Navigating the Transition: Wisconsin DOT's Journey to SNBI Compliance

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Wisconsin DOT's Journey to SNBI Compliance

- Discuss WisDOT’s bridge inspection program background
- Discuss SNBI conversion contract
- Discuss WisDOT’s database and conversion process
- Lesson Learned through the process

WisDOT's Bridge Inspection Background

- State Bridges
  - State DOT inspectors supplemented by consultants
- Local Bridges
  - Local forces and consultants
- Database developed and maintained in house
  - Allowed WisDOT to start process early

SNBI Contract Background

- Contract broken into four parts
  - Half-Day prerequisite
  - 1-Day in-person training course
  - Update WisDOT Field Manual
  - Course instruction

SNBI Contract: Field Visits

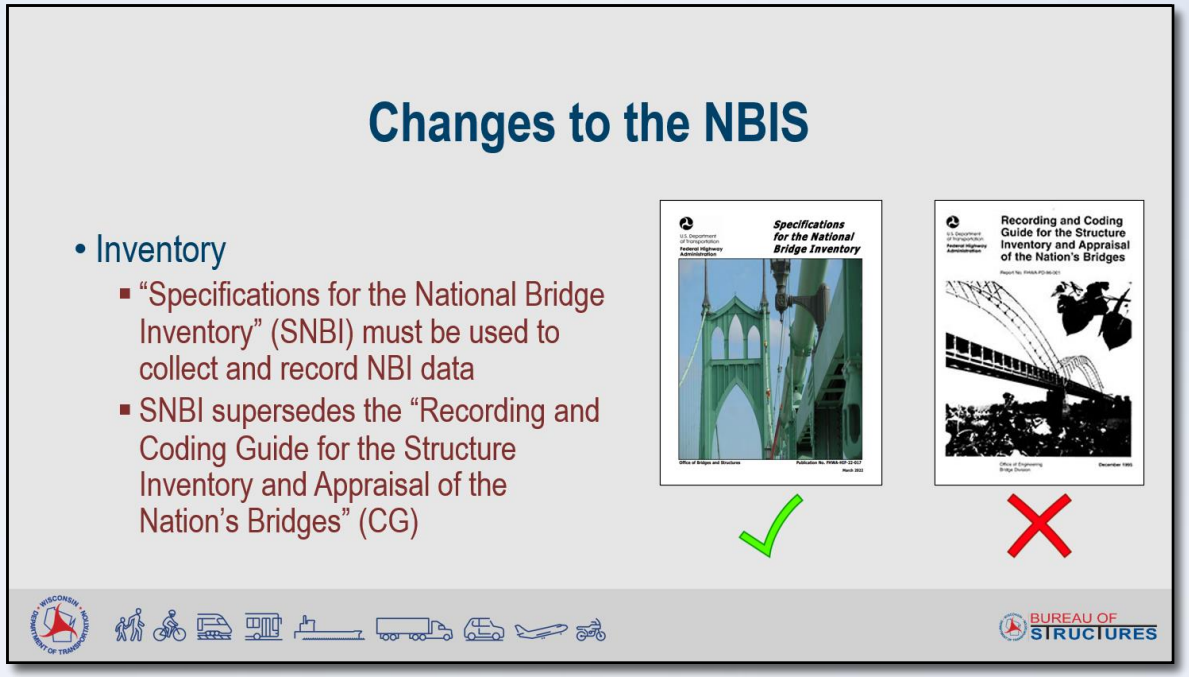
- Field visits - prior to starting class development
  - One day with WisDOT BOS and Fickett staff
    - Policy based
    - Determine areas where SNBI manual needed clarification
    - Identify conflicts with WisDOT policies

SNBI Contract: Field Visits

- Field Visits - prior to starting class development
  - One day Fickett staff only
    - Production/pace based
    - Replicate true routine inspection conditions (SNBI Only)
    - Be able to answer the questions “How much longer will this take me?”

SNBI Contract: Prerequisite

- Prerequisite objectives
  - Discuss SNBI timeline, format, many-to-one, terminology, etc.
  - Span Material and Type
  - Substructure Material and Type
  - Bridge Geometry
  - Features and Routes
  - Each Inspection Items
  - Condition Rating Changes

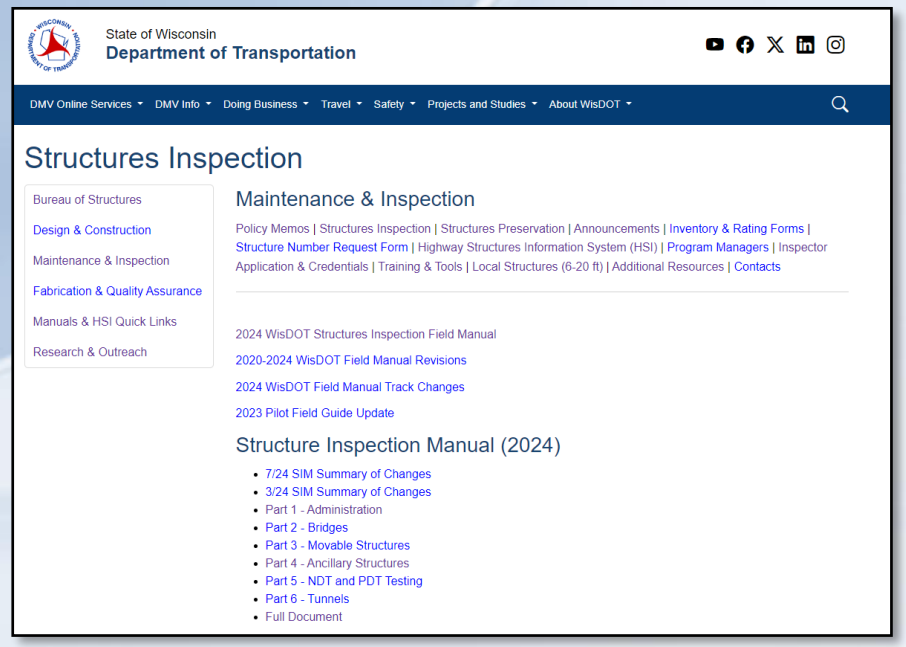


SNBI Contract: In-Person Class

- Overview of prerequisite
- SNBI inventory items: In-depth examples
  - Features, Span Material, Substructures, Roadside Hardware
- Appraisal and measurements
  - Highways, Railroad, Waterways, Insp. Req., Appraisals
- Condition ratings
- WisDOT policies
- Field Manual changes

SNBI Contract: Field Manual

- Review the major updates on the WisDOT Field Manual
- WisDOT Structure Inspection Manual

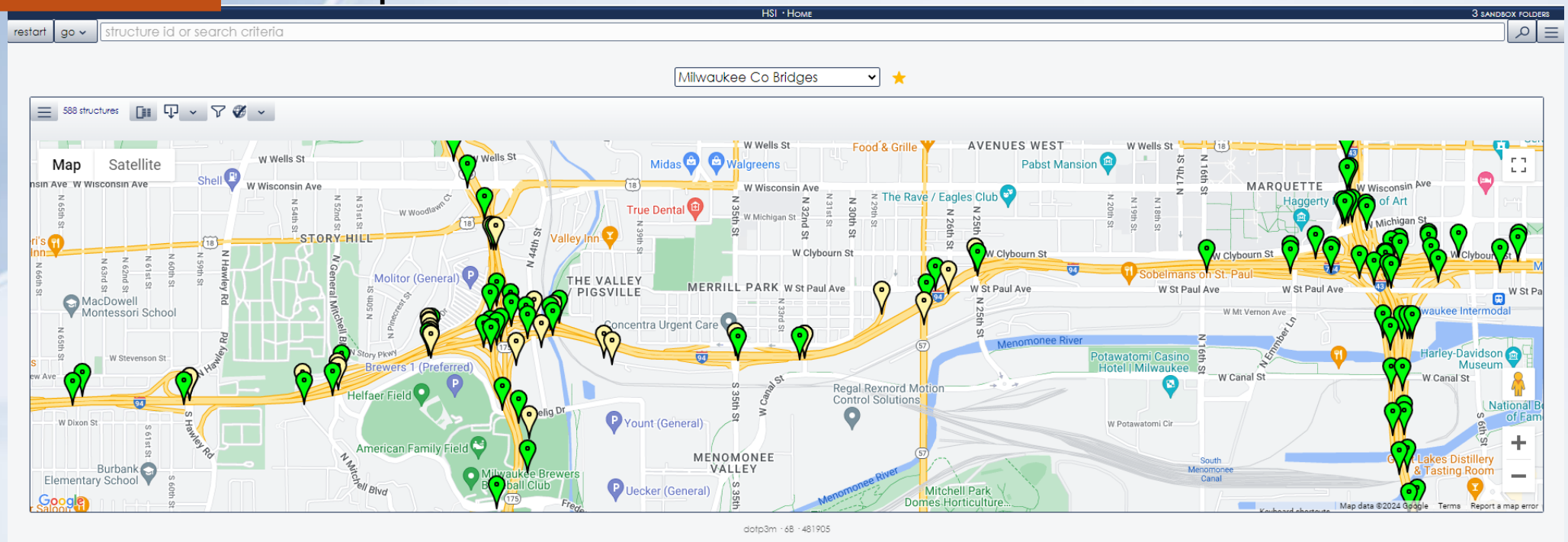


WisDOT Database Overview

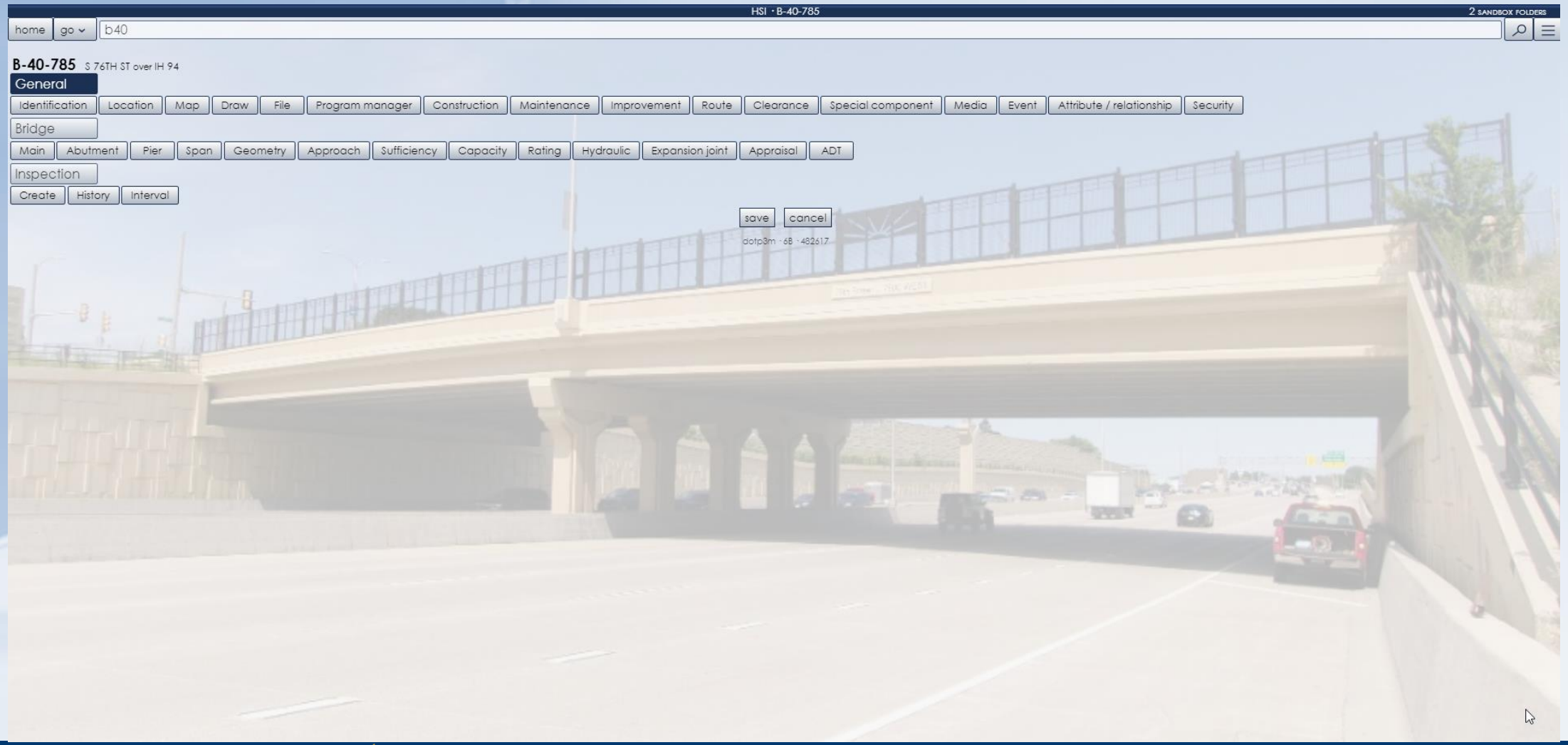
- Highway Structures Information System (HSI)
  - Early 2000's initial development
    - Imported CoRE inspections from Pontis
  - 2014 AASHTO elements
    - Similar training effort for inspectors – State and Local
  - 2015 Mobile inspection
    - Part of ongoing inspector training
  - 2016 Added ancillary structures inspection
    - Small bridges (<20' span), retaining walls, noise walls, and sign structures
  - 2021 EV ratings
    - Further integrating rating data and documentation

WisDOT Database & SNBI Conversion Process

- Highway Structures Information System (HSI)
  - Inventory and inspection data



WisDOT Database



WisDOT Database

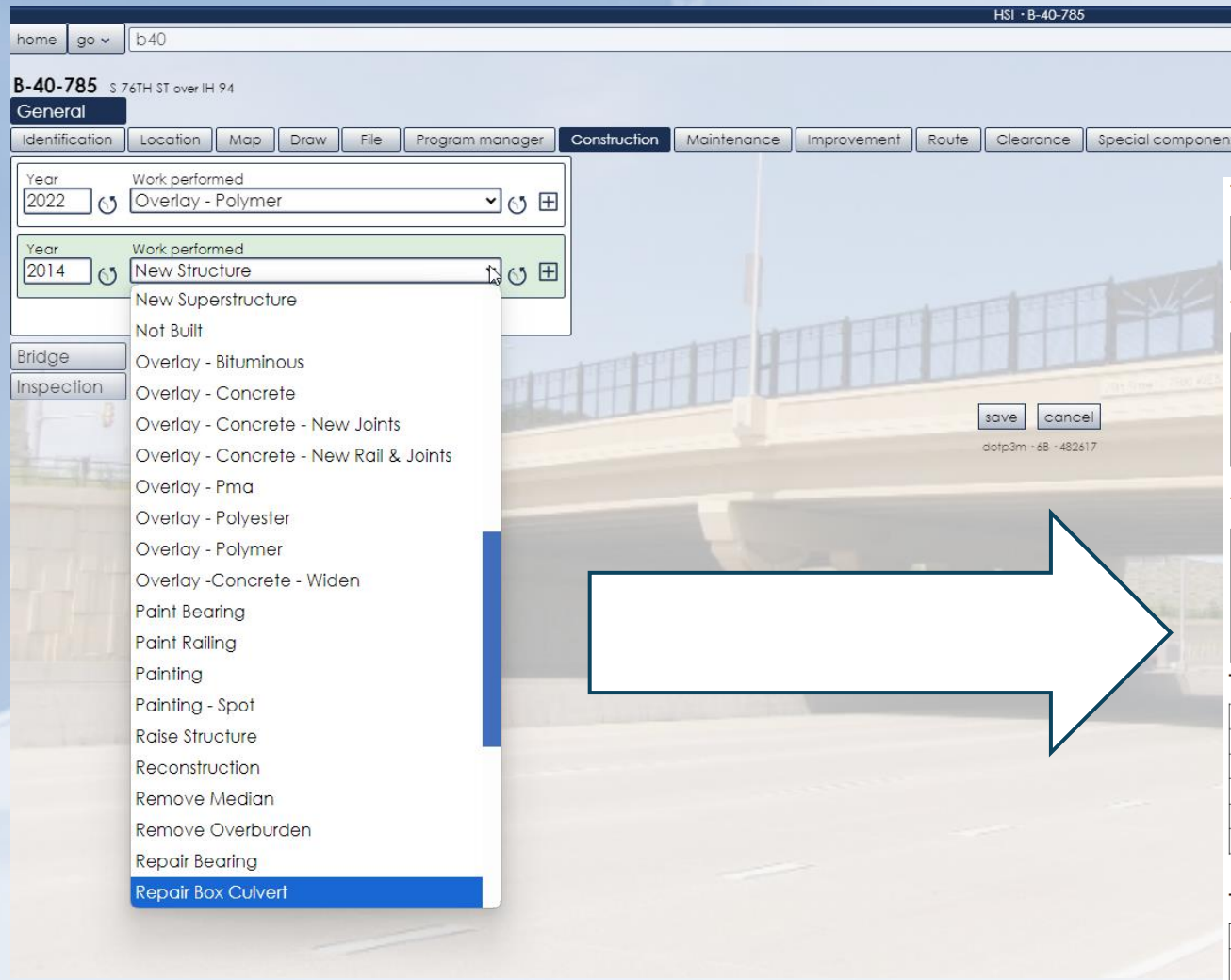


Table 29. Bridge replacement code.

Code	Description
BR1	Replaced

Table 30. Bridge improvement codes.

Code	Description
IP1	Widened
IP2	Raised
IP3	Strengthened by retrofit
IP4	Seismic retrofit

Table 31. Rehabilitation codes for deck, superstructure, substructure, and culvert.

Code				Description
Deck	Superstructure	Substructure	Culvert	
DK1	SP1	SB1		Replaced
DK2	SP2	SB2	CU2	Major Rehabilitation
DK3	SP3	SB3	CU3	Minor Rehabilitation

Table 32. Preservation codes for deck, superstructure, substructure, and culvert.

Code				Description
Deck	Superstructure	Substructure	Culvert	
DK4			CU4	Overlaid
DK5	SP5	SB5	CU5	Sealed
	SP6	SB6	CU6	Coating (New or Replaced)
	SP7	SB7	CU7	Coating (Preserved)

Table 33. Other preservation codes.

Code						Description
Bearings	Deck Joints	Bridge Railings or Transitions	Scour Counter-measures	Channel Protection	Channel	
BG1	JT1	RT1	SC1	CP1		Installed or Replaced
BG2	JT2	RT2	SC2	CP2		Repaired
					CH1	Condition Improved

WisDOT Database

HSI · B-40-785

home | go | b40

B-40-785 S 76TH ST over IH 94

General

Identification | Location | Map | Draw | File | Program manager | Construction | **Maintenance** | Improvement | Route | Clearance | Special component | Media | Event | Attribute / relationship | Security

17 item(s) filtered

Action item	Status	Complete (yr)	Status change
Approach - Wedge Shoulder/Sidewalk	Identified/recommended		06/27/2024
Misc - Remove Vegetation (Spray)	Identified/recommended		06/26/2024
Approach - Seal Approach to Paving Block	Identified/recommended		06/26/2024
Approach - Seal Joint along Parapet/Wing	Approved for Work Order Assignment		02/18/2024
Misc - Tighten Bolts and Nuts	Approved for Work Order Assignment		11/02/2022
Approach - Mud or Foam Jacking	Approved for Work Order Assignment		11/02/2022
Drainage - Repair/Replace Deck Drains/Inlets	Approved for Work Order Assignment		11/02/2022

WisDOT Database

HSI · B-40-785 2 SANDBOX FOLDERS

home go b40

B-40-785 S 76TH ST over IH 94

General

Identification | Location | Map | Draw | File | Program manager | Construction | Maintenance | Improvement | **Route** | Clearance | Special component | Media | Event | Attribute / relationship | Security

On

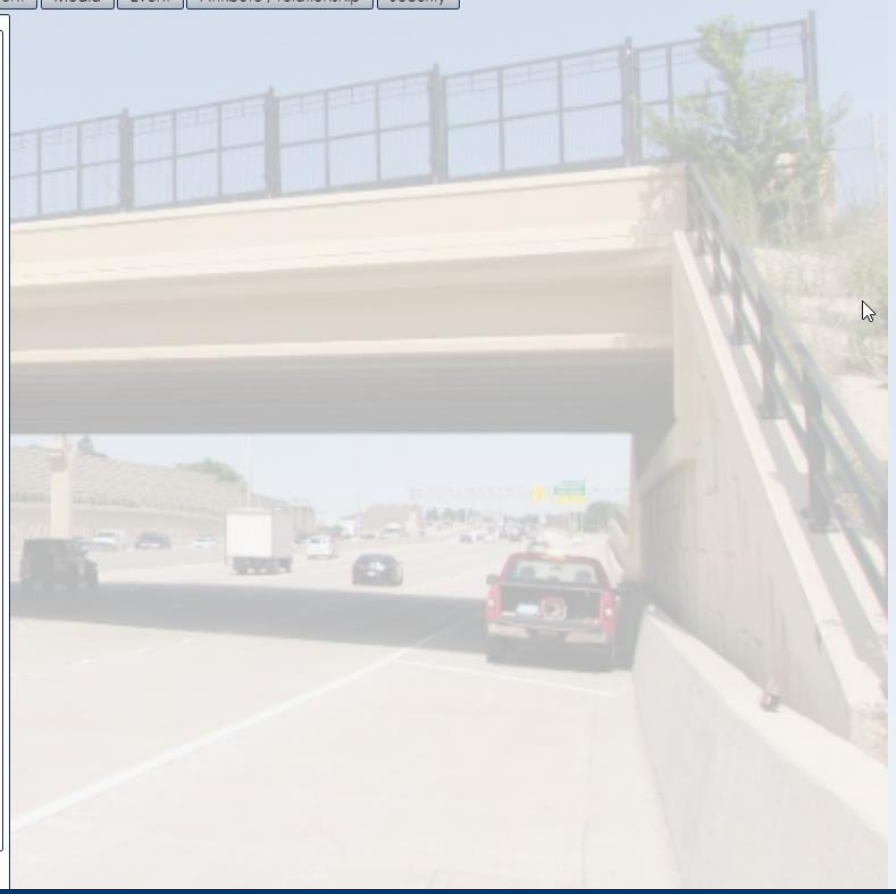
On Under
Cardinal Non-Cardinal
Primary
Local system: LRD
Route number:
Direction: North
Designation type:
Designated national network
Location: 0.5 MI S JCT USH 18
Feature name: S 76TH ST
Highway feature designation: Mainline
Highway on inventory route: Not on NHS (NON)
Strategic highway network designation: Not STRAHNET hwy (0)
delete

Under

On Under
Cardinal Non-Cardinal
Primary
Local system: IH
Route number: 94
Direction: East
Designation type:
Designated national network
Location: 0.6M E JCT STH 181 TO N
Feature name: IH 94
Highway feature designation: Mainline
Highway on inventory route: On NHI (NHI)
Strategic highway network designation: Interstate STRAHNET hwy (1)
delete

On Under
Cardinal Non-Cardinal
Primary
Local system: IH
Route number: 94
Direction: West
Designation type:
Designated national network
Location: 2.0M W JCT USH 41 TO N
Feature name: IH 94 WB
Highway feature designation: Mainline
Highway on inventory route: On NHI (NHI)
Strategic highway network designation: Interstate STRAHNET hwy (1)
delete

add



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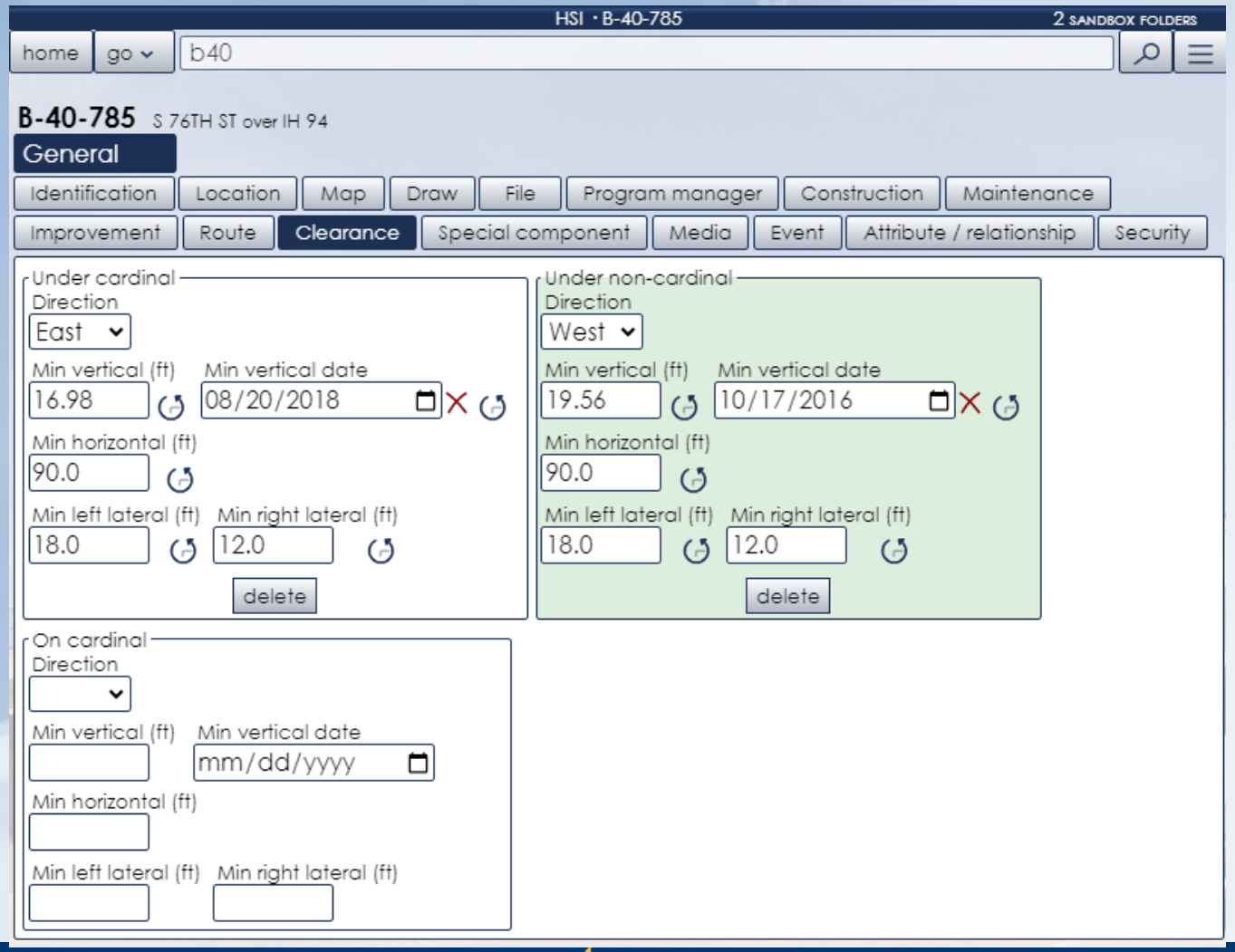

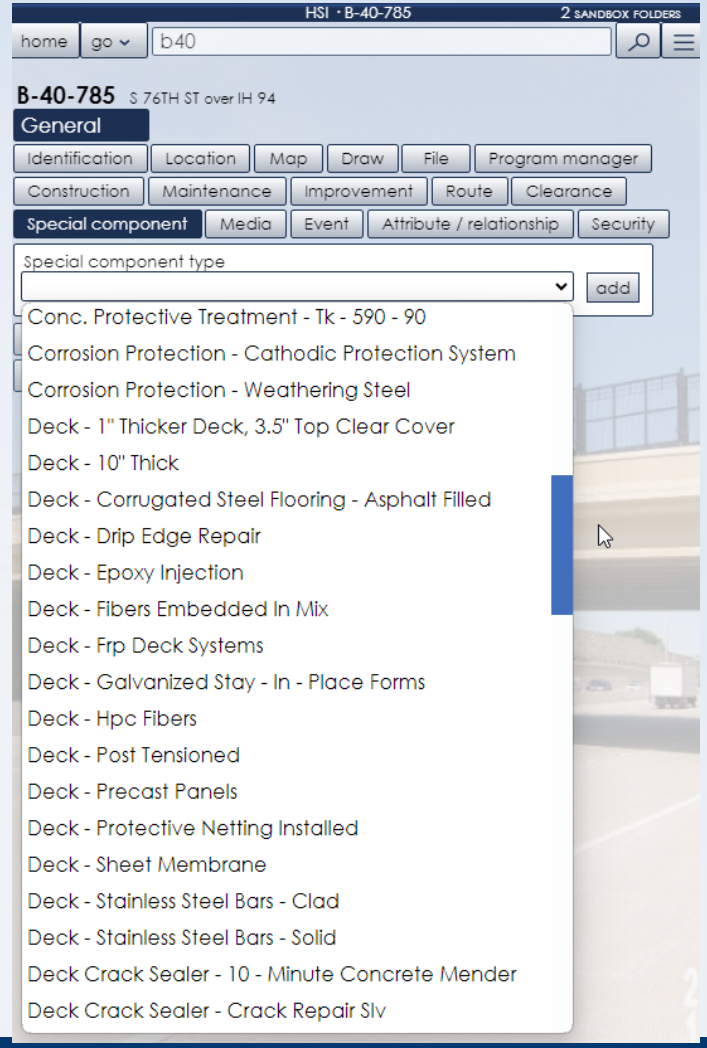

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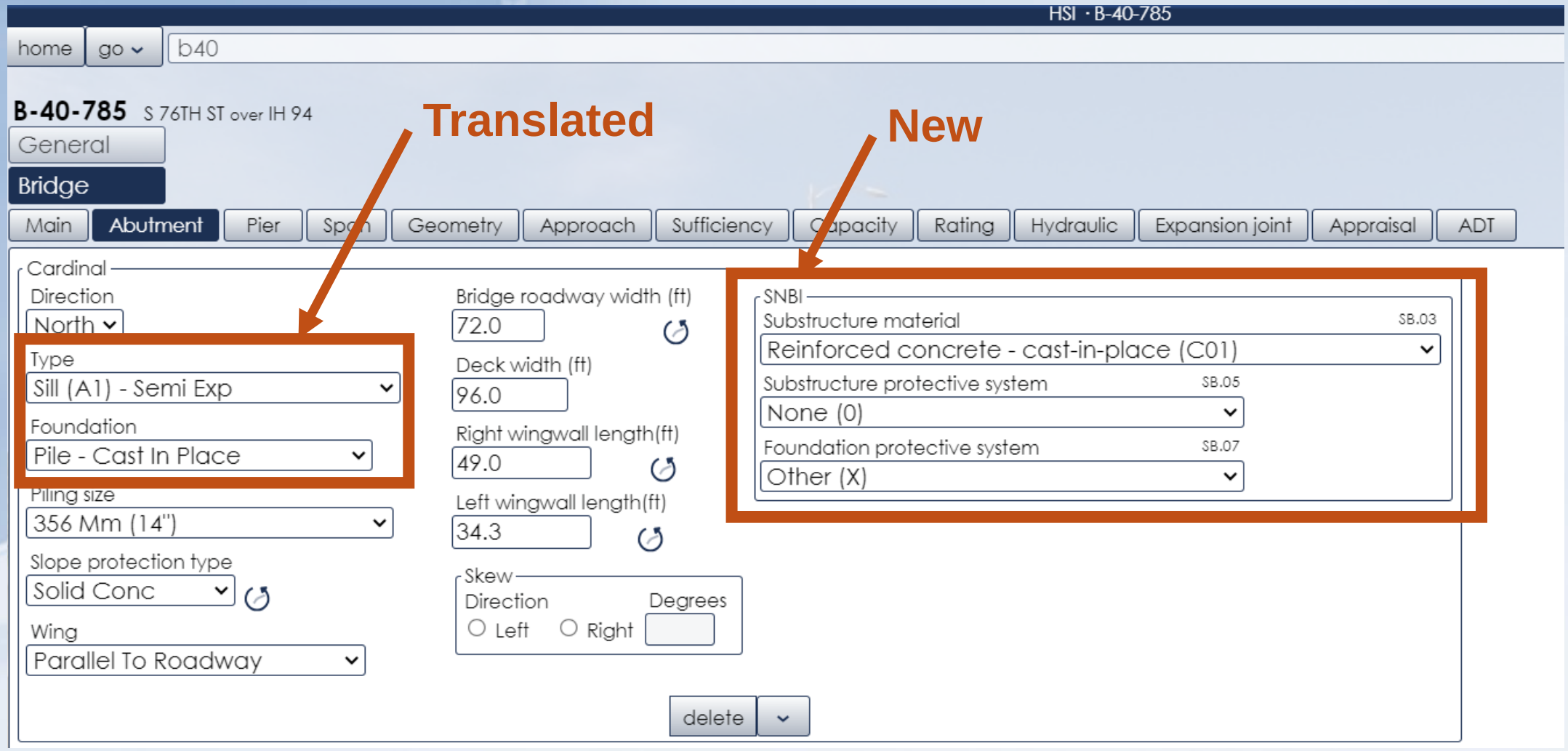

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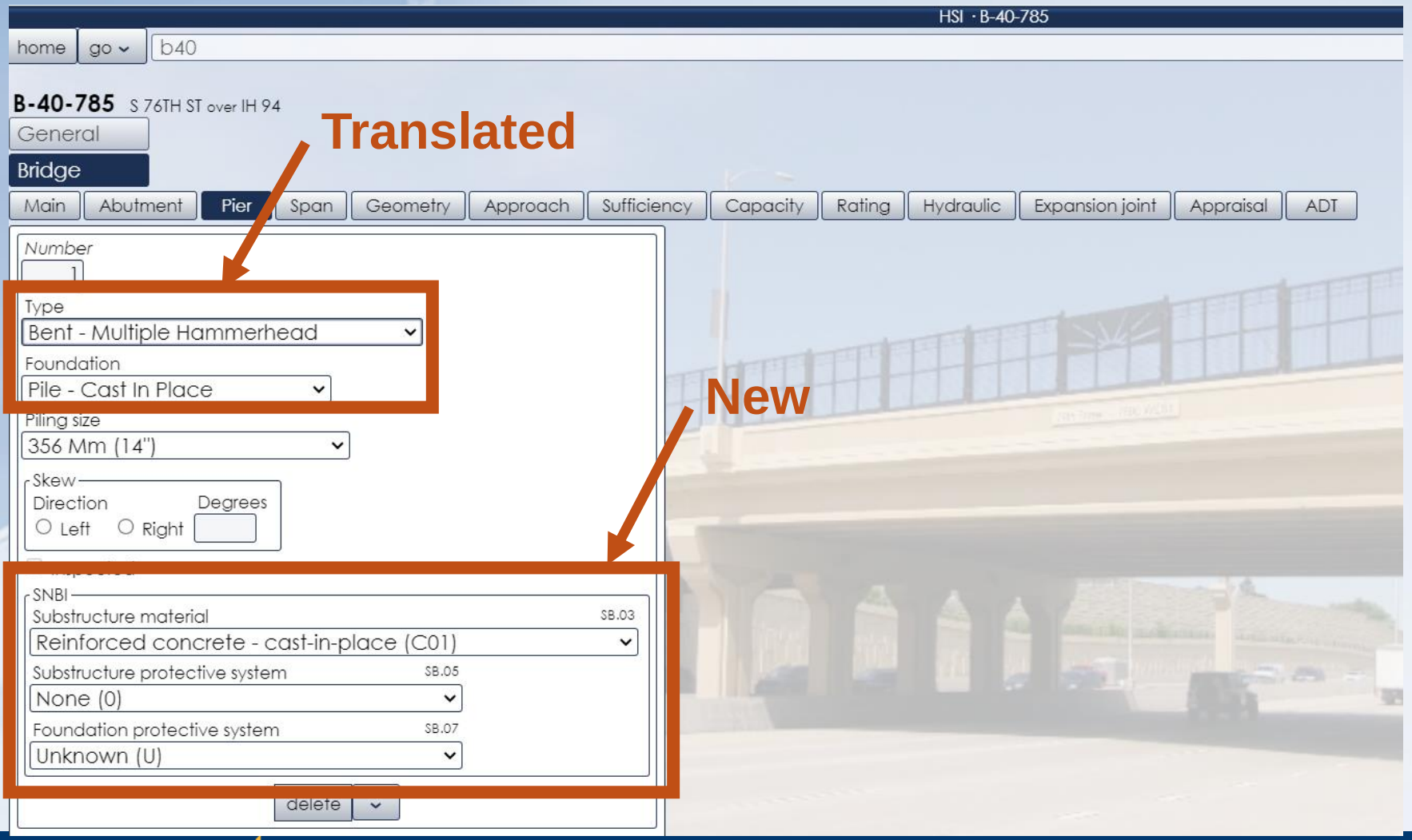

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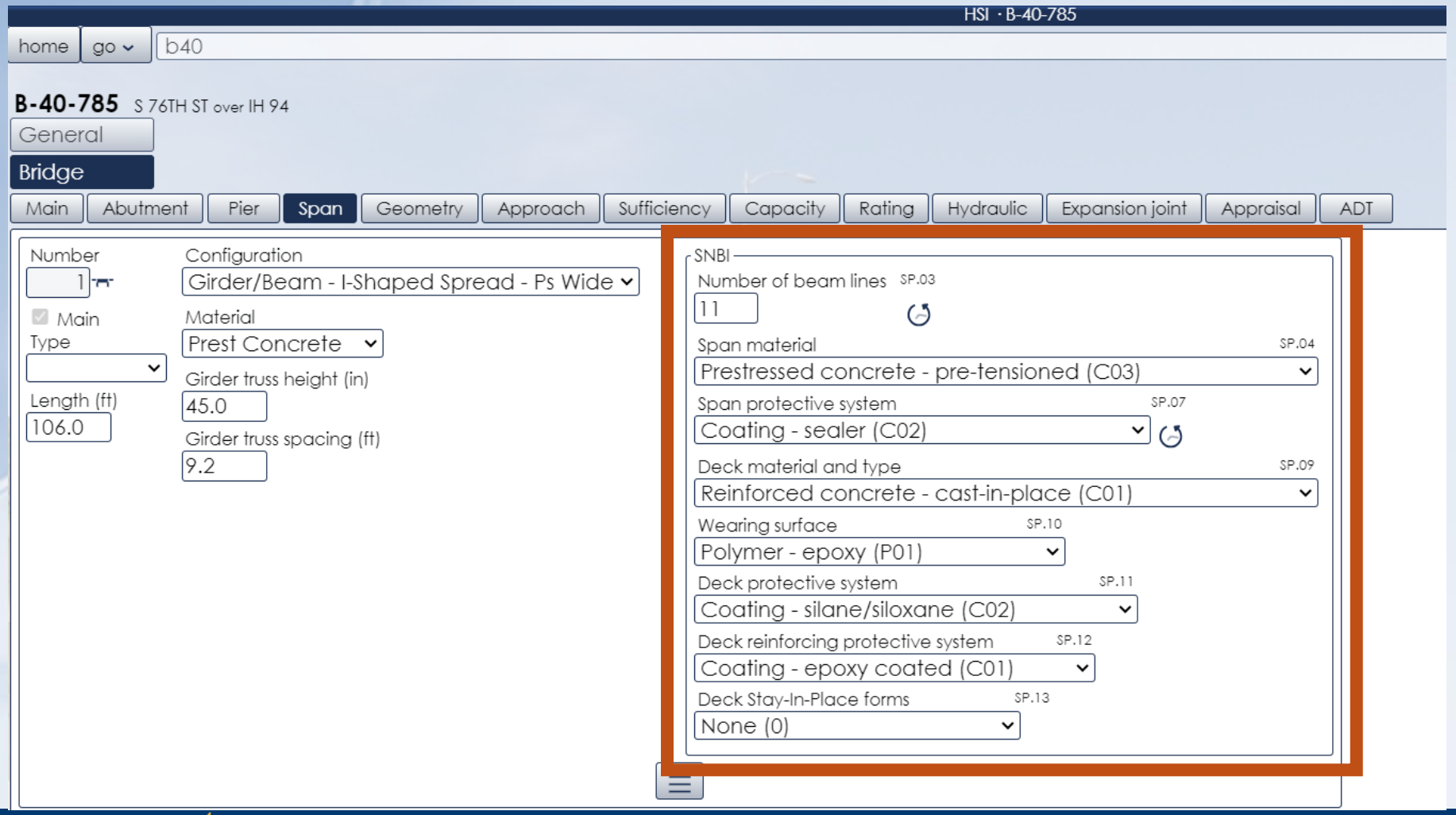

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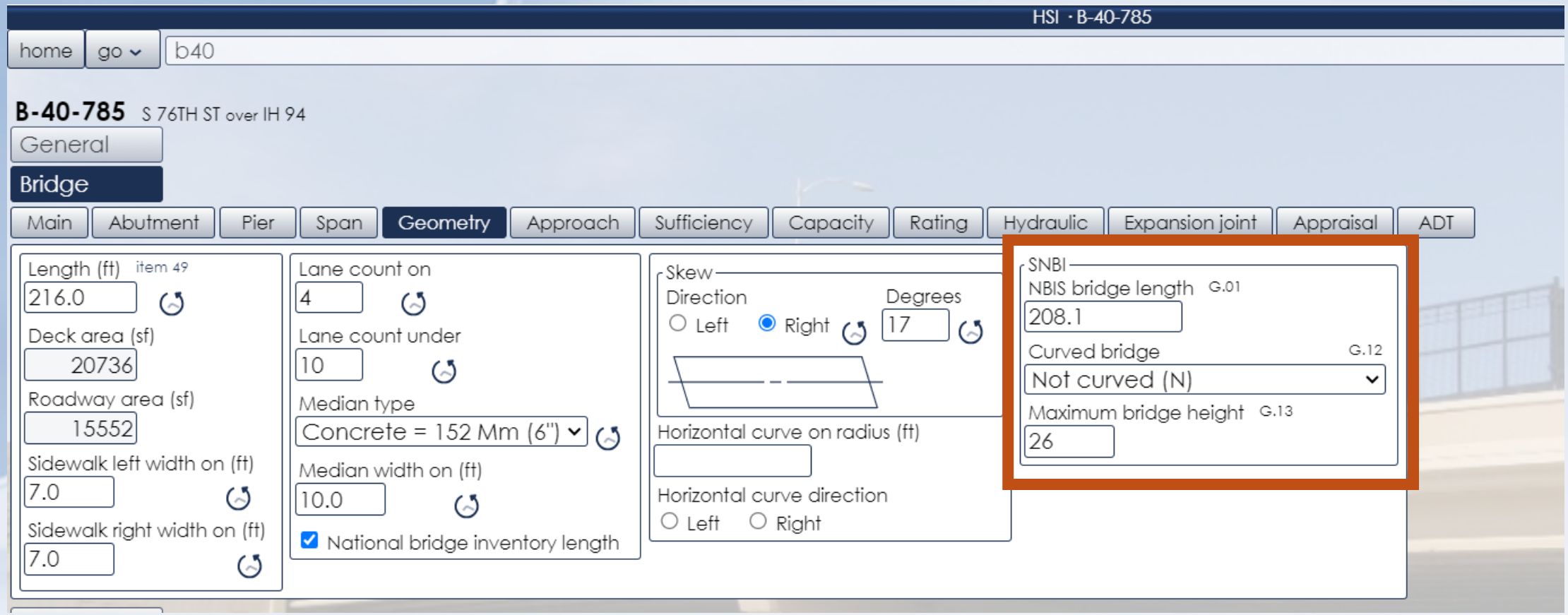

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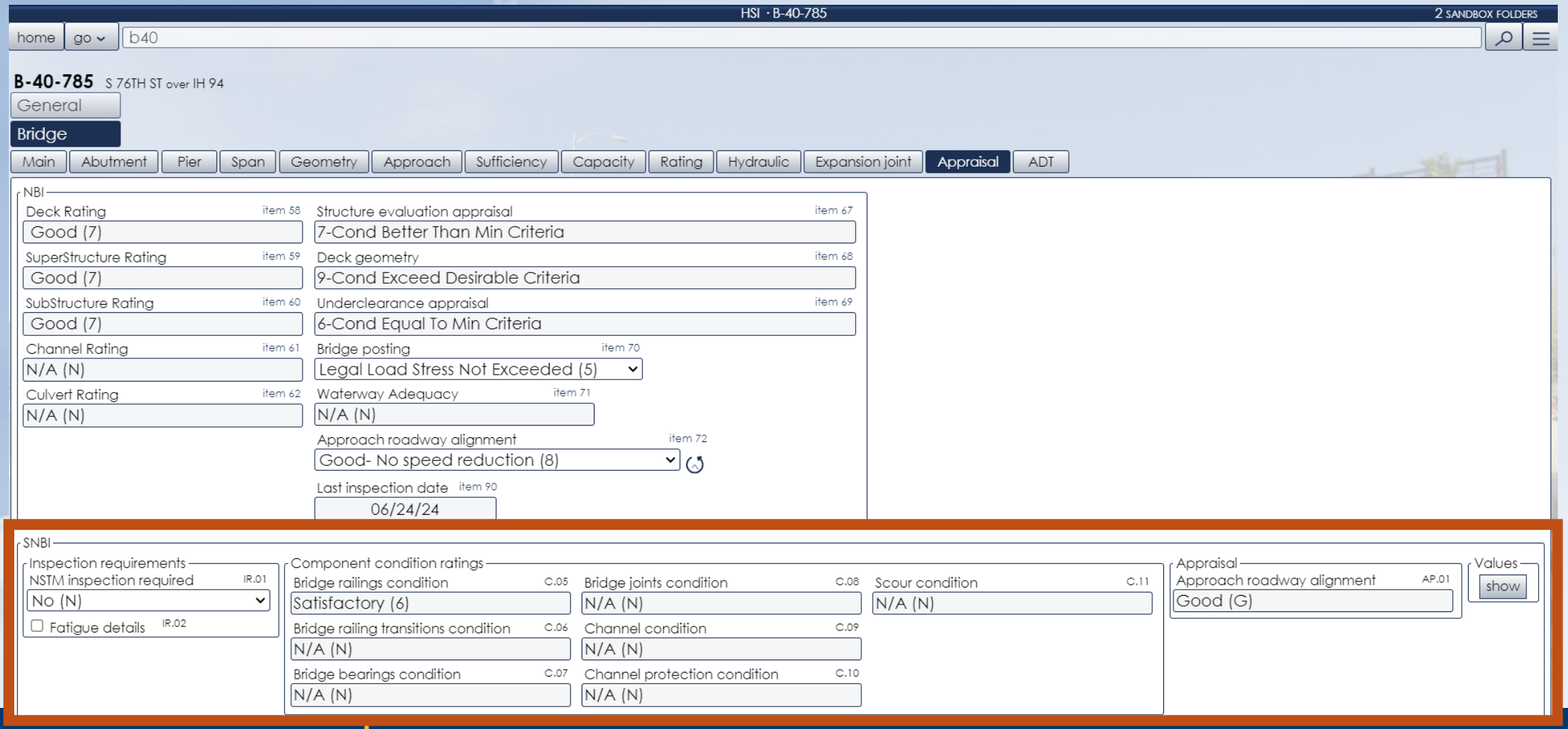
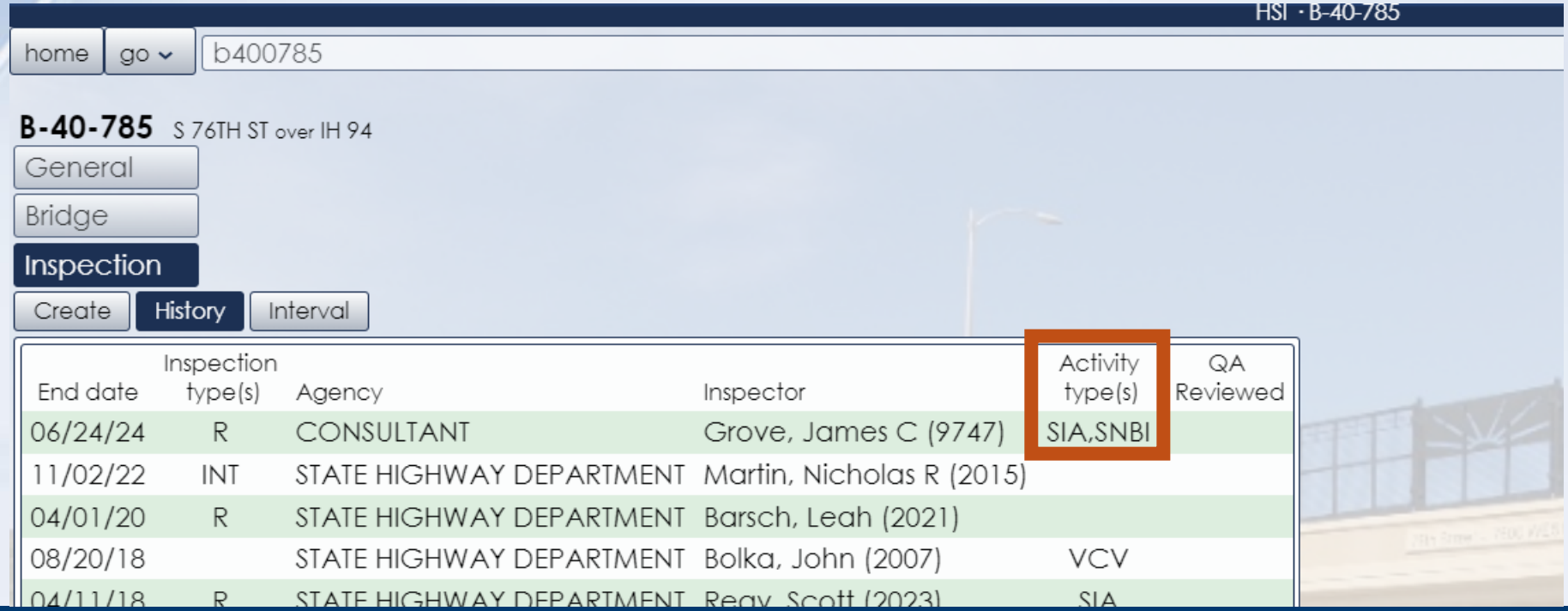


WisDOT Database

- Approximately 80% complete
- In process:
  - Roadside Hardware
  - Work Events
  - Feature ID
  - Routes
  - Load Rating

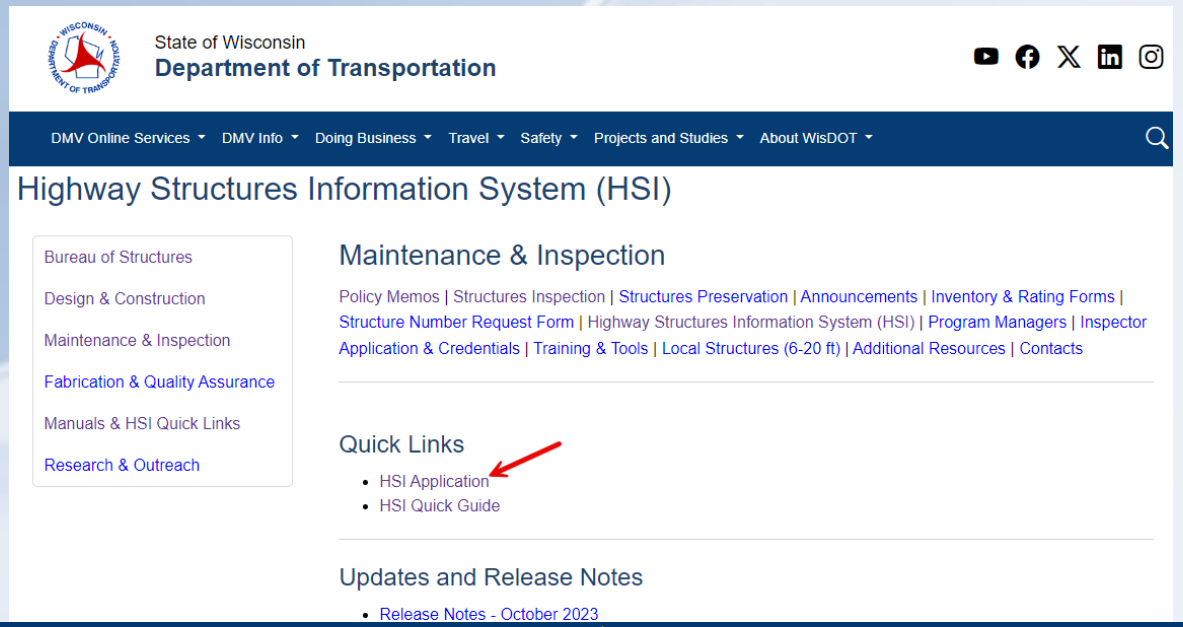
WisDOT Database

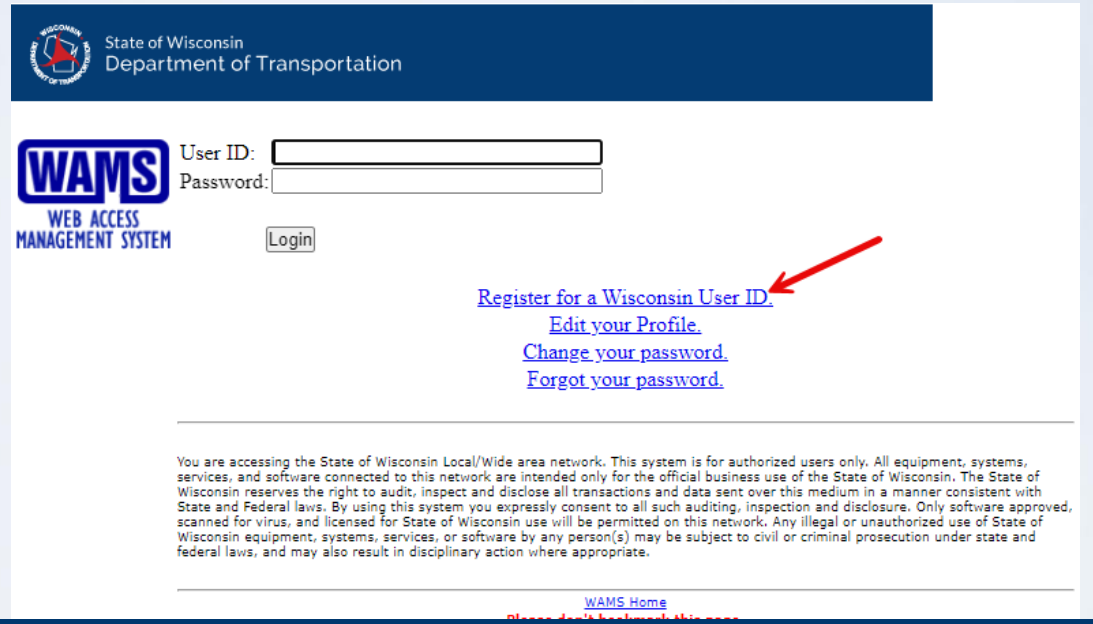
- Inspection verification
  - Tracking SNBI verification with activity type



WisDOT Database

- Highway Structures Information System (HSI)
  - Open access
    - https://wisconsindot.gov/Pages/doing-bus/eng-consultants/cnslt-rsrces/strct/hsi.aspx





SNBI Lessons Learned

- Ability to separate top wearing surface from deck/slab element
  - Default wearing surface for top of original deck (SP.10)
    - Confirmed sacrificial wearing surface in WI Bridge Manual
    - Default value is Concrete – Monolithic (C01)
  - WI ADE 8000 Wearing Surface (Bare)
  - Deck/slab element condition based on underside/side only

SNBI Lessons Learned

- Eight classes of new material = new questions
  - Inspectors, designers, state, local, consultants
- Database development team in 2nd last class
- Many “one-off” questions
- SNBI Manual ambiguity

World War II Veterans Mem Hwy
41
Google Earth
1985
44°30'33.58" N 88°04'55.73" W elev 645 ft eye alt 1532 ft

SNBI Lessons Learned

- Substructures
  - Biggest drain on field inspection staff as not currently in HSIS
  - Plan/as-built reviews
    - Done prior to mobilization

SNBI Lessons Learned – Field Inspections

- Data prep is key
- A lot of time reviewing plans
  - Typically delegated to entry engineers or interns
  - Still need supervision from experience staff to make sure coding's and unique situations are correct
- Maximum bridge height
  - (B.G.13) - Culverts

SNBI Lessons Learned – Field Inspections

- Arches vs. Culverts (B.SP.01 and B.SP.06)

B. Superstructure

- The basic purpose of the superstructure is to transfer loads from the deck across the span and to the substructure.
- The superstructure supports the deck or riding surface of the bridge, as well as the loads applied to the deck.
- Superstructure elements may be categorized by their function (truss members will transmit mainly axial loads; girders will transmit mainly shear and flexure, etc.).
- Loads may be transmitted through tension, compression, bending, or a combination of these three.
- These elements typically do not include bracing components such as diaphragms, laterals, and cross bracing.
- Prefabricated structures (CON/SPAN or similar) without a floor should be coded with the appropriate arch element. Prefabricated structures with a floor should be coded with the appropriate culvert element. In either case, prefabricated structures that retain fill to support the roadway shall use the appropriate Wall Element instead of Assessment 9248 - Culvert End Treatment. The wall element shall be quantified and evaluated from end of wingwall to end of wingwall regardless of skew or construction joints located along length.
- Elements located above the fixed/moveable bearings should be coded using superstructure elements.

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Questions?

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