



Rehabilitation of the Nenana River Bridge

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Alaska Department of
Transportation & Public Facilities

Nenana River Bridge



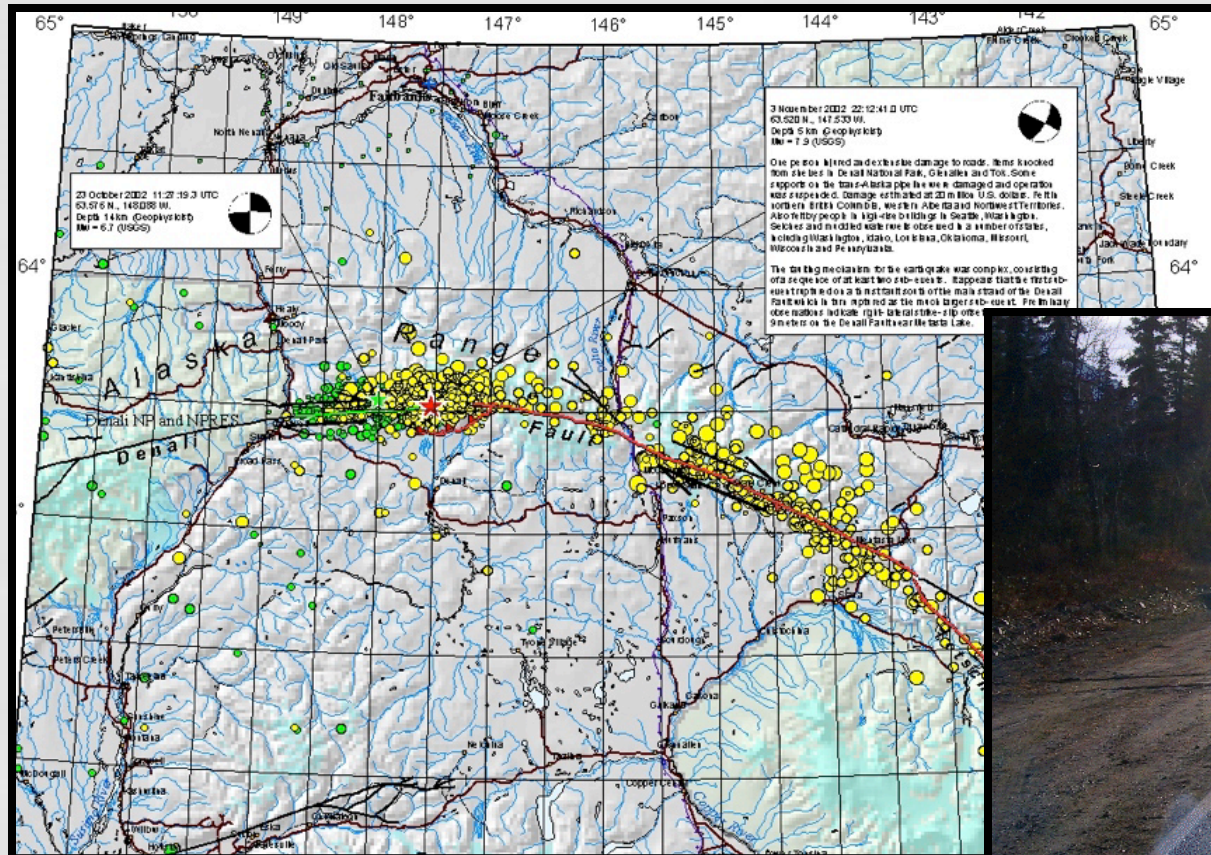
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Rehabilitation

- Formwork Removal from Initial Construction
- Increase Friction on Deck Surface
- Spot Coating Repairs
- Bridge Rail Upgrade
- Extend Catwalks
- Seismic



Seismic Activity



<ftp://hazards.cr.usgs.gov/maps/sigsqs/20021103/20021103.jpg>



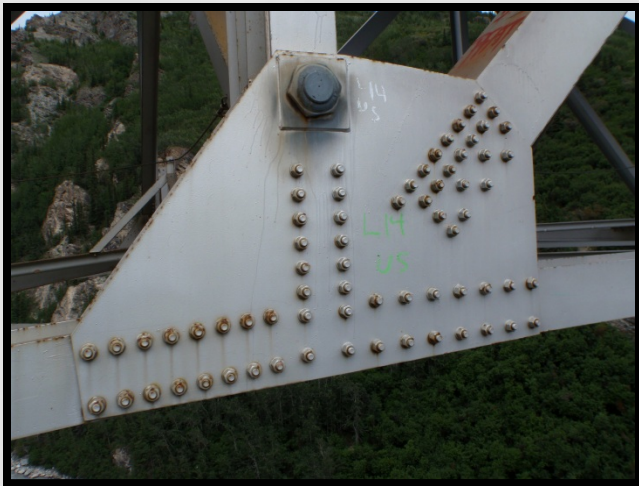
http://earthquake.usgs.gov/earthquakes/eqarchives/year/2002/2002_11_03_images.php



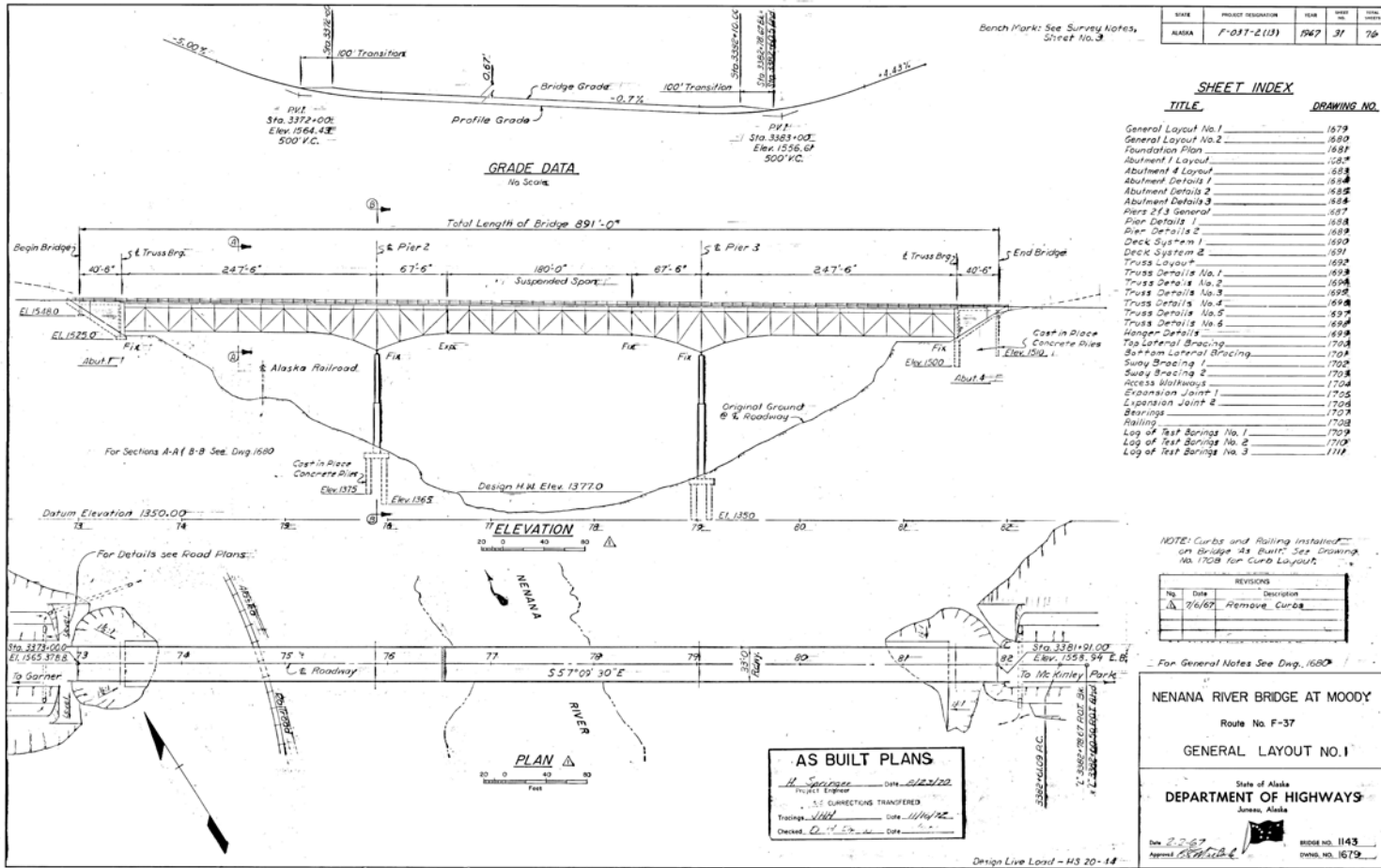
Existing Seismic Deficiencies



Existing Seismic Deficiencies



Seismic Analysis



Seismic Improvements

- Increase Shear Transfer Device
- Restrainer Cables
- Bearing Replacement



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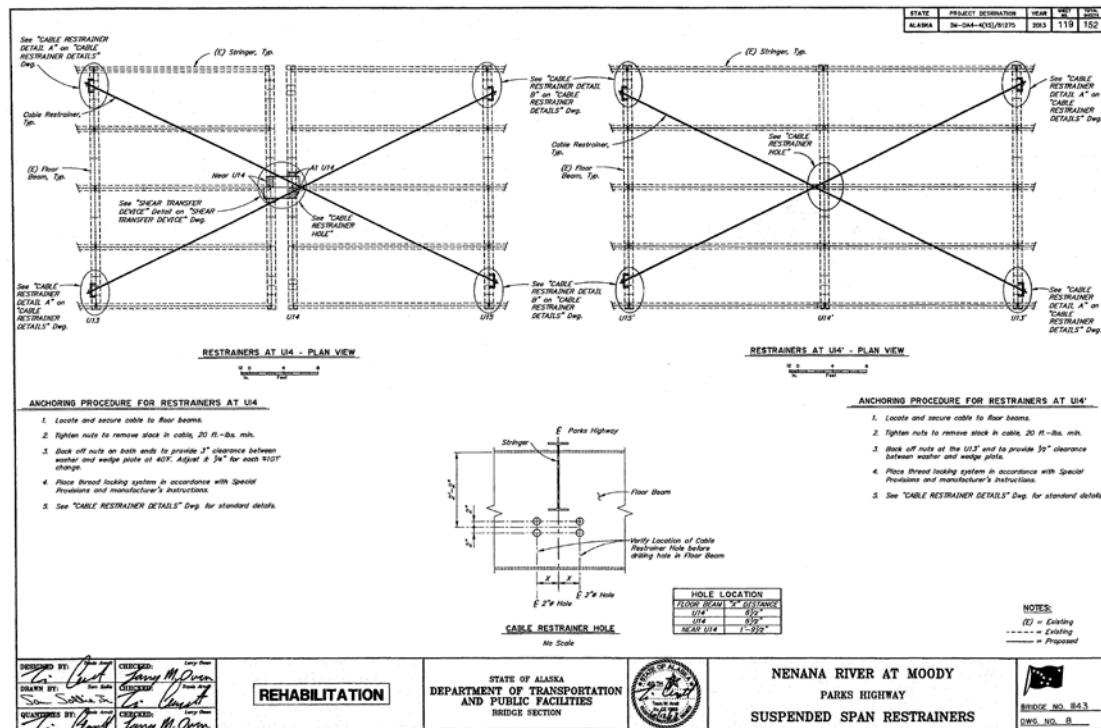
Seismic Improvements

- Increase Shear Transfer Device



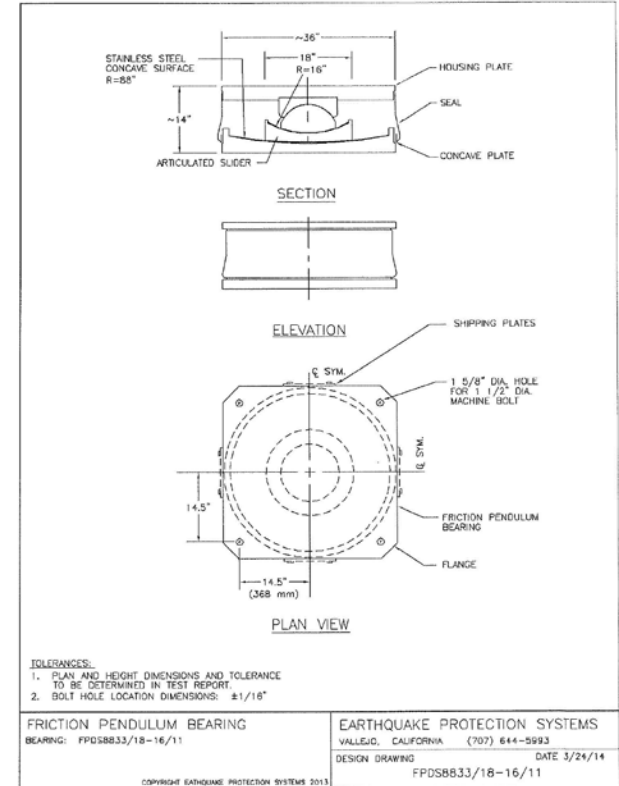
Seismic Improvements

- Increase Shear Transfer Device
- Restrainer Cables

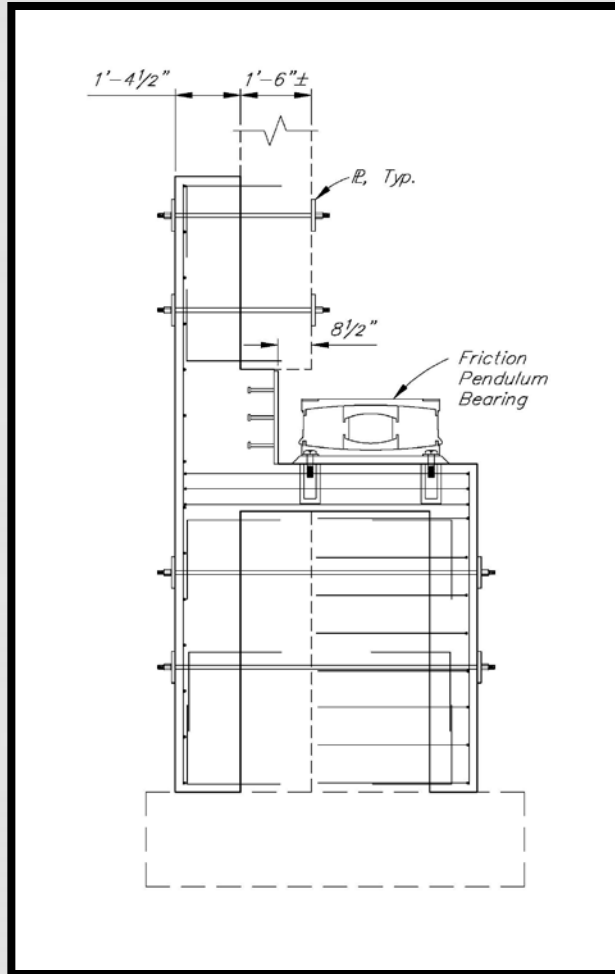


Seismic Improvements

- Increase Shear Transfer Device
- Restrainer Cables
- Bearing Replacement



Abutment Pedestal Modifications

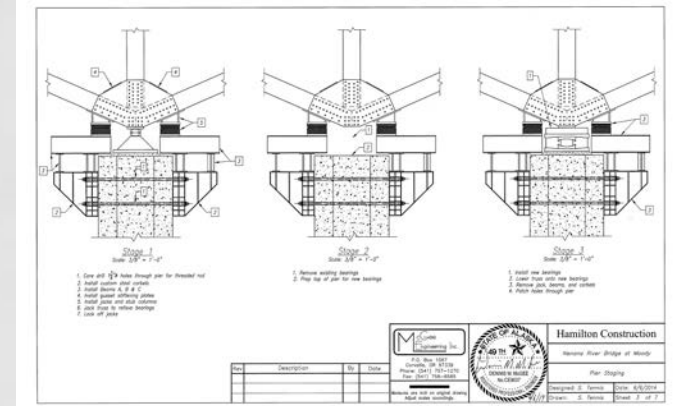
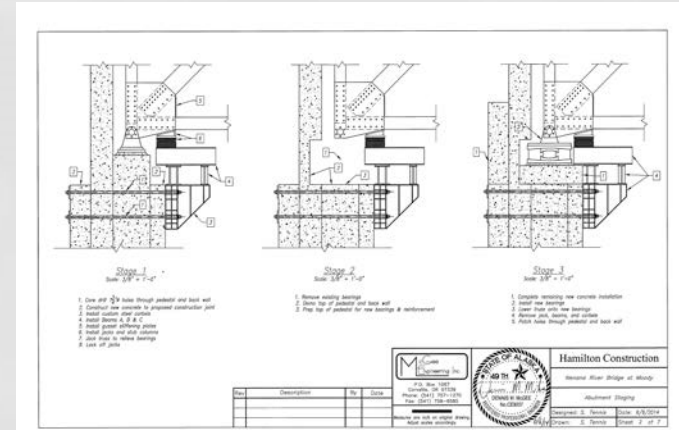
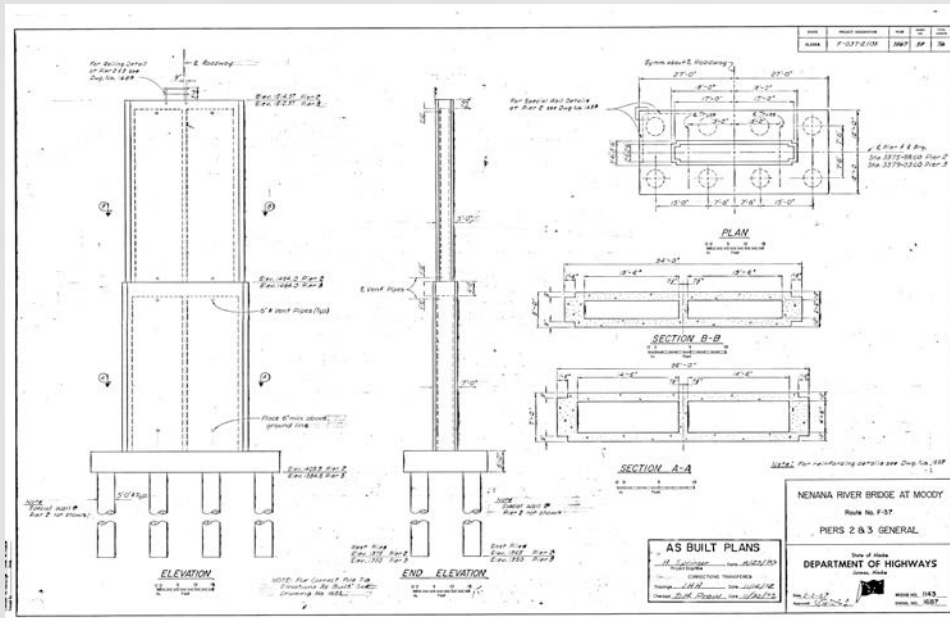


Grout Placement Mock-up

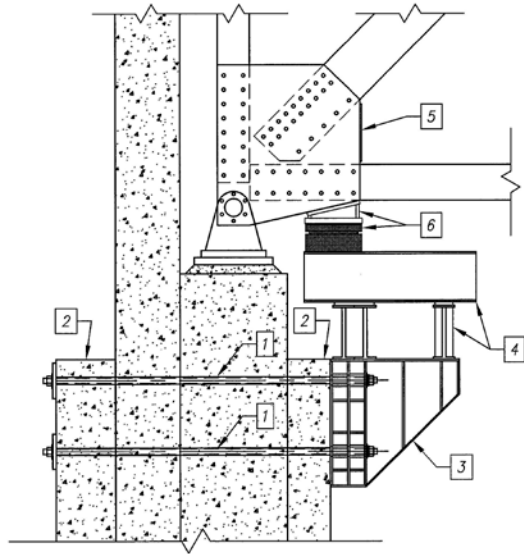


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Lifting Methods



Jacking Frame Installation



Stage 1

Scale: $\frac{3}{8}'' = 1'-0''$

1. Core drill $\frac{3}{4}'' \phi$ holes through pedestal and back wall
2. Construct new concrete to proposed construction joint
3. Install custom steel corbels
4. Install Beams A, B & C
5. Install gusset stiffening plates
6. Install jacks and stub columns
7. Jack truss to relieve bearings
8. Lock off jacks



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Bearing Installation



Bearing Rotation



Frictional Comparison

Material 1	Material 2	Clean & Dry	Lubricated
Steel	Steel	.50 - .80	.16

Table 1: Friction Coefficients for FPDS8833/18-16/11 Bearings 01-08

Production Quality Control Tests				Individual Tolerance			
				f1	f2	f3	
				Min.	0.040	0.080	0.080
				Max.	0.100	0.150	0.150
Individual Averages				Individual Acceptance Criteria Check			
Bearing	f1	f2	f3	f1	f2	f3	
1	0.053	0.110	0.110	Pass	Pass	Pass	
2	0.053	0.109	0.109	Pass	Pass	Pass	
3	0.059	0.107	0.107	Pass	Pass	Pass	
4	0.060	0.103	0.103	Pass	Pass	Pass	
5	0.058	0.101	0.101	Pass	Pass	Pass	
6	0.049	0.106	0.106	Pass	Pass	Pass	
7	0.051	0.101	0.101	Pass	Pass	Pass	
8	0.053	0.115	0.115	Pass	Pass	Pass	
Total Averages				Average Tolerance			
				f1	f2	f3	
				Min.	0.050	0.090	0.090
				Max.	0.090	0.140	0.140
Average Tolerance Criteria Check							
				Pass	Pass	Pass	

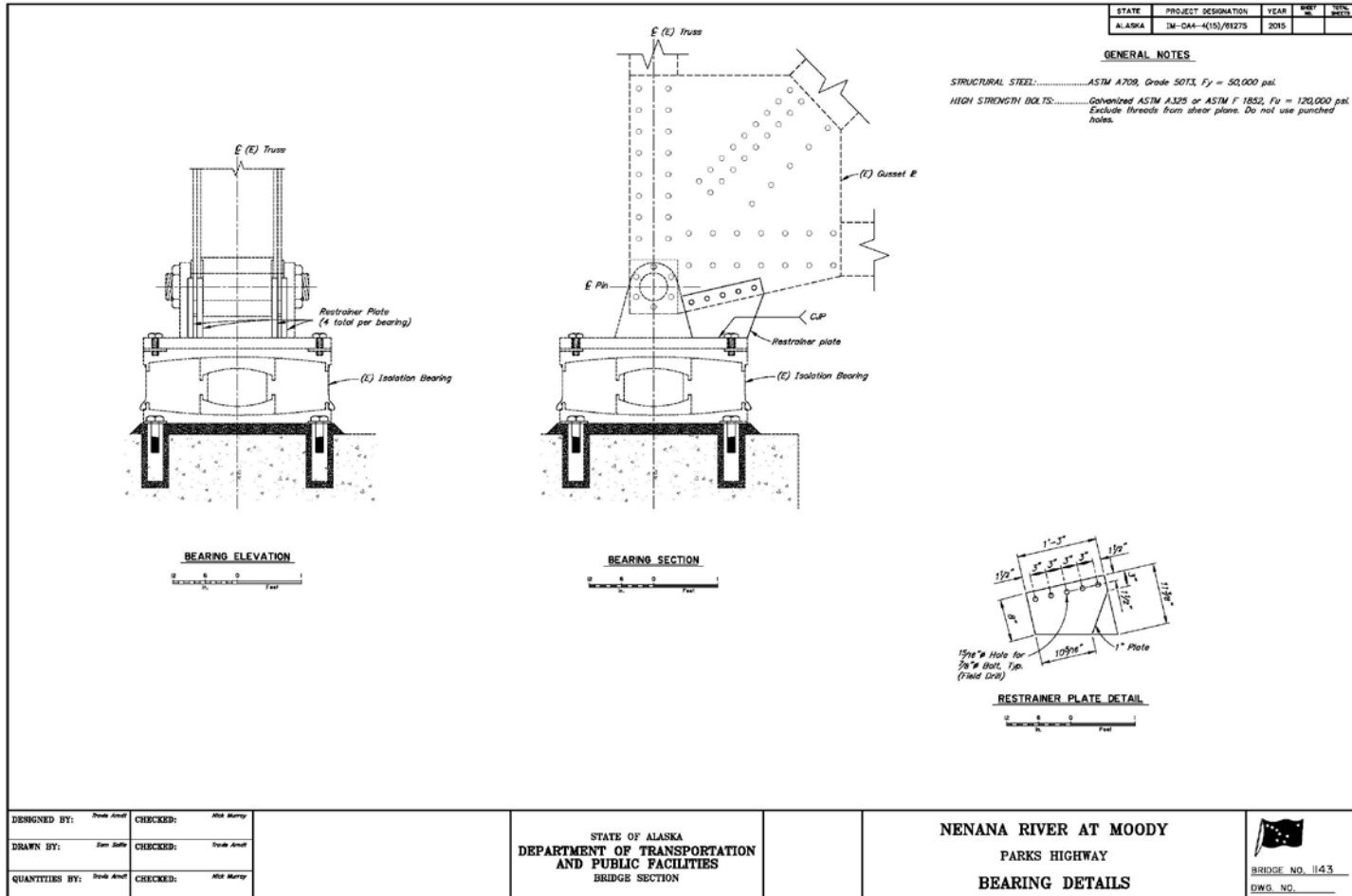


Existing Pin-Pin Bearing



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Retrofit of the Retrofit



Retrofit of the Retrofit



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Completed Bearing Retrofit



Abutment Bearing Assemblies



Questions?

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