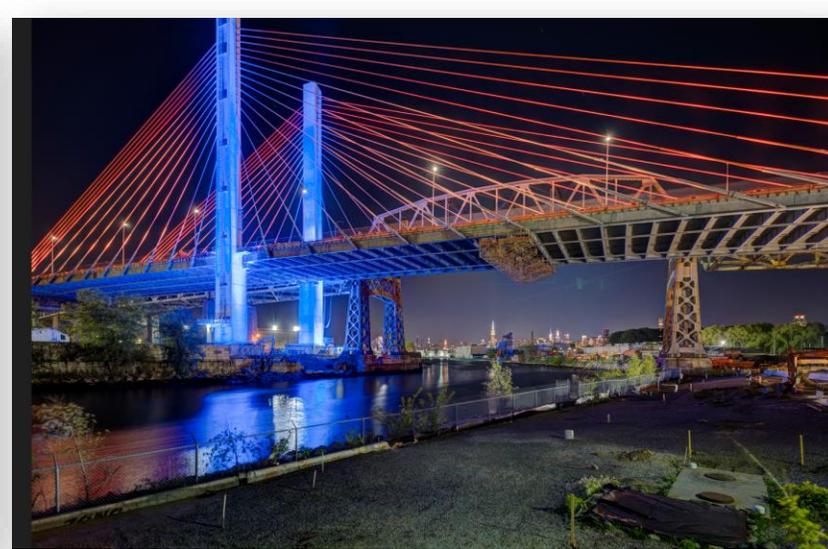


Achieving Excellence in Fabricated Structural Steel *2025 AISC T. R. Higgins Lecture*

71st Annual Structural Engineering Conference
Kansas Memorial Union
Lawrence, Kansas
5 March 2026

Ronnie Medlock, PE
VP Technical Services
High Steel Structures, Lancaster PA





Texas DOT, 1988





First “coaching” from first inspector assigned to train me:

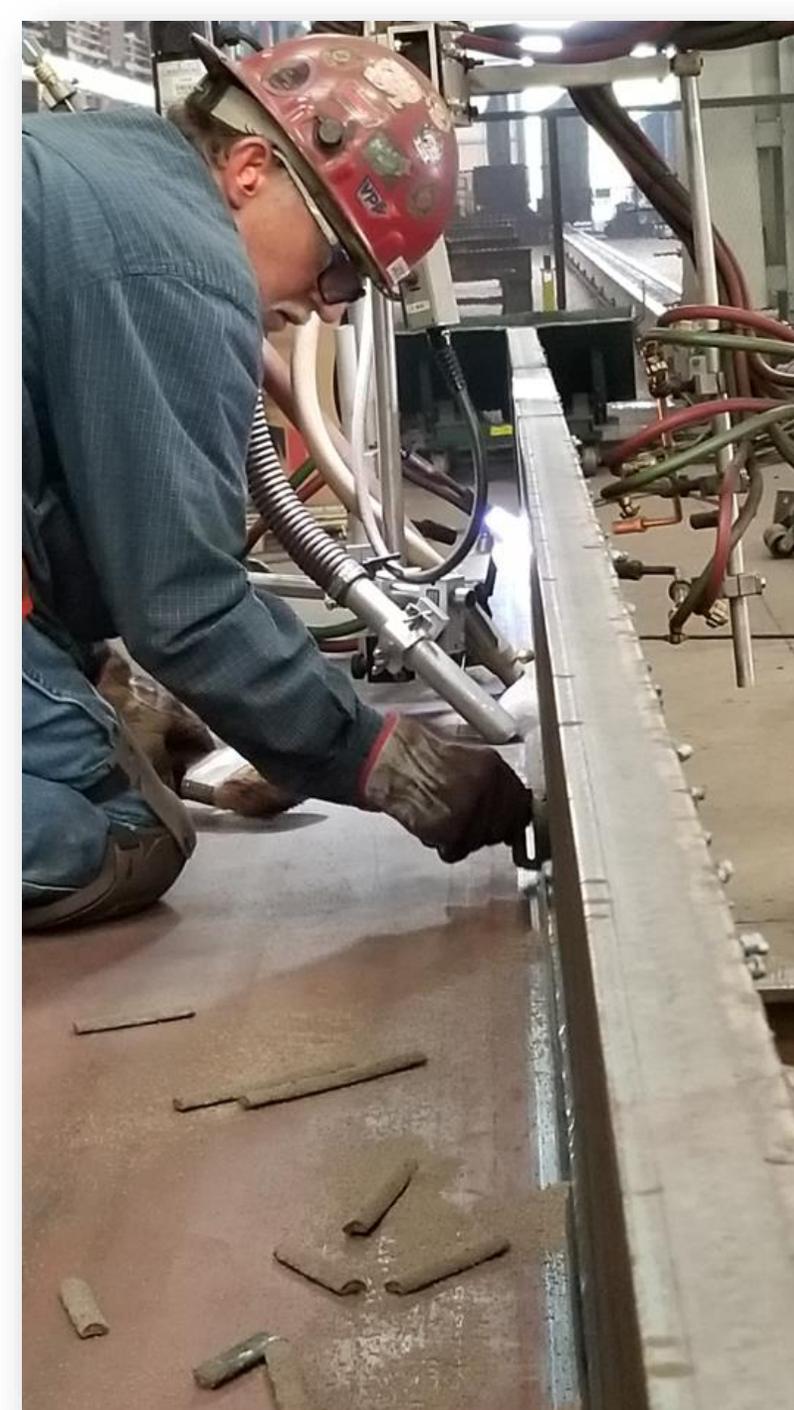
“If the shop is not mad at me, I’m not doing my job”



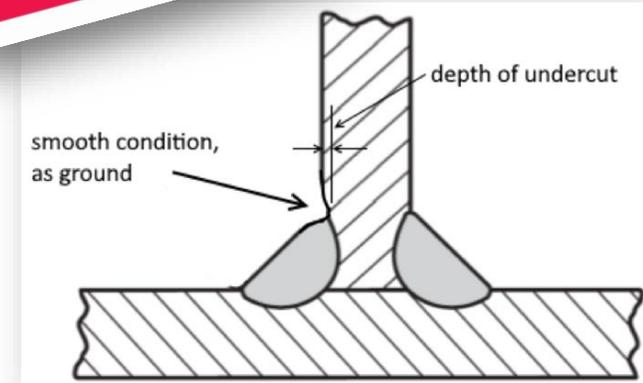
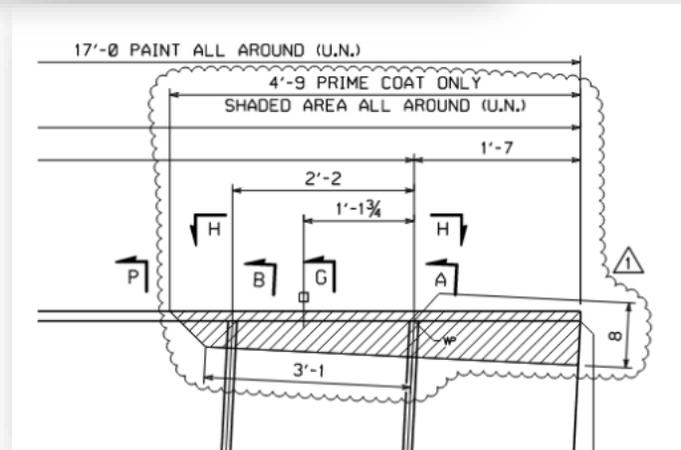
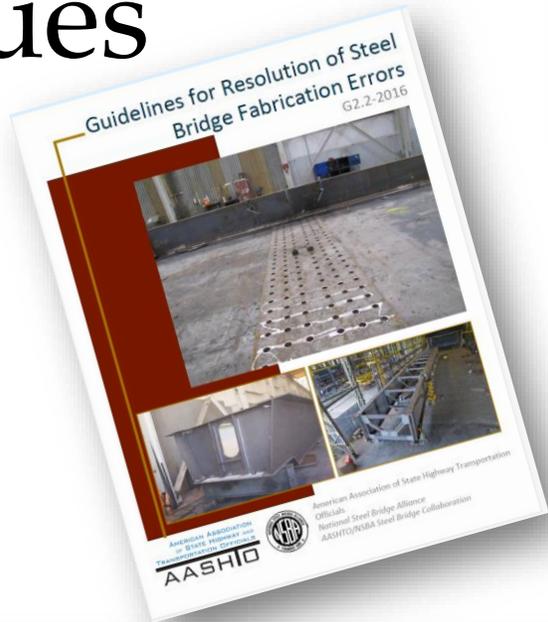
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02/15/

Quality

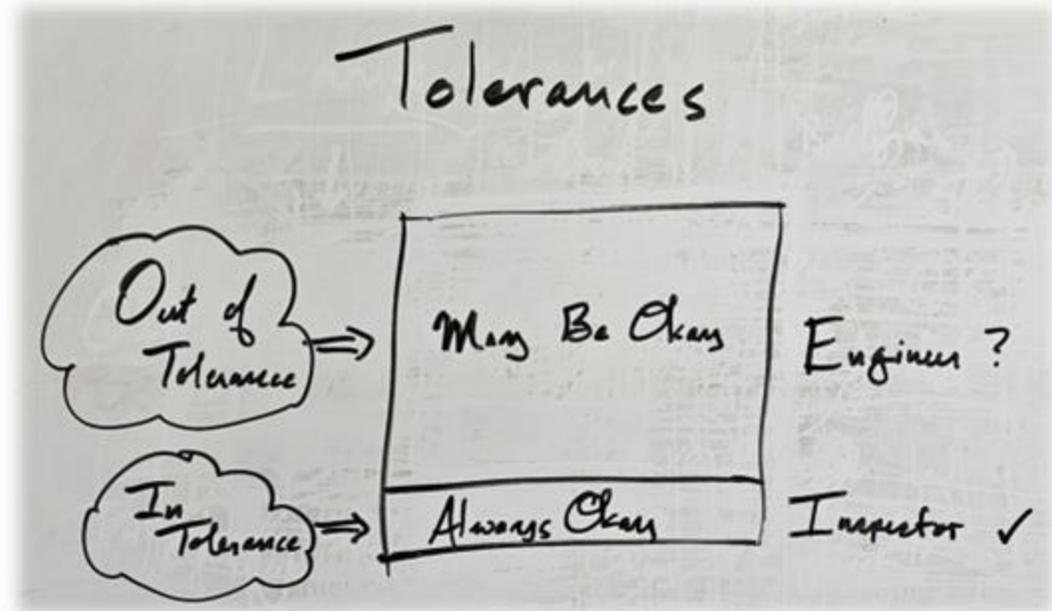
- Who controls quality?
- What should everyone else be doing?



Conformance Issues



Tolerances and Acceptance: Inspector versus Engineer



Tolerances



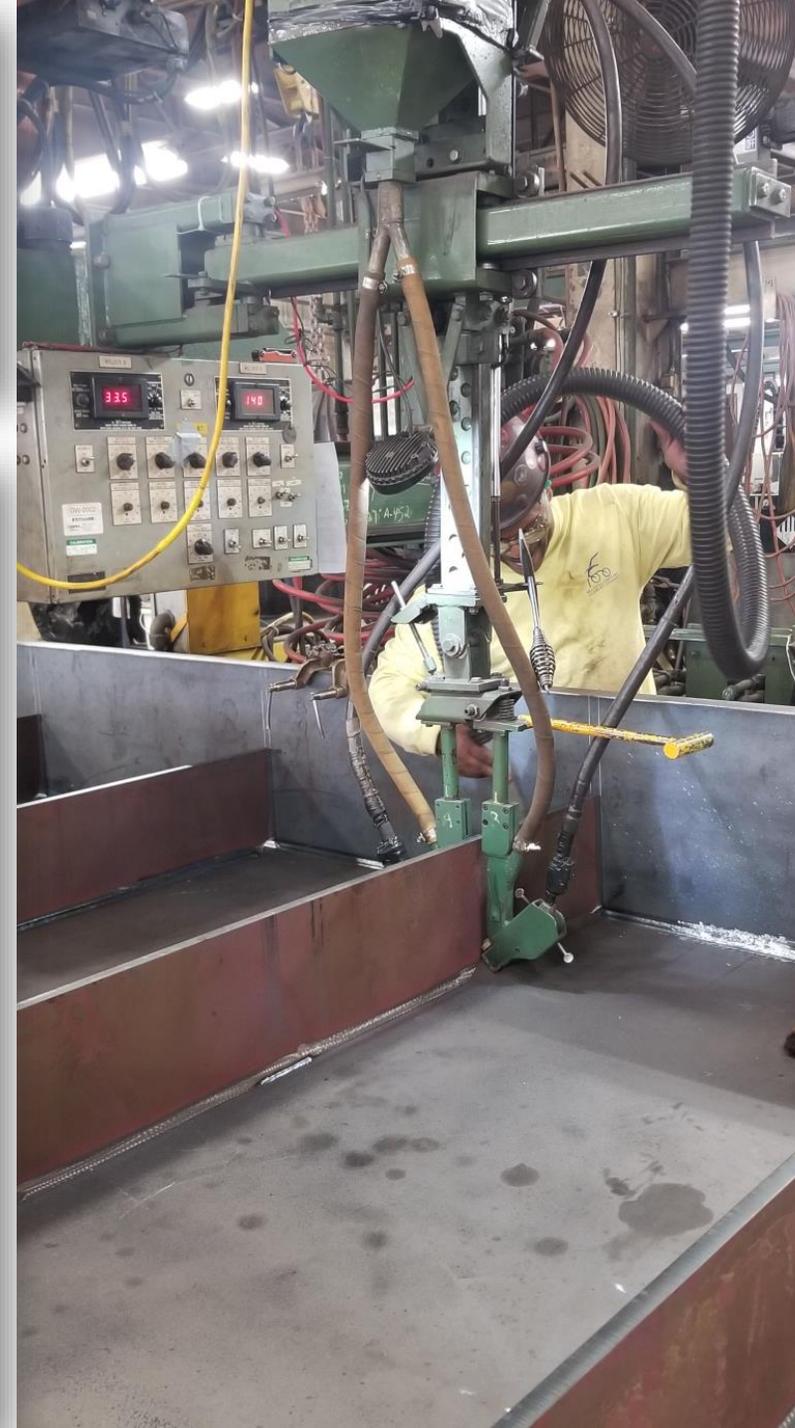
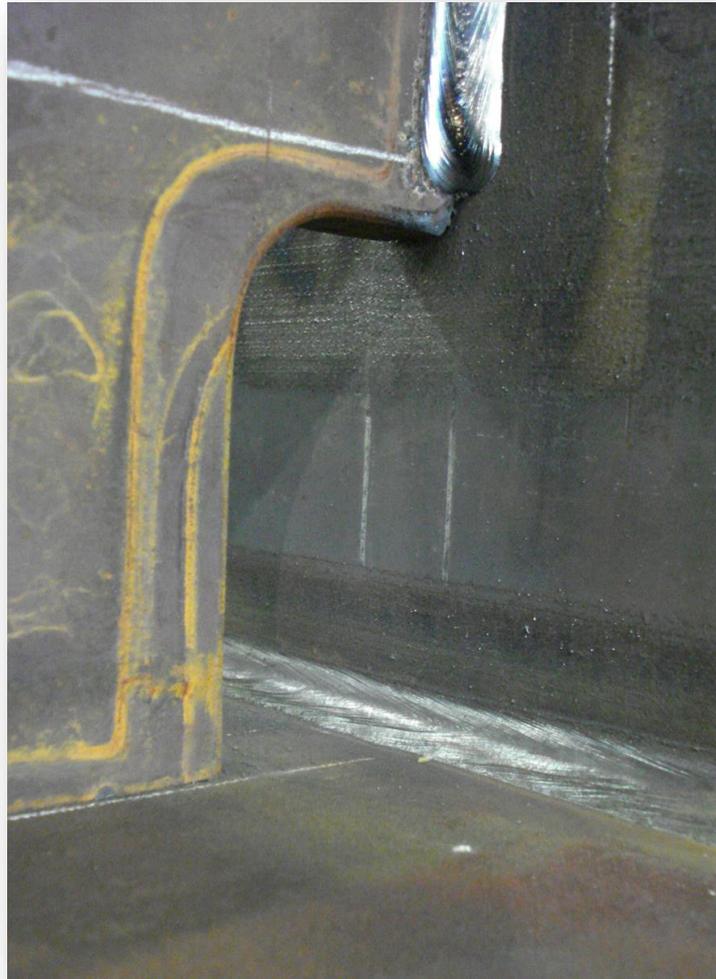
Standardization

Why is standardization in fabrication so beneficial?

Standardization



Excellence



Texas Steel Quality Council, 1995

Representatives:

- TxDOT
 - Bridge Division
 - District Bridge Engineers
 - Materials / Inspection
- Fabricators working for Texas
- Detailers working for fabricators
 - Walter Gatti, Tensor Engineering
- Steel Mills
- NSBA / AISC
 - Fred Beckmann
- Academics
 - Karl Frank

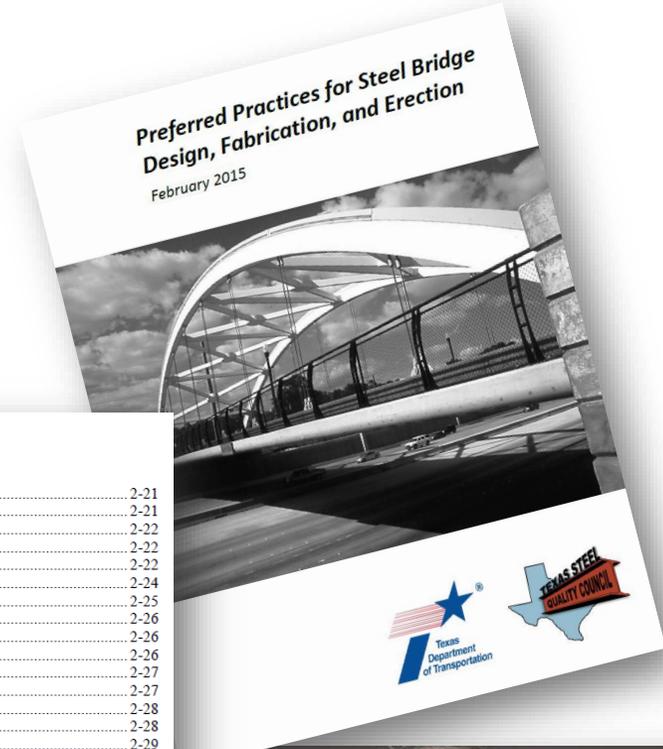
Preferred Practices for Steel Bridge Design, Fabrication, and Erection

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Preferred Practices for Steel Bridge Design, Fabrication, and Erection

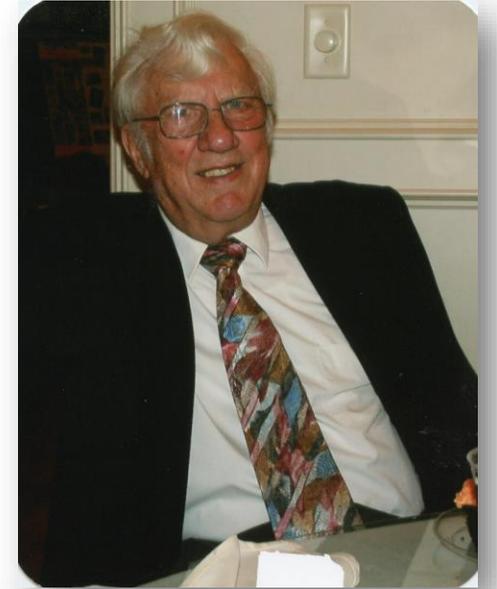
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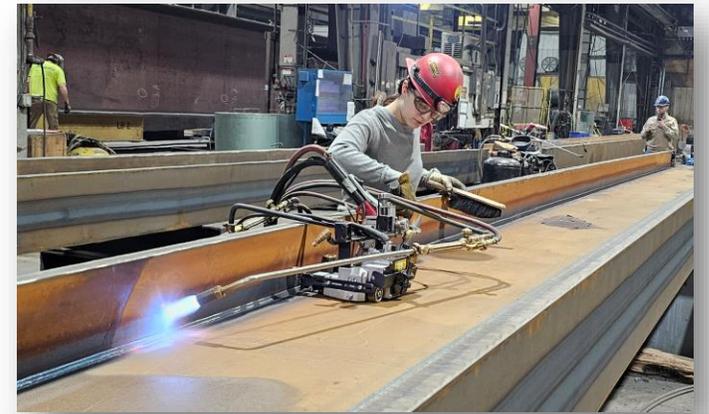
AASHTO/NSBA Steel Bridge Collaboration, 1997

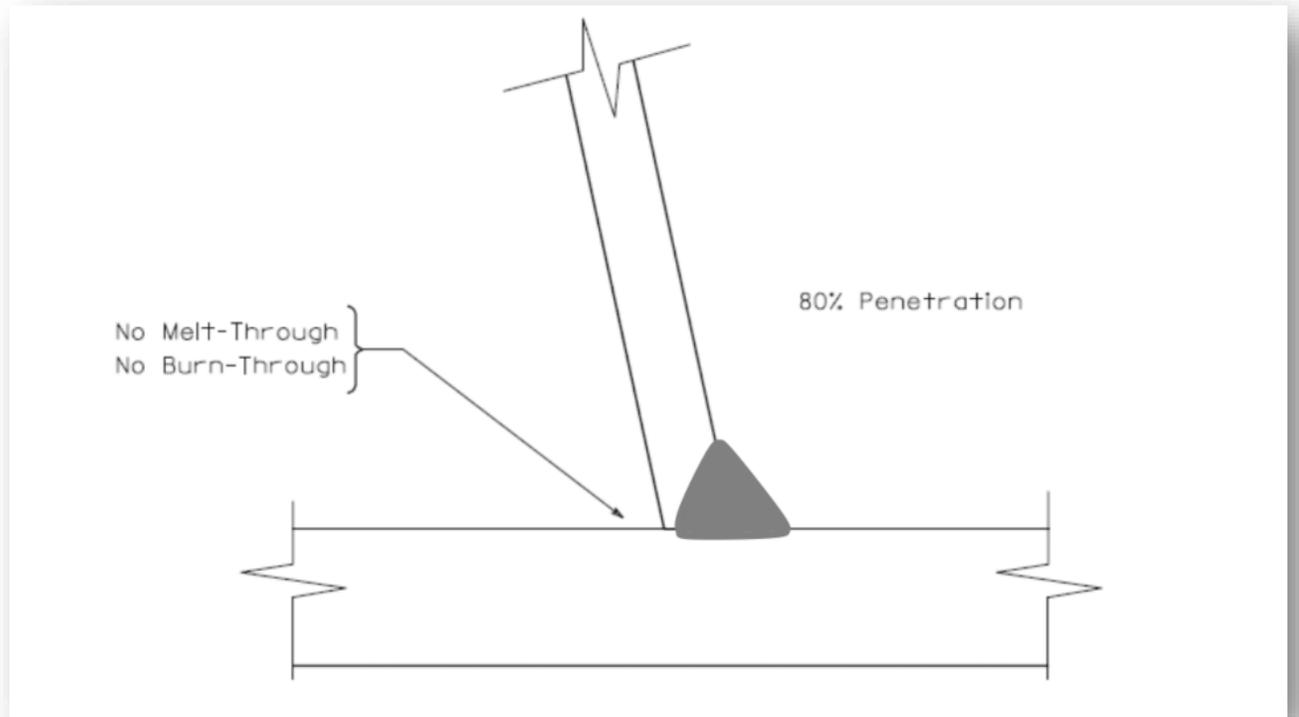
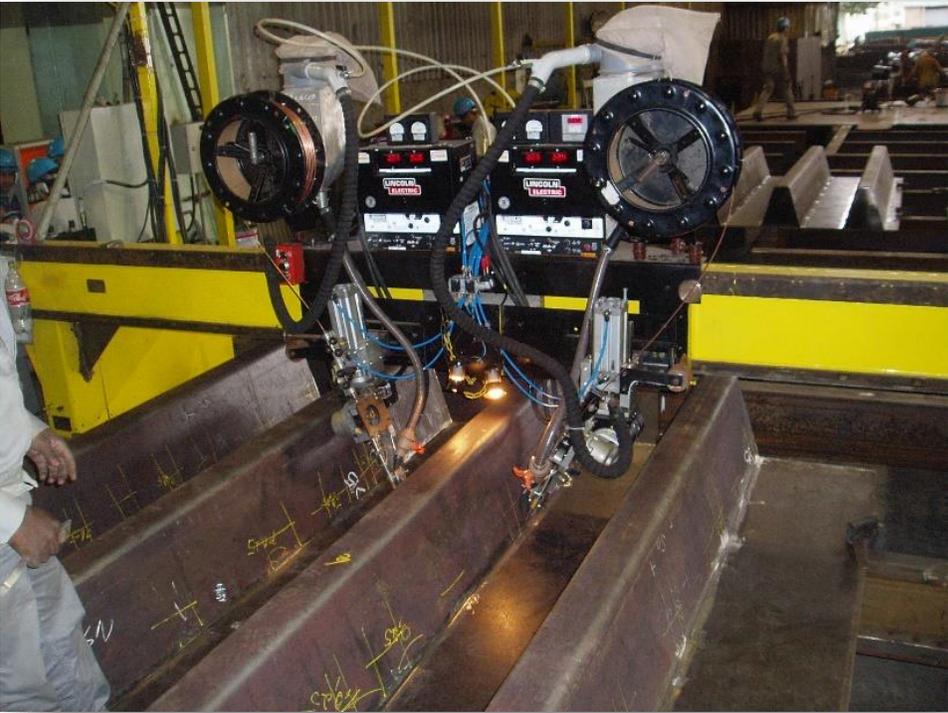
Can we get all 50 states doing the same thing?

- Now national guides and specifications for
 - fabrication
 - shop repair
 - inspection (by owner, by shop)
 - painting
 - galvanizing
 - metalizing
 - detailing
 - shop drawing review
 - design for constructability
 - analysis
 - rehabilitation
 - BIM for bridges
 - bent cap design
- In the works
 - castings
 - orthotropic decks
 - stainless steel bridges

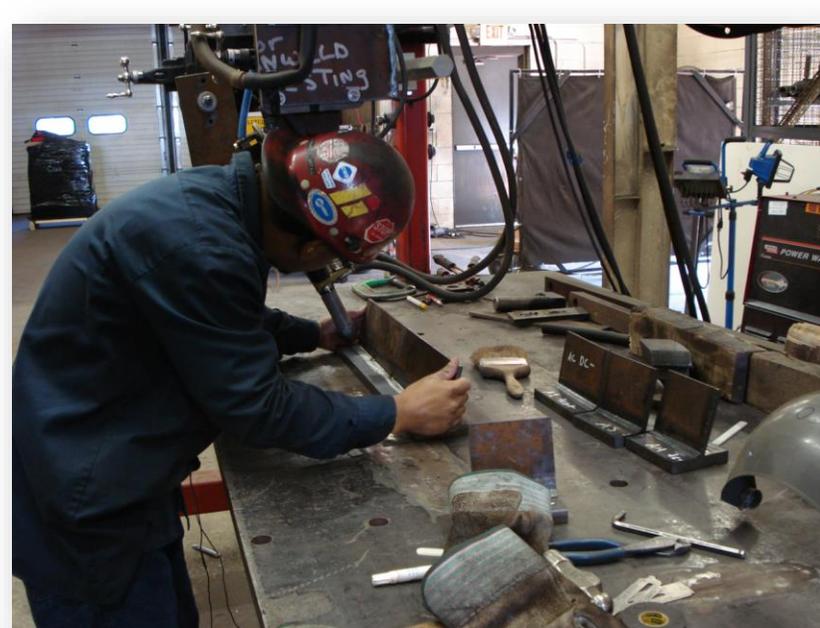


Joined High Steel Structures Lancaster, PA - 2006





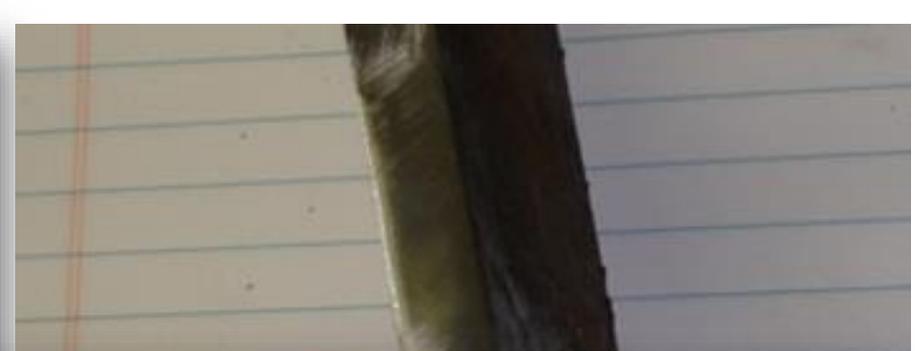
Photos 1, 3, 4, & 5 courtesy of Dave McQuaid



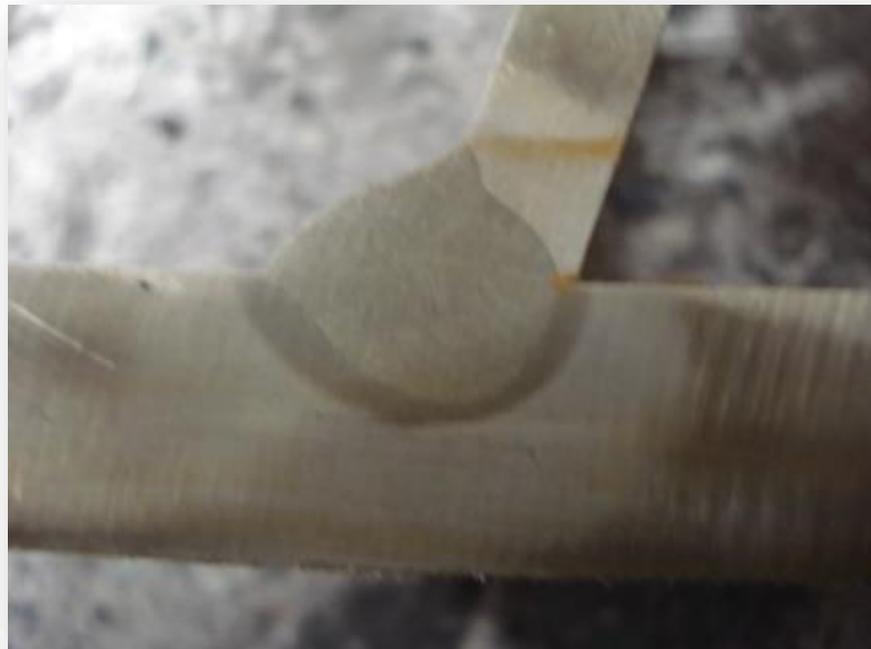
3/32" SAW
wire



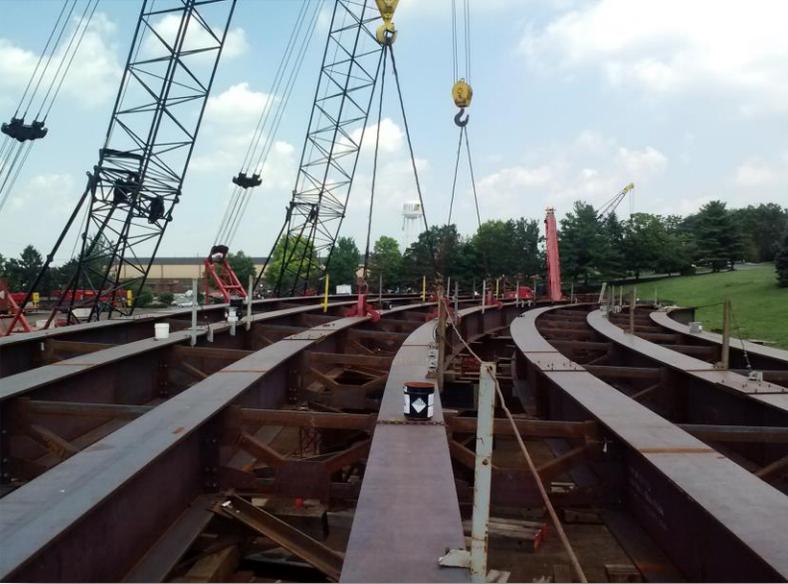
SAW
No Bevel
Single Pass
87% Penetration
No Melt-Through
No Burn-Through



5/32" SAW wire



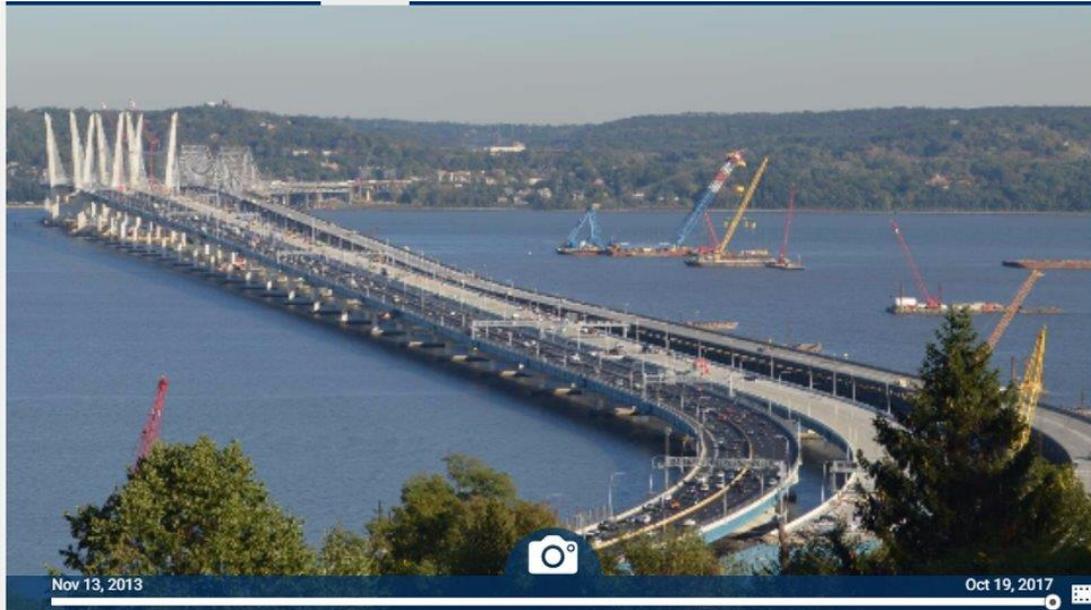
Shop Assembly



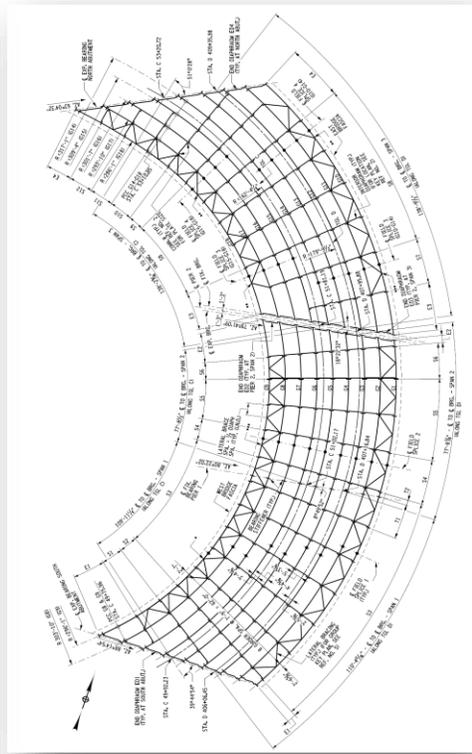
Shop Assembly

- 793 girders, most (12' deep)
- 2852 cross frames (9' x 18')
- 1052 sub-stringers

How much shop assembly?



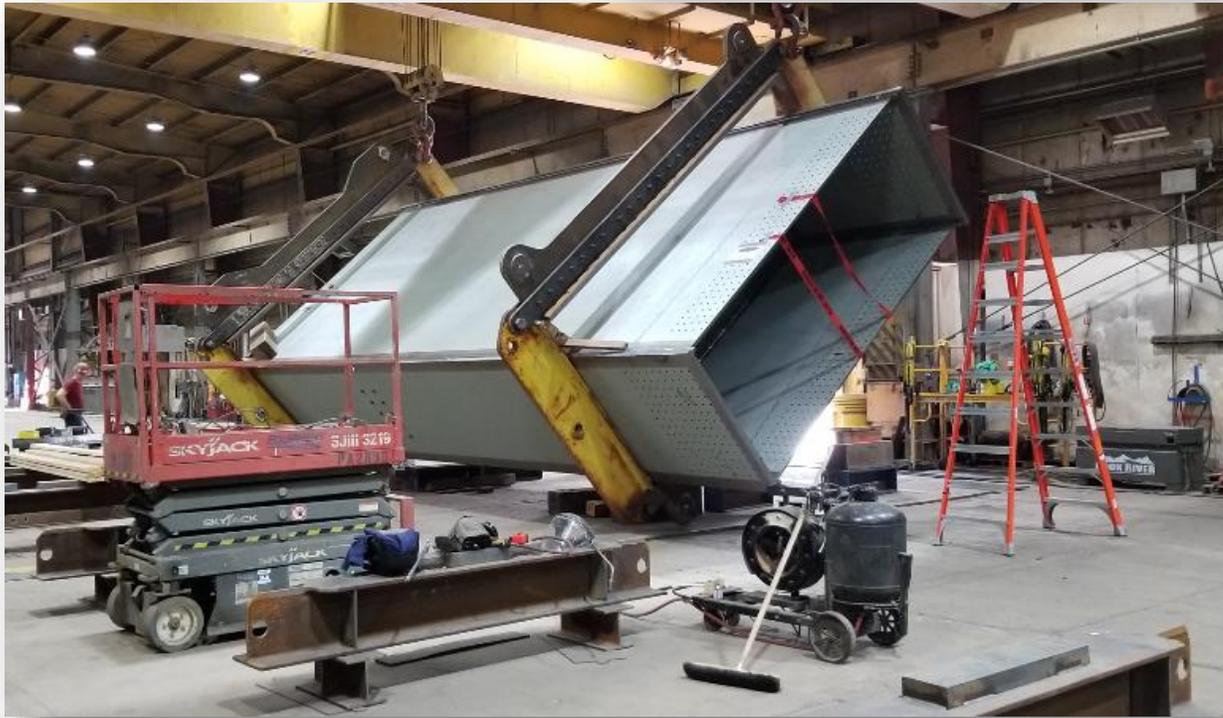
Shop Assembly



Straddle Bent Caps



box with bolted corners



box with welded corners



three I-girder



Schedule

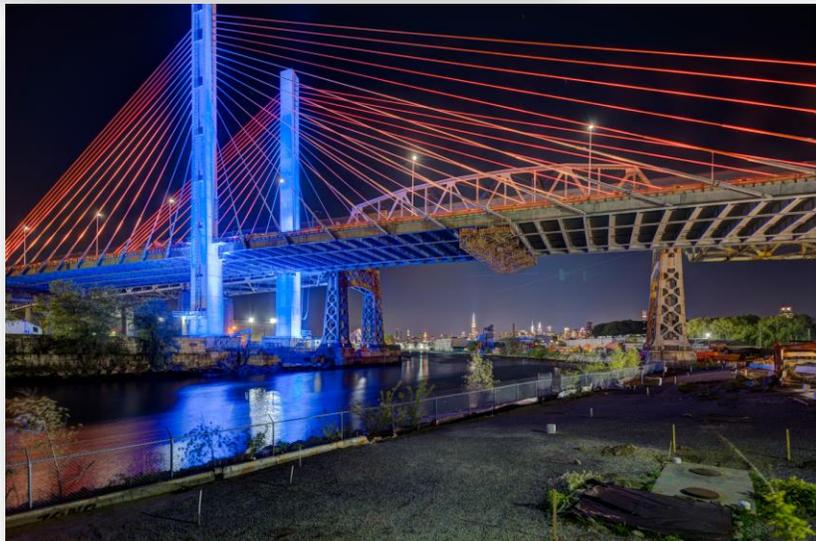
Hours?



Hours?



Hours?



NB		
State	Project	P
PA	1250007	P
MD	1240092	N
PA	1240136	P
NJ	1220209	N
PA	1220203	P
NJ	1230093	N
PA	1220169	P

SB		
State	Project	P
PA	1220203	P
MD	1240092	N
CT	1230112	C

Plant 1 & 4		
State	Project	P
NY	1220144	N
PA	1240136	P
NY	1230183	N
MD	1240092	N
NJ	1230093	N
CT	1250010	C
NJ	1240083	N
CT	1230112	C
PA	1220169	P

NB
State

PA		
MD		
PA		
NJ		
PA		
NJ		
PA		

SB
State

PA		
MD		
CT		

Plant 1 & 4
State

NY		
PA		
NY		
MD		
NJ		
CT		
NJ		
CT		
PA		

Yard
State

CT		
NY		
MD		
NJ		
NJ		

PB
State

PA		
PA		
PA		
MD		
MD		
NJ		

Misc. PB
State

NJ		
MD		
PA		

MBN
State

DC		
NY		
CT		
CT		
NJ		

MBS
State

NY		
NY		
NJ		

Yard
State

NY		
NJ		
NJ		

Coatings
State

CT		
CT		
NJ		

MBN		
State	Project	Project Name
DC	1240066	DC, Connecticut Ave. Streetscape & Deckover
NY	1240004	NY Walkkill River
CT	1230112	CT Walk Bridge Lift Span
CT	1230038	CT Walk Bridge Platform
NJ	1240139	NJ Rt. 76/676

MBS		
State	Project	Project Name
NY	1230037	NY, Hamilton Co., Rt. 28 over S. Inelt of Raquette
NY	1240121	NY, Fort Hamilton Parkway over I-278
NJ	1240083	NJ Secaucus Tpke Ramp

Yard		
State	Project	Project Name
NY	1240121	NY, Fort Hamilton Parkway over I-278
NJ	1160253	NJ Camden DP16126 CT#026113020 RT295/42/
NJ	1240083	NJ Secaucus Tpke Ramp

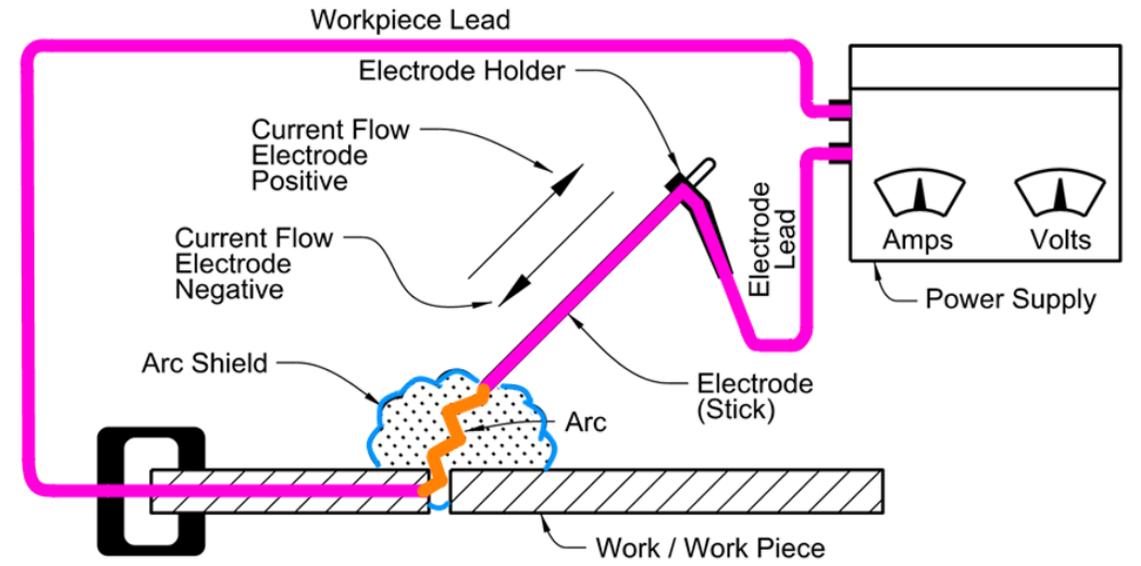
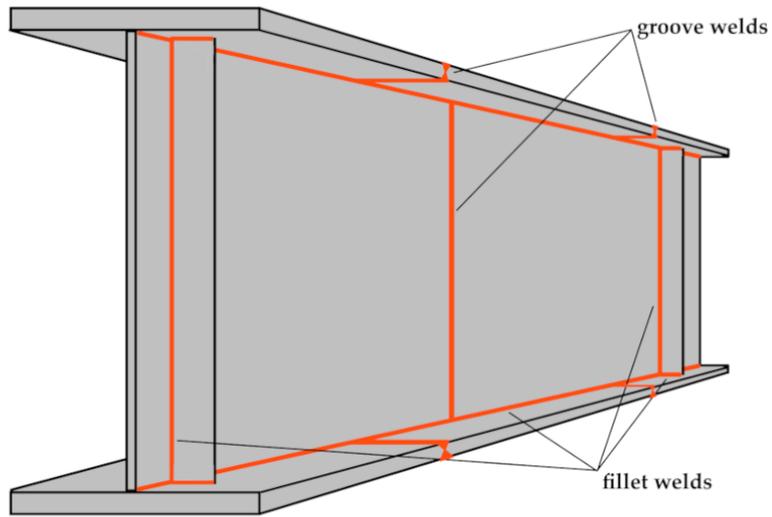
Coatings		
State	Project	Project Name
CT	1230112	CT Walk Bridge Lift Span
CT	1230136	CT Connecticut River RR
NJ	1160253	NJ Camden DP16126 CT#026113020 RT295/42/

Innovation





*Ben Franklin Bridge
Philadelphia, PA
1928*



*Welding
revolution*



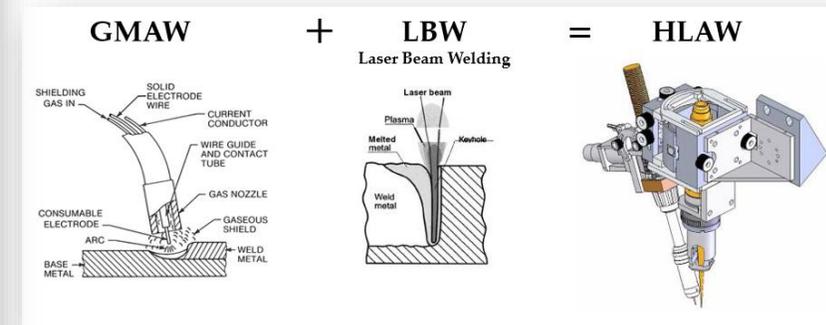
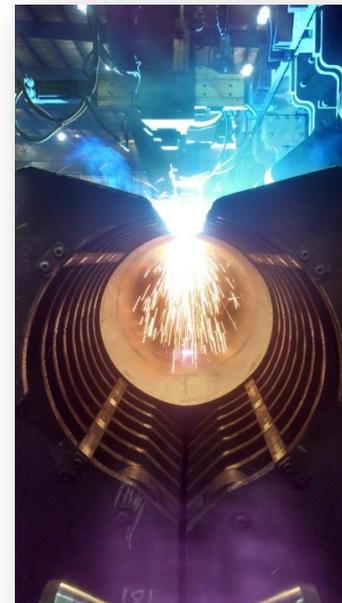
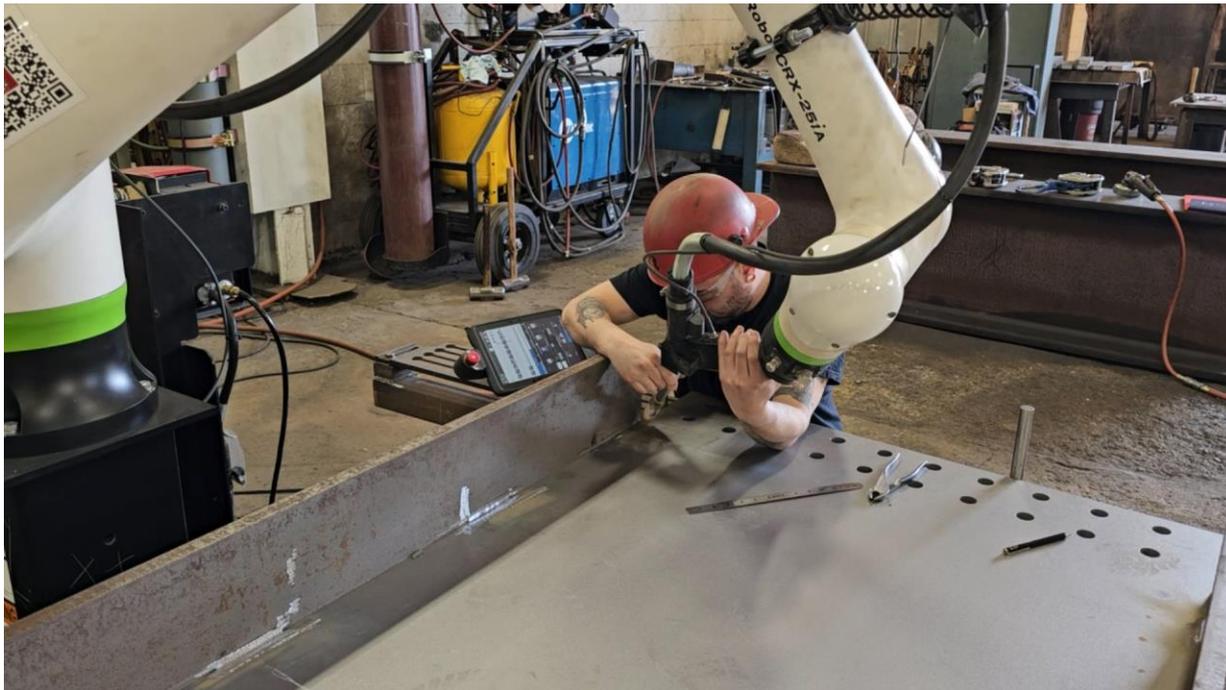
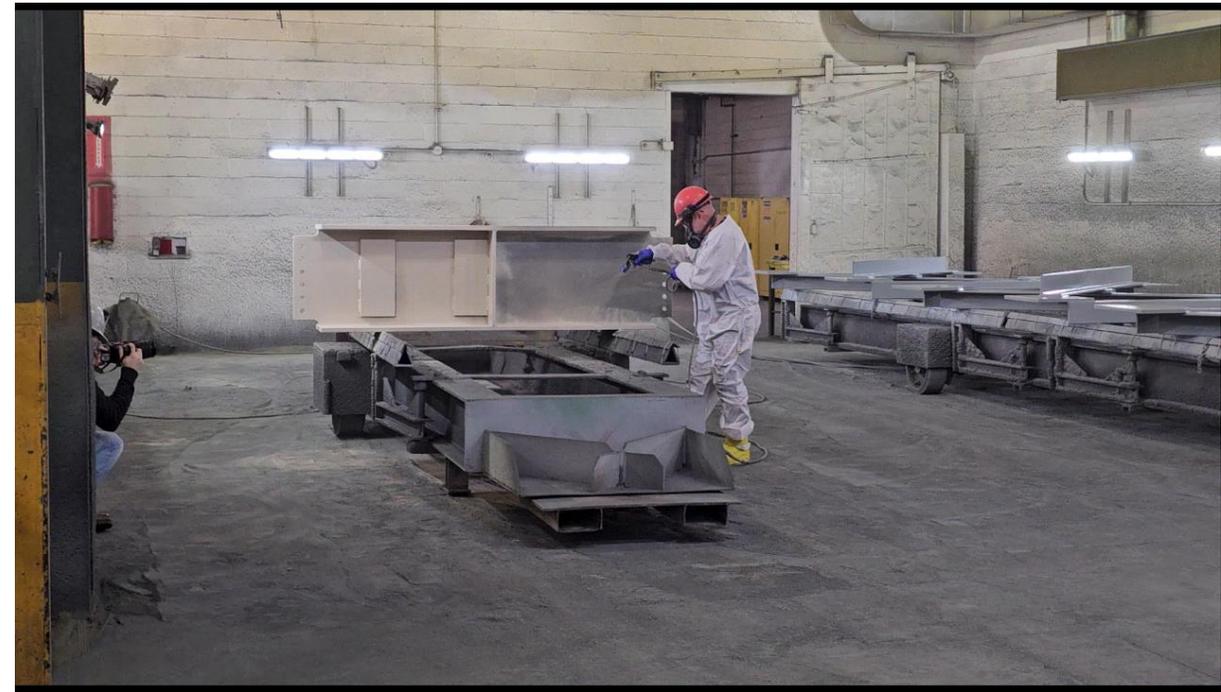
Sanford High Welding Pioneer



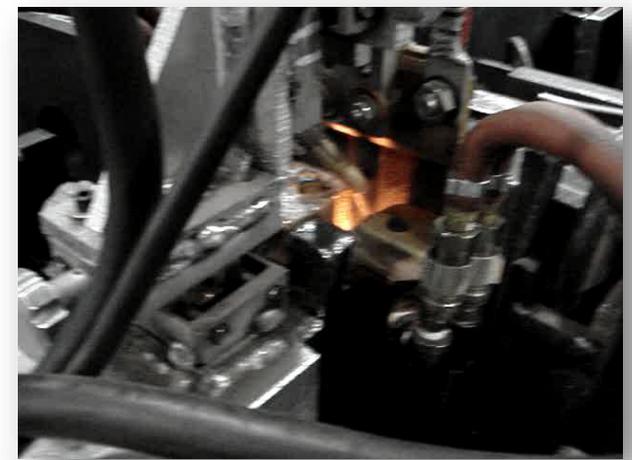
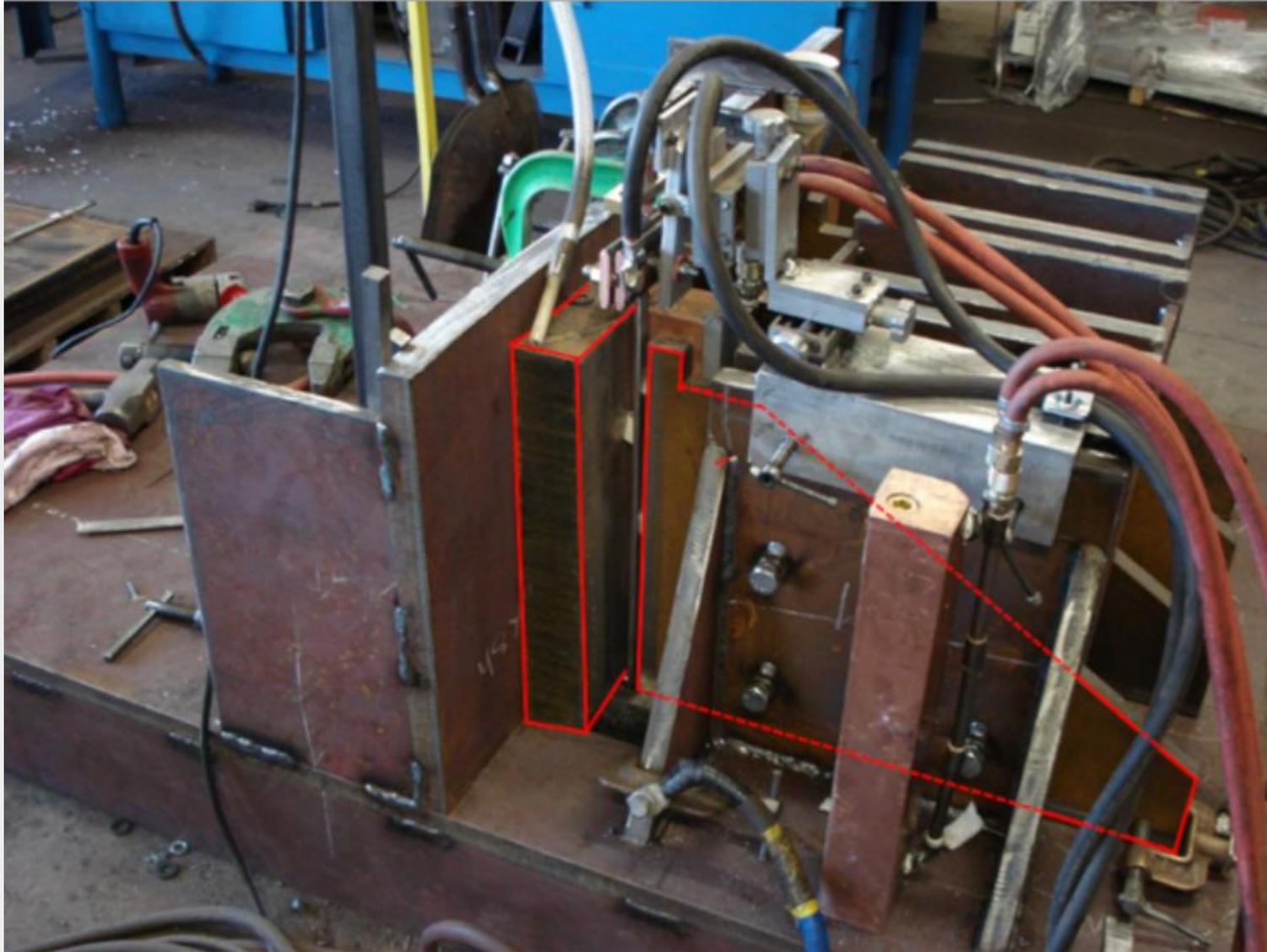
SANFORD H. HIGH (1907-1983)
INNOVATOR CATEGORY • 2015 CLASS

Innovations

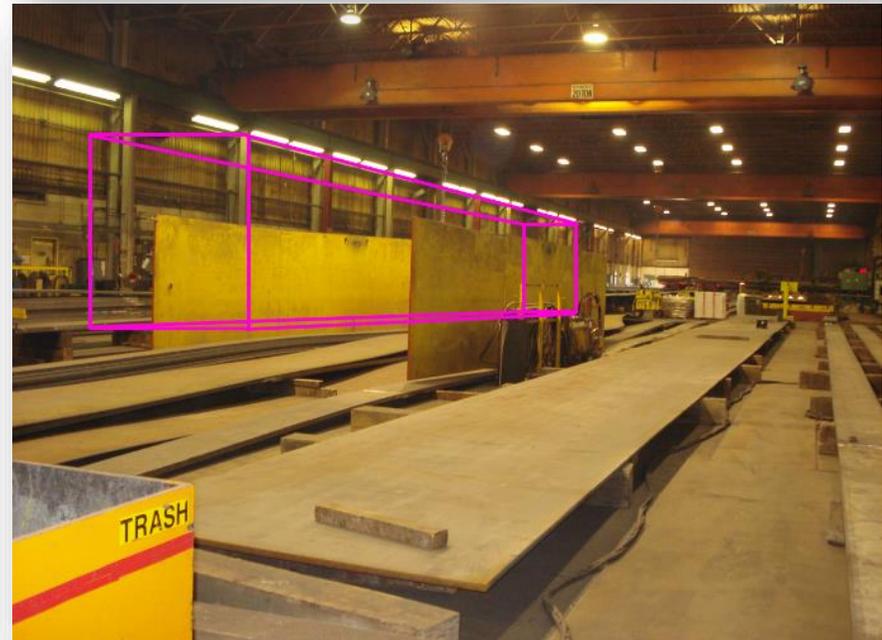
- Two-coat inorganic paint
- COBOT welding
- Hybrid laser-arc welding (HLAW)
- Tele manufacturing



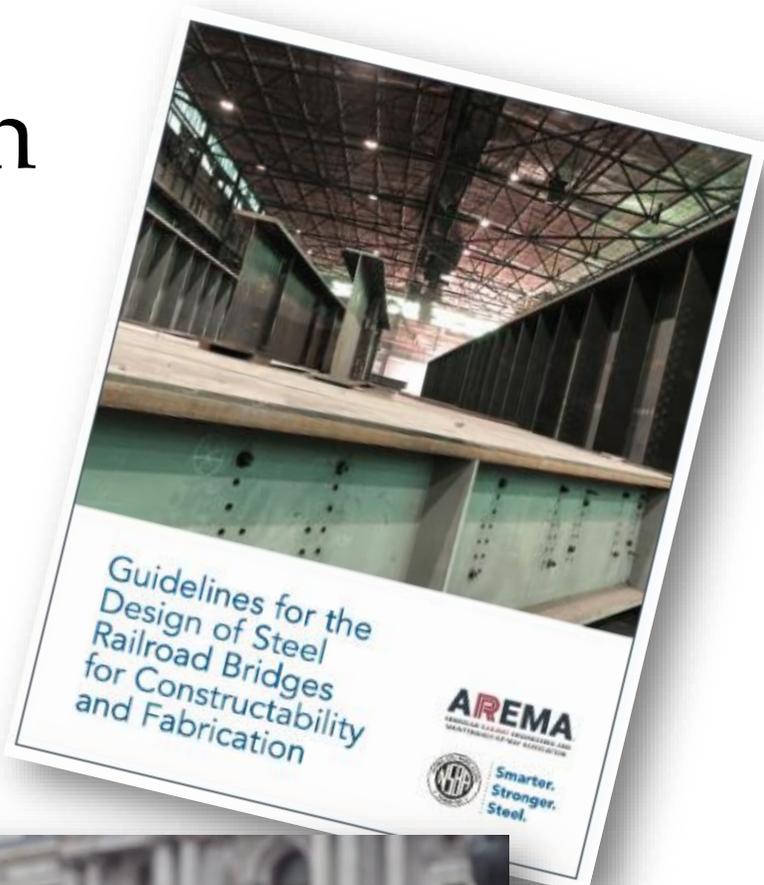
Innovation Challenges

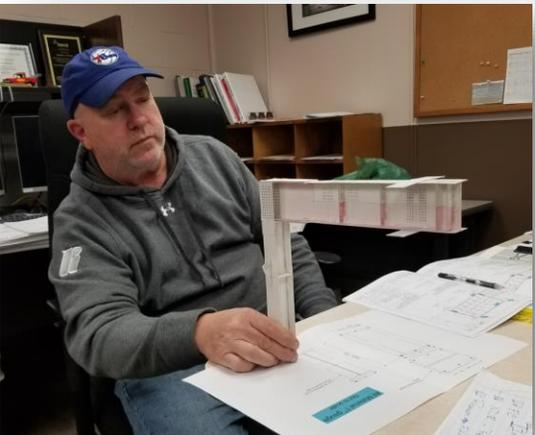


Innovation Challenges



Achieving Excellence in Fabrication





Thank you!

