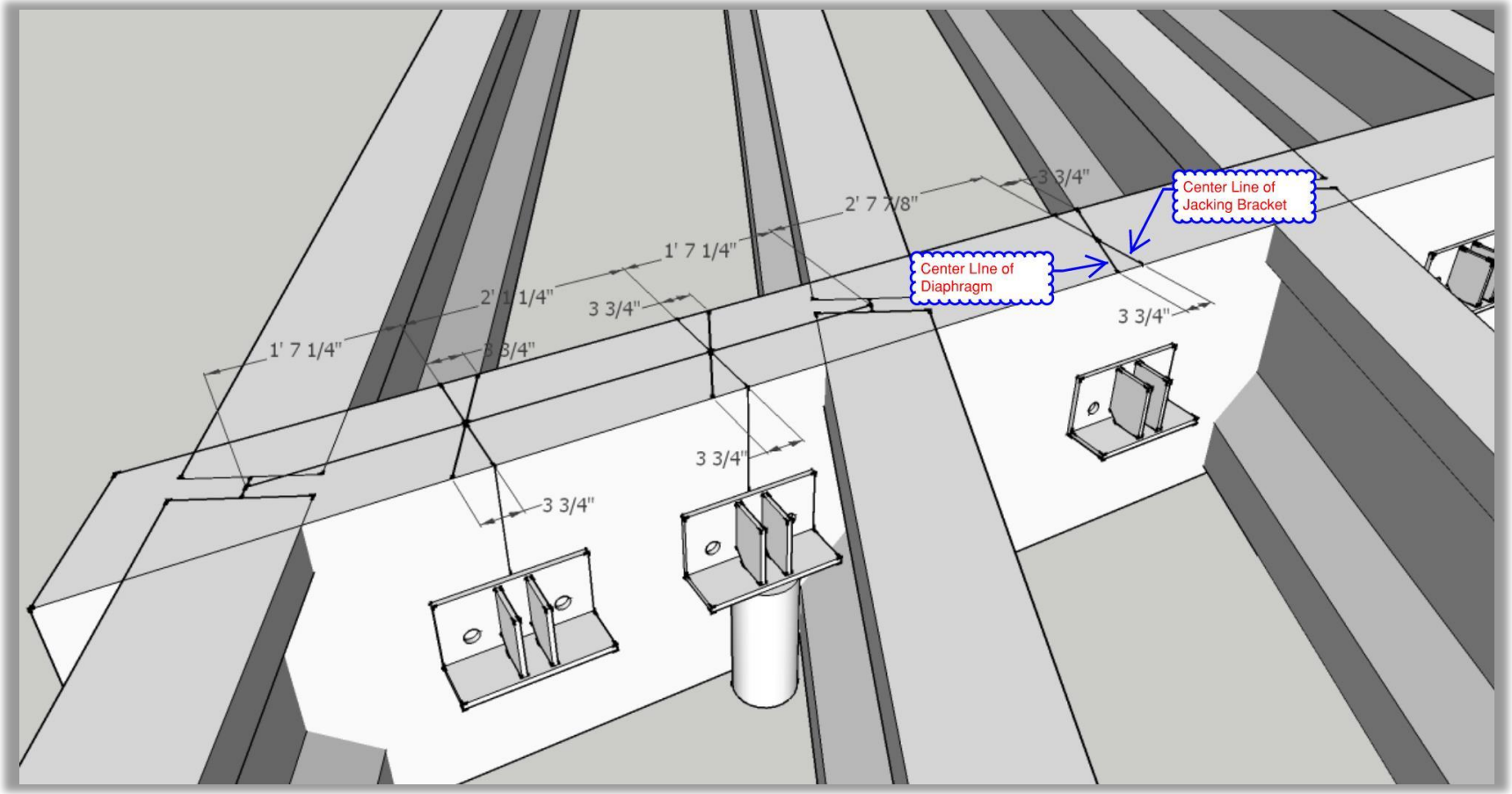
- Easier way to draw
- Saves time
- CAD software not an option





Other Benefits

- Better designs
- Helps communicate ideas to:
  - Owner
  - Engineer
  - People building it
  - Inspector

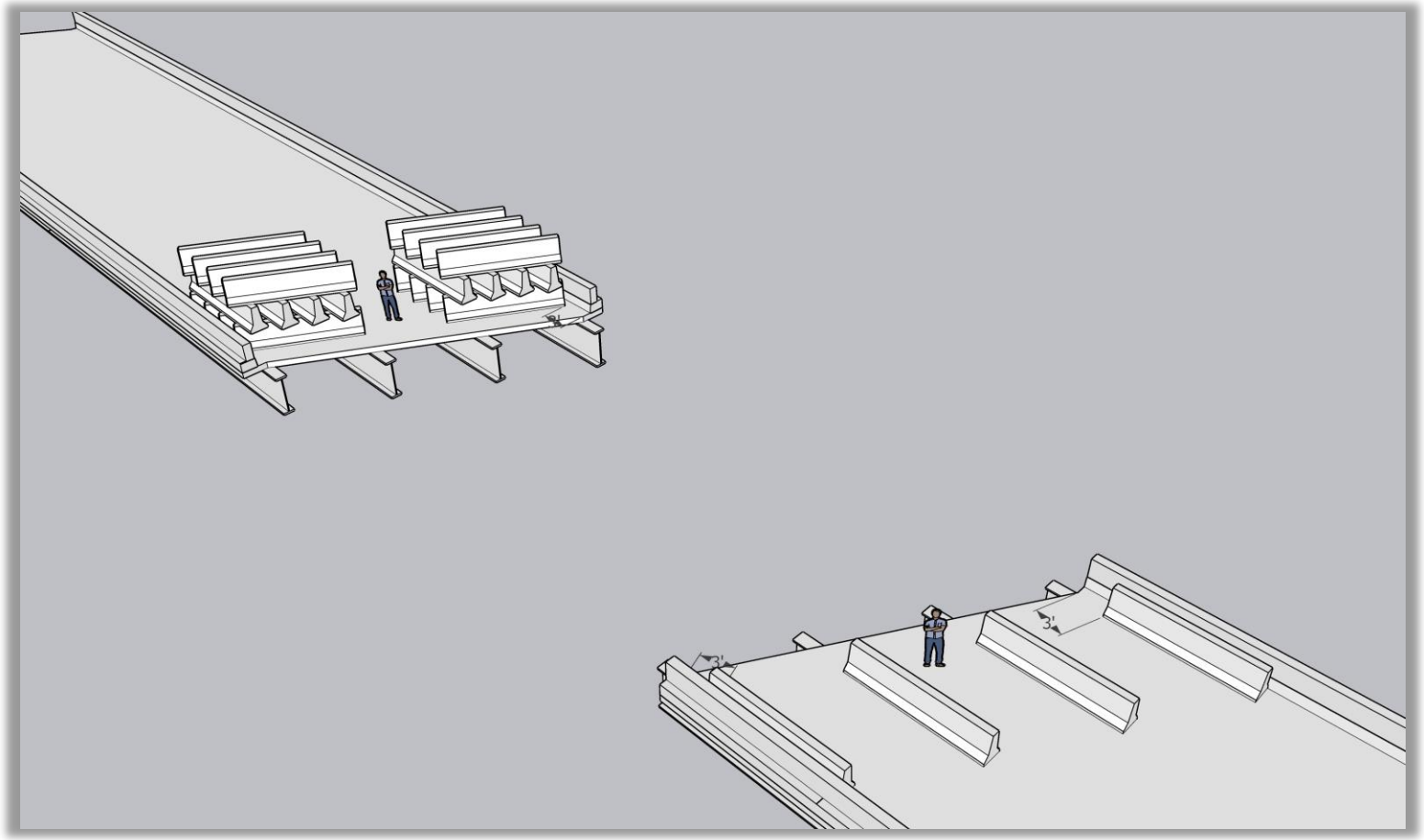


Woodbury Bridge Replacement

CRAMER & ASSOCIATES INC.

Keep It Simple

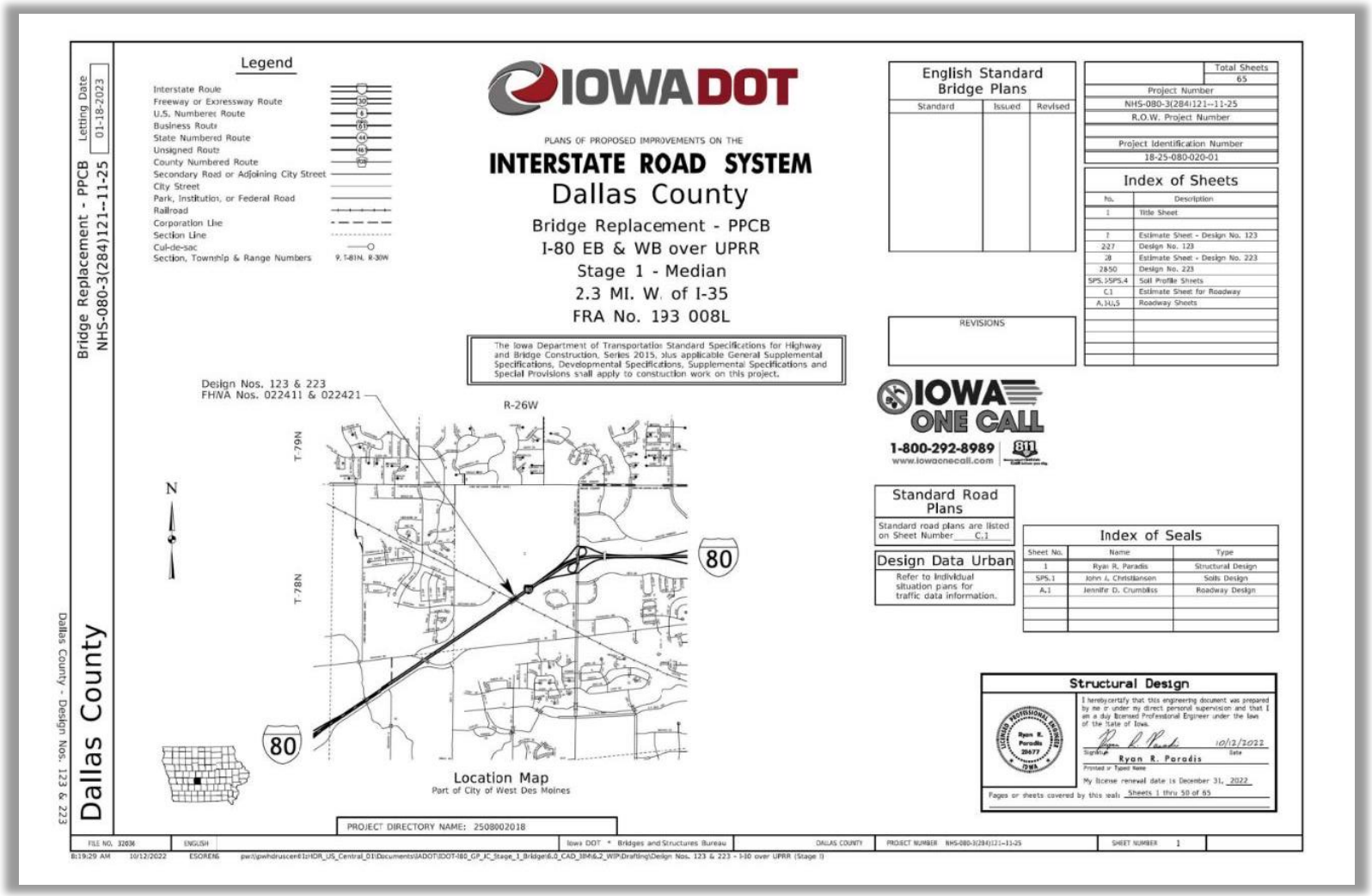
- Only draw what is needed
- Uses simple shapes
- Small file size



Freemont Bridge Replacement

CRAMER & Associates Inc.

Dallas County Median Bridge



Bridge Replacement - PPCB
NHS-080-3(284)121--11-25

Letting Date 01-18-2023

Dallas County

Dallas County - Design Nos. 123 & 223

Legend

Interstate Route
Freeway or Expressway Route
U.S. Numbered Route
Business Route
State Numbered Route
Unsigned Route
County Numbered Route
Secondary Road or Adjoining City Street
City Street
Park, Institution, or Federal Road
Railroad
Corporation Line
Section Line
Cul-de-sac
Section, Township & Range Numbers — 9, T-81N, R-30W

IOWA DOT

PLANS OF PROPOSED IMPROVEMENTS ON THE

INTERSTATE ROAD SYSTEM

Dallas County

Bridge Replacement - PPCB
I-80 EB & WB over UPRR
Stage 1 - Median
2.3 MI. W. of I-35
FRA No. 193 008L

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, Series 2015, plus applicable General Supplemental Specifications, Developmental Specifications, Supplemental Specifications and Special Provisions shall apply to construction work on this project.

Design Nos. 123 & 223
FHWA Nos. 022411 & 022421

R-26W
T-79N
T-78N
N
80
80

Location Map
Part of City of West Des Moines

PROJECT DIRECTORY NAME: 2508002018

English Standard Bridge Plans		
Standard	Issued	Revised

REVISIONS

	Total Sheets
	65
Project Number	
NHS-080-3(284)121--11-25	
R.O.W. Project Number	
Project Identification Number	
18-25-080-020-01	

Index of Sheets

No.	Description
1	Title Sheet
7	Estimate Sheet - Design No. 123
227	Design No. 123
28	Estimate Sheet - Design No. 223
2850	Design No. 223
SPS.1-SPS.4	Soil Profile Sheets
C.1	Estimate Sheet for Roadway
A.1-A.5	Roadway Sheets

IOWA ONE CALL
1-800-292-8989
www.iowaonecall.com
811

Standard Road Plans
Standard road plans are listed on Sheet Number C.1

Design Data Urban
Refer to individual situation plans for traffic data information.

Index of Seals

Sheet No.	Name	Type
1	Ryan R. Paradis	Structural Design
SPS.1	John A. Christiansen	Soils Design
A.1	Jennifer D. Crumbliss	Roadway Design

Structural Design

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Signature: Ryan R. Paradis — Date: 10/12/2022
Printed or Typed Name: Ryan R. Paradis
My license renewal date is December 31, 2022
Pages or sheets covered by this seal: Sheets 1 thru 50 of 65

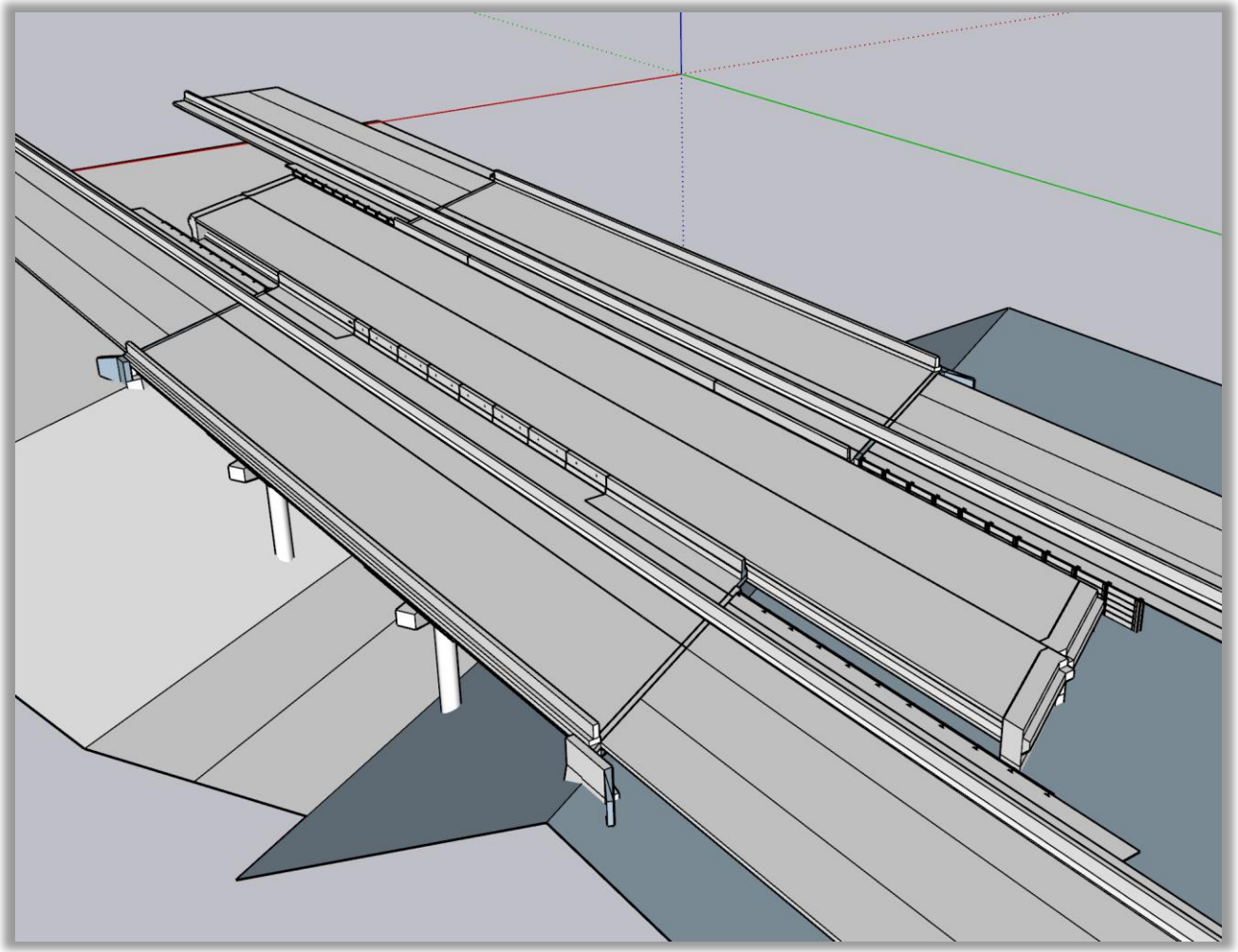
FILE NO. 3263K | ENGLISH | Iowa DOT * Bridges and Structures Bureau | DALLAS COUNTY | PROJECT NUMBER NHS-080-3(284)121--11-25 | SHEET NUMBER 1
8:19:29 AM 10/12/2022 ESORENS pw:\\pwhdruscen61:rtDR_US_Central_01\Documents\IADOT\IDOT-I80_GP_IC_Stage_1_Bridge\6.0_CAD_3D\6.2_WIP\Drafting\Design Nos. 123 & 223 - I-80 over UPRR (Stage 1)

CRAMER & ASSOCIATES INC.

Dallas County Median Bridge

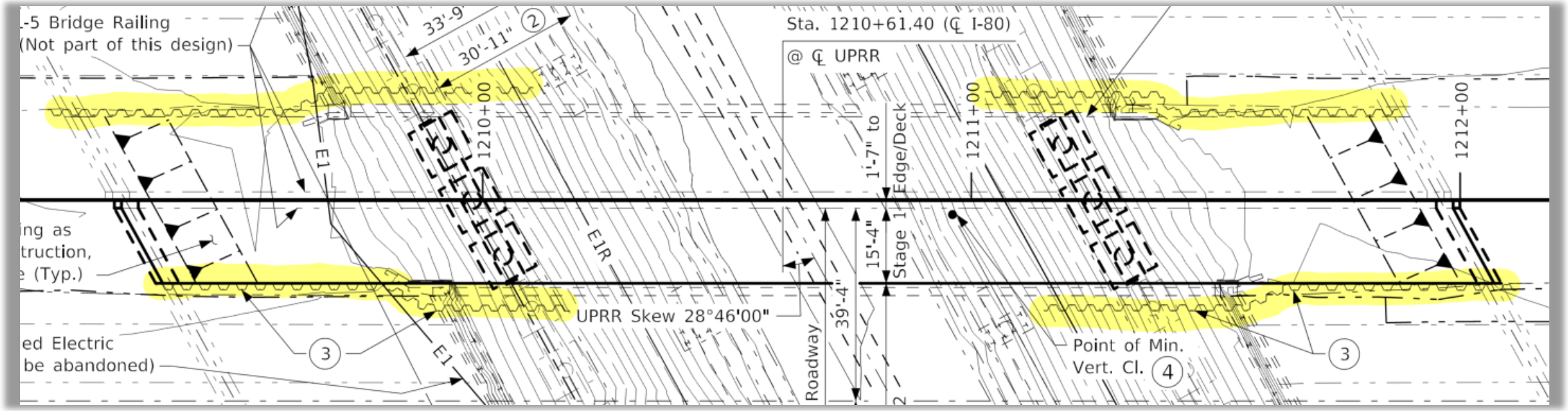
CRAMER & ASSOCIATES INC.

Dallas County Median Bridge



CRAMER & Associates Inc.

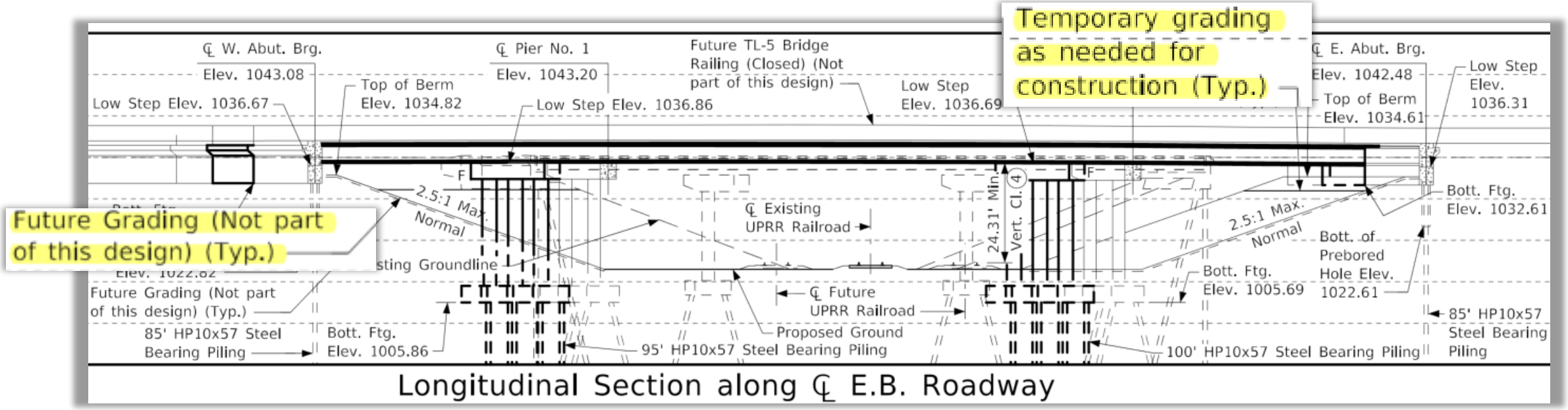
Dallas County Median Bridge



3 Shoring as needed for construction. To be removed by Stage 2 Contractor. See Design Sheet 4 for additional shoring notes. See Design Sheet 8 for additional removal/shoring notes.

CRAMER & ASSOCIATES INC.

Dallas County Median Bridge

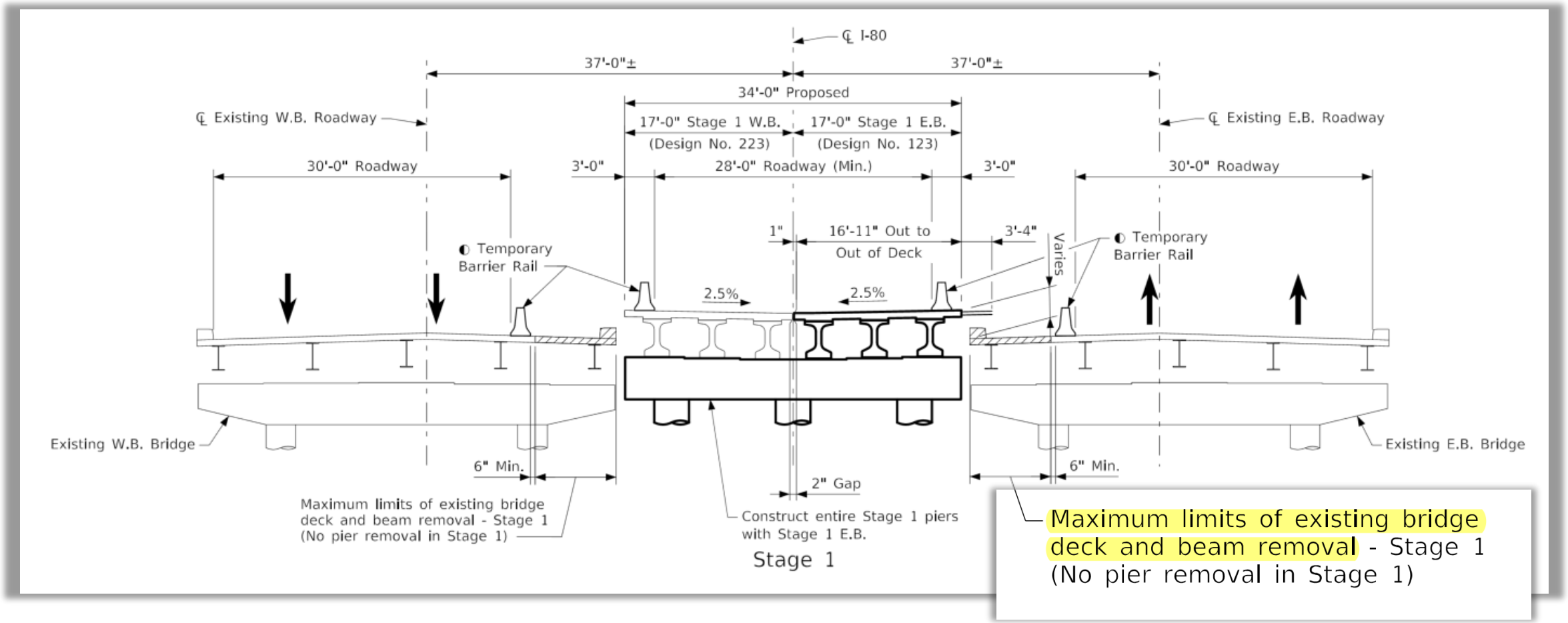


Shoring to remain in place and removed by others in a future contract, and shall be paid for as a lump sum including all cost for designing, furnishing and installing. Shoring shall satisfy the requirements of Materials I.M. 107 and Articles 1107.06, B and 1107.07, of the Standard Specifications. A copy of the as-built shoring plans shall be submitted to the RCE.

The shoring layout and temporary grading line shown on the Situation Plan is conceptual. The actual temporary grading line is determined by the Contractor and dependent on the shoring design. The shoring and temporary grading is necessary to establish the top of berm elevation and to install the proposed bridge abutments, piers and beams. The area under the proposed bridge shall be excavated only as necessary for the installation of these elements, in order to minimize the depth of shoring. Final grading will be done in a future contract. All excavation and backfill required for installation of shoring shall be included in the unit price bid for "Shoring".

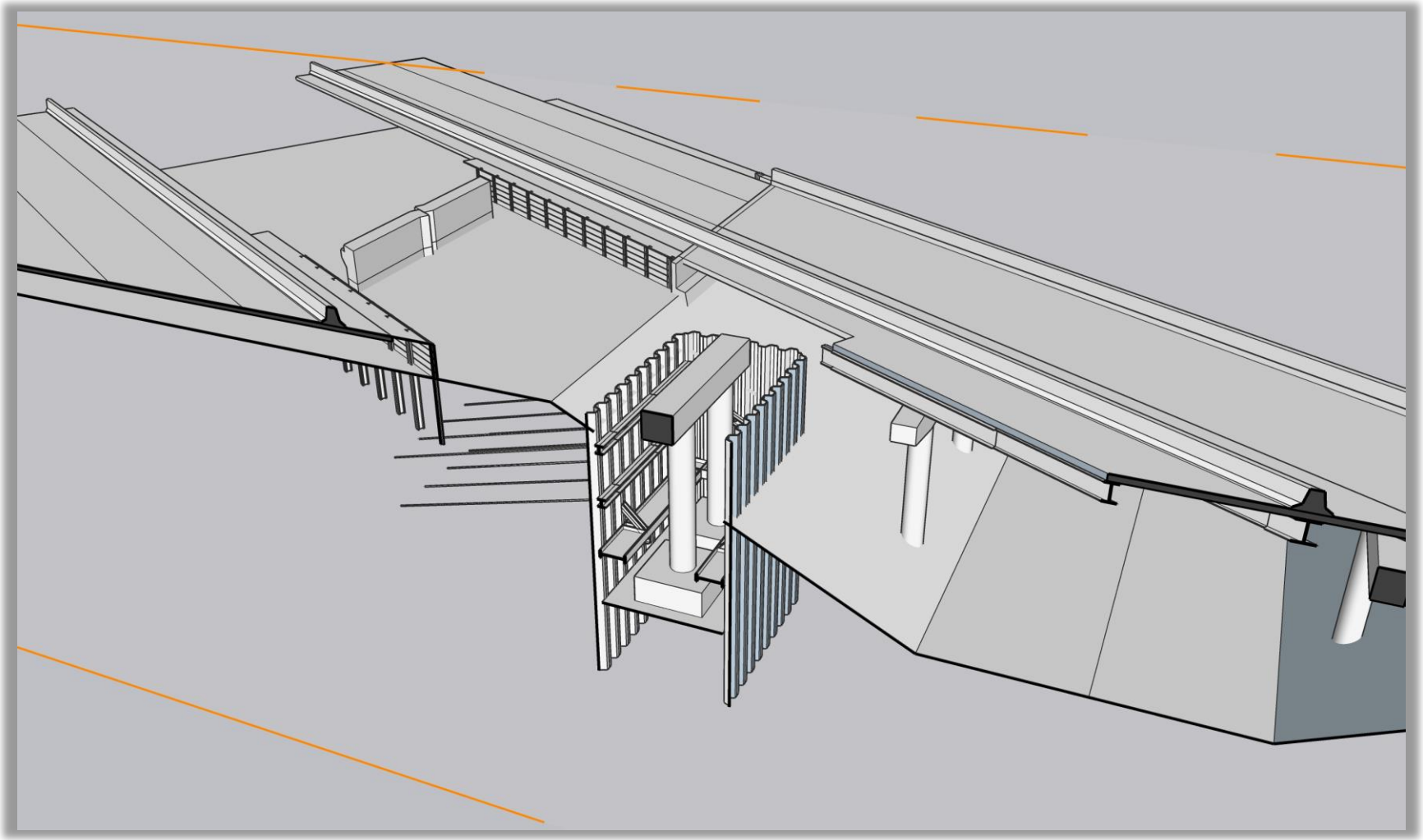
CRAMER & Associates Inc.

Dallas County Median Bridge



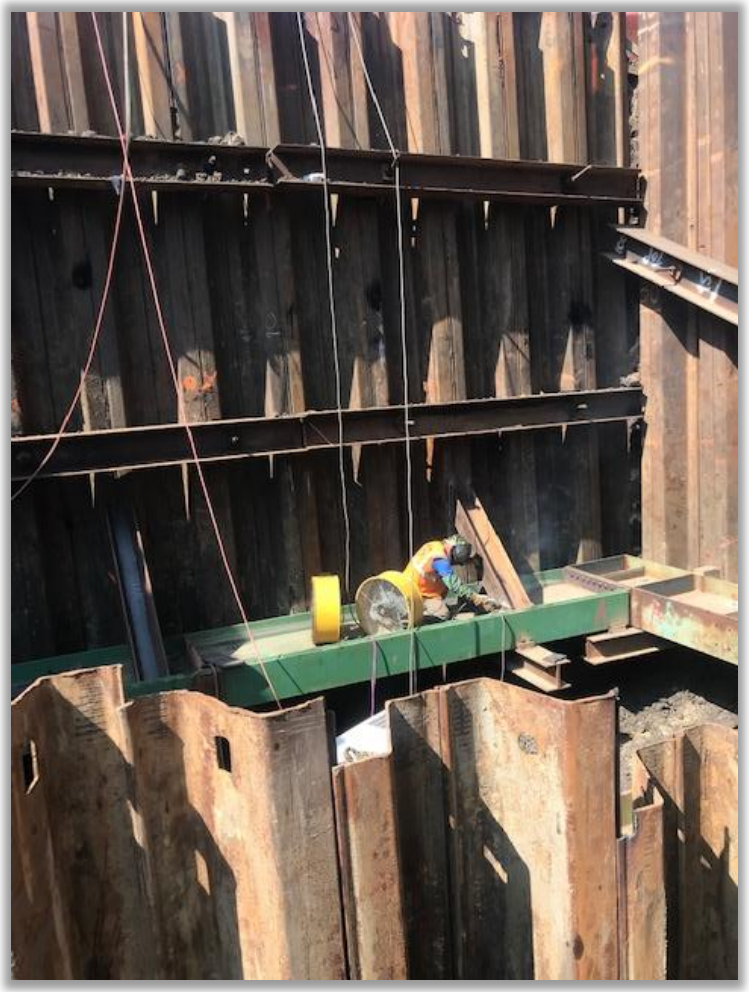
Maximum limits of existing bridge deck and beam removal - Stage 1
(No pier removal in Stage 1)

Dallas County Median Bridge



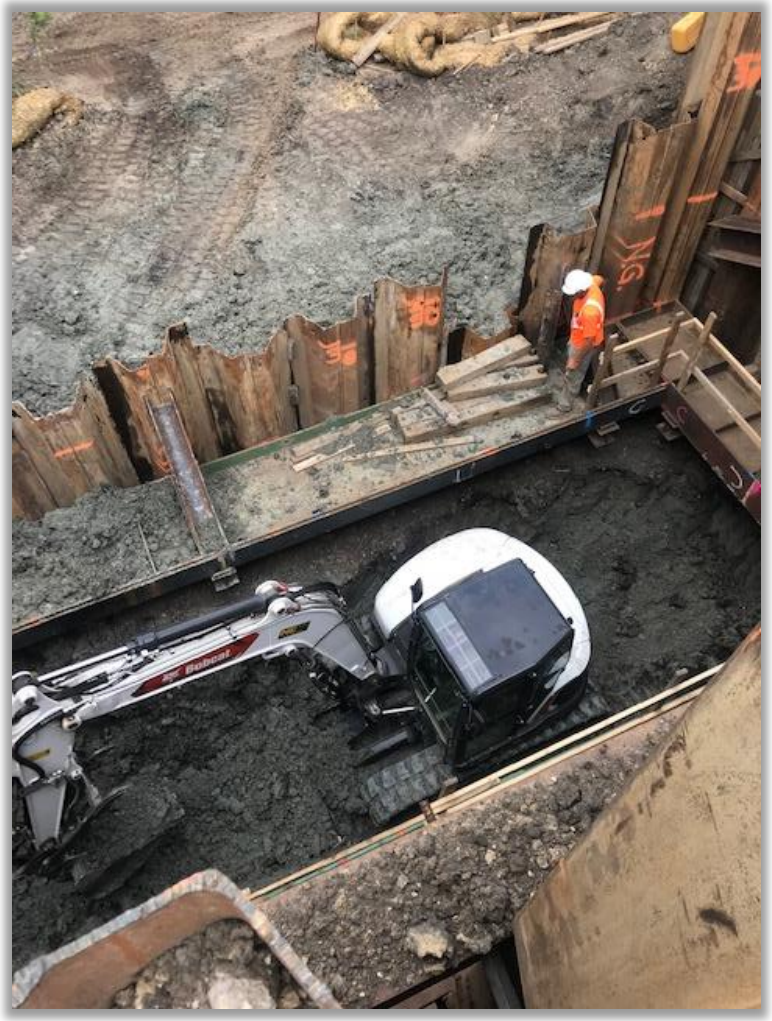
CRAMER & Associates Inc.

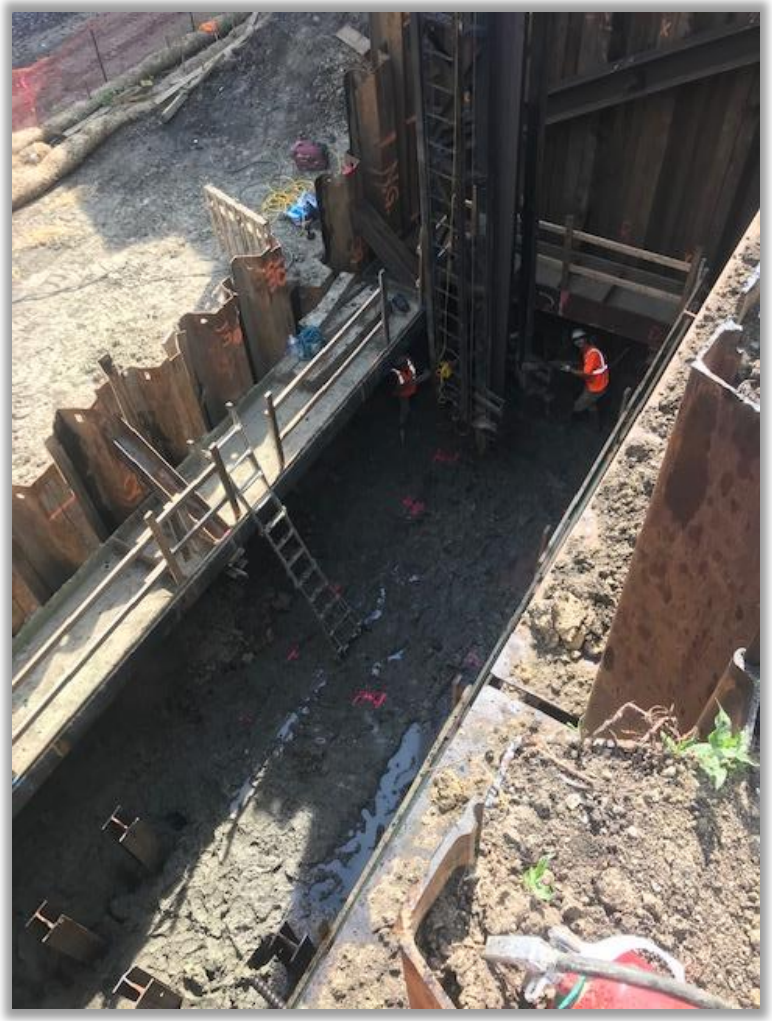
Dallas County Median Bridge



CRAMER & Associates Inc.

Dallas County Median Bridge

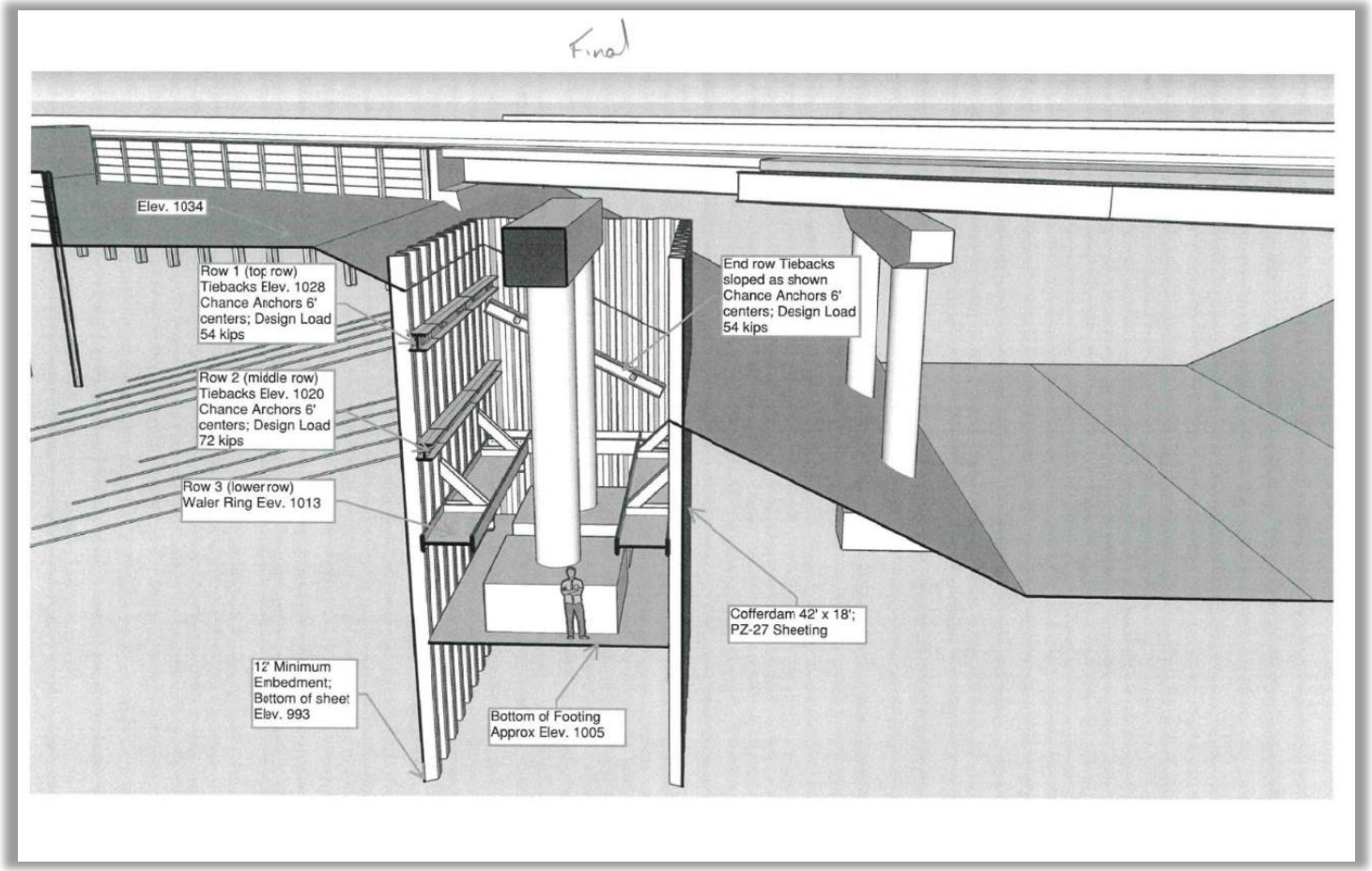




CRAMER & ASSOCIATES INC.

What Am I Using a 3D Model For?

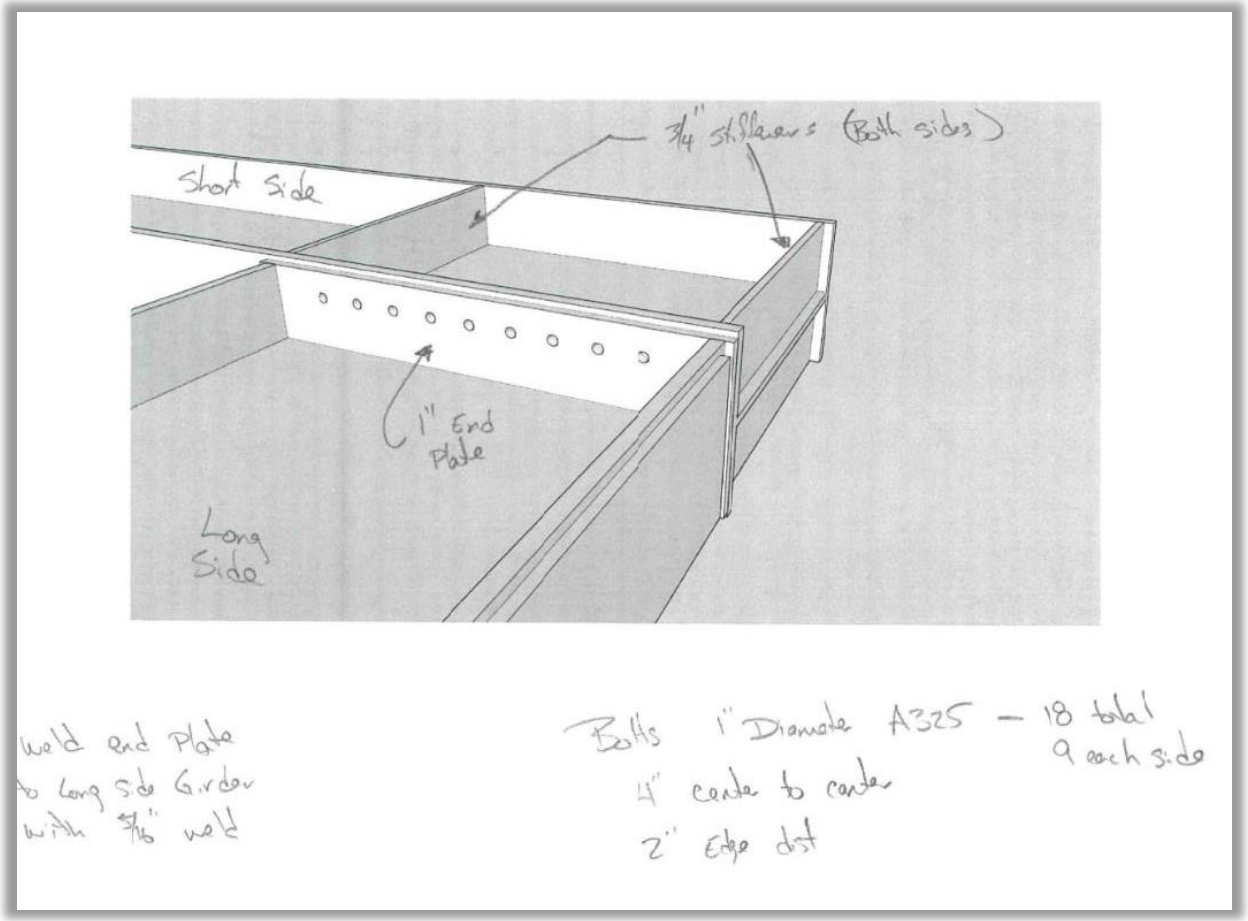
- A design tool
- A communication tool
- To help produce PDF drawings
- Measurements



CRAMER & ASSOCIATES INC.

What Am I NOT Using a 3D Model For?

- Measurements
- NOT a controlling document
- I am NOT providing 3D file to anyone
- Still using hand drawings for details like rebar



Value of Digital Delivery

BID ORDER	PROPOSAL ID	COUNTY	PROJECT NUMBER	DOWNLOAD
208	97-1403-705	Woodbury	MP-003-3(712)2--76-75 MP-003-3(713)6--76-75 MP-140-3(705)0--76-97	DOWNLOAD PLANS / PROP
301	25-0803-282	Dallas	IM-080-3(283)118--13-25 NHS-080-3(282)118--11-25 NHS-080-3(284)121--11-25	DOWNLOAD PLANS / PROP DOWNLOAD ROAD E-FILES DOWNLOAD BRIDGE E-FILES
302	68-0346-103	Monroe	NHSN-034-6(103)--2R-68	DOWNLOAD PLANS / PROP
303	85-0305-276	Story	NHSX-030-5(276)--3H-85 NHSX-030-5(277)--3H-85 NHSX-030-5(291)--3H-85	DOWNLOAD PLANS / PROP DOWNLOAD ROAD E-FILES DOWNLOAD ROAD E-FILES DOWNLOAD

CRAMER & Associates Inc.

Contract Documents

- Currently
  - PDF plans
  - PDF proposal/special provisions

25-0803-284_C.pdf

DS-15005.pdf
DS-15098.pdf
DS-15099.pdf
estprop301.pdf
SP-150914.pdf
SP-150919.pdf
SS-15012.pdf
util301.pdf

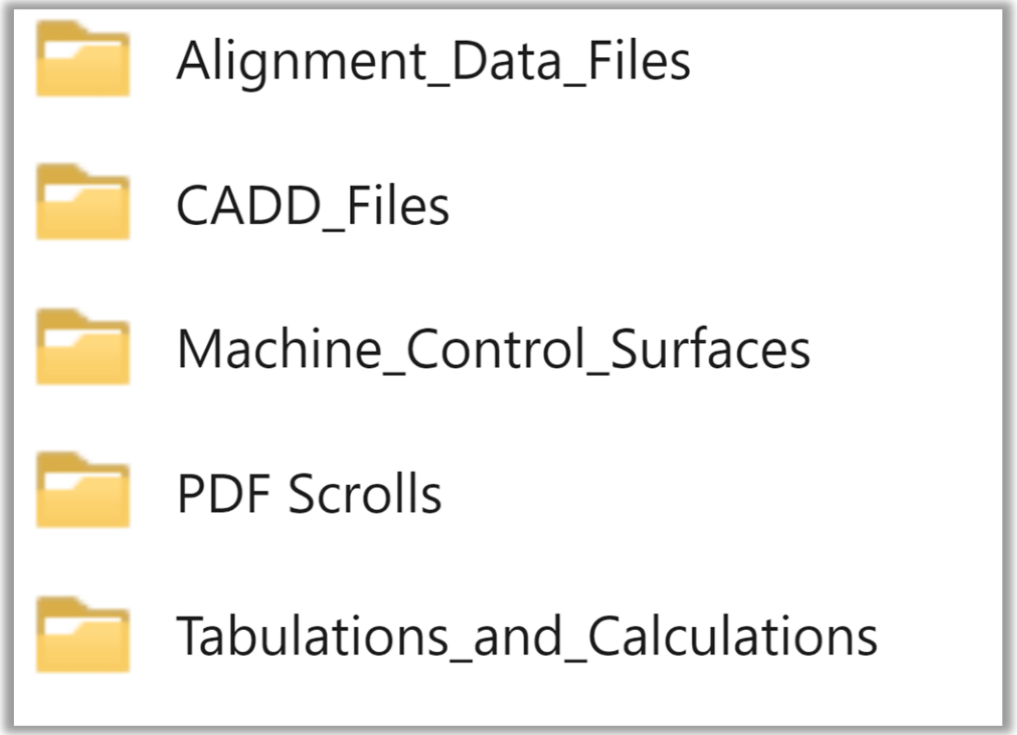
Bridge E-Files (For Information Only)

- Currently
  - Mix of file types
  - As-builts
  - Deck grades

25-0803-284_Bridge Deck Grade Adjustment Spreadsheet_123.xlsx
25-0803-284_Bridge Deck Grade Adjustment Spreadsheet_223.xlsx
25-0803-284_Bridge Staking Data_123.csv
25-0803-284_Bridge Staking Data_223.csv
25-0803-284_Existing Plans_Design_313.pdf
25-0803-284_Existing Plans_Design_499.pdf
25-0803-284_Existing Plans_Design_1084.pdf
25-0803-284_Existing Plans_Design_1184.pdf
25-0803-284_Existing Plans_Design_1965.pdf
25-0803-284_PPC Beam Data Spreadsheet_123.xlsx
25-0803-284_PPC Beam Data Spreadsheet_223.xlsx
25-0803-284_Top of Deck Elevations Spreadsheet_123.xlsx
25-0803-284_Top of Deck Elevations Spreadsheet_223.xlsx

Road E-Files – For Information Only

- Currently
  - Mix of file types
  - Graders/Pavers using 3D models
    - 25+ years
    - Still need 2D plan sheets



Consider Where 3D Models Fit

- 3D models can be valuable from a design/planning standpoint
- If there is a 3D model
  - Use it to produce plan sheets if it makes sense to
  - Provide the model for information only
- Will the bridge industry use it?
  - Contractors, subcontractors, suppliers, fabricators
- Large projects or small projects?

Contact Information

Brian Jacob
Cramer and Associates, Inc.
bjacob@cramerbridges.com

CRAMER & ASSOCIATES INC.