



Bridge Standards

Community Planning and Transportation Committee

April 25, 2024



Agenda

- FHWA National Bridge Inspection Standards
- Inspection Process and Example
- City of Norman Inventory
- Typical bridges design in Norman
- Program update


FHWA National Bridge Inspection Standards (NBIS)

- Originally published in 1971, creating the first nationally coordinated bridge inspection program
- Requires inspection of bridges on all public roads on and off federal highways
- Sets inspection intervals for bridges and includes guidance for more rigorous risk based intervals
- Establishes inspection procedures and qualifications of the personnel performing inspections
- Standardized documentation and reporting that include load posting





Inspection process

- Oklahoma Department of Transportation (ODOT) implements and manages NBIS inventory and reporting statewide
 - Inspection consultants are vetted by the state on a biennial basis
 - Local governments select a single firm from the pool provided through state selection
 - Inspections are completed on biennial basis
 - Some bridges require more rigorous inspection cycle established by NBIS
 - Biennial report provided to the City detailing the condition and ratings
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Oklahoma Dept. of Transportation - Bridge Inspection Report

NR No.: 22300	Structure No.: 14N3100E1190002	Local ID: 002A	Dist. Rating: SS 90	NO
Bridge Description: 205. FC 6648		INSPECTION		
1. State: Oklahoma 2. Division: Division 3 3. County: CLEVELAND 4. City: NORMAN Address: Unknown 5a. On/Under: Route On Structure 5b. Kind of Hwy: City Street 5c. Lvl of Strc: Mainline 5d. Route No.: N3108 5e. Dir. Side: N/A (N/S)		7. Facility Carried: 247H AVE NW 8. Foot: LITTLE RIVER 9. S: S I S INDIAN HILLS RD 11. Mile Post: 2.883 mi 12. LRCS: / Sub Mile / 13. Elevation: 35' 17.33 35' 17. Longitude: 287' 28 28 31" 18. Border: Unknown (P) 19. Responsible: 000 20. Border Bridge#: Unknown		
STRUCTURE TYPE AND MATERIALS		CONDITION		
43ab. Main Span: PG Conc. / Stringer/Girder 44ab. Appr. Span: N/A / Not Applicable (P) 45. # of Main Spans: 1 46. # of Appr. Spans: 2 167. Deck Type: Concrete-Cast-in-Place 108a. Wearing Surface: Waffle/Rein Concrete 108b. Membrane: None 108c. Deck Protection: None		58 Deck: 7 Good 62 Culvert: N/A (N/S) 61. Chain/Chan. Prot.: 8 Protected 60. Sub a Satisfactory 63. Post: 7 Good 61. Chain/Chan. Prot.: 8 Protected		
AGE AND SERVICE		LOAD RATING AND POSTING		
18. Debitr Length: 0.0 mi 27. Year Bld: 1989 28ab. Lanes extend: 2 / 0 28. ADT: 2,000 30. Year of ADT: 2020 42ab. Type of Div extend: Highway / Waterway		31. Design Load: M 18 (H 20) 41. Post. Status: 4 Open, no restriction 70. Posting: 5 Allow Legal Loads 63. Op / 65. Inv. Rating Meth: 2 AS Allowable Stress / 2 AS Allowable Stress 84. Operating Rating (tons): 27.00 48.10 9.00 0.00 0.00 85. Inventory Rating (tons): 20.00 38.00		
GEOMETRIC DATA		APPROVAL		
10. Vert. Clearance: 89.09 ft 32. Appr Ray Width: 32.50 ft 33. Median: No median 34. Slope: 0.00 35. Struct. Paved: No Side 47 Horizontal Cr: 32.75 ft 48. Length Max Span: 83.57 ft 49. Struct. Length: 95.14 ft		37a. Brdg Rail: 1 Meets Standards 37b. Transition: 1 Meets Standards 37c. Appr Rail: 1 Meets Standards 37d. Appr Rail End: 8 Satisfactory 67. Str Evaluation: 8 Equal Min Criteria 88. Deck Geom: 5 Above Tolerable 89. Vert. Horiz. Under: Not applicable (N/A) 71. Waterway Actg: 8 Equal Decorable 72. Appr. Alignment: 7 Above Min Criteria 113. Scour Critical: 8 Stable Above Footer		
RELATIONSHIPS		PROPOSED IMPROVEMENT		
200c. Temperature: 68 200d. Weather: Clear 201. Struct. St. ASTM Comp: -1 / -1 202. Water Membrane: -1 Date Installed: 01/01/1991 203. Type Exp. Device: Other 204. Type of Rating: 76-1 205. Material Quantity: -1.00 205a. Type of Abutment: Skew/Flg 9. Type of Found.: Skew/Flg 206. Type of Pier Found.: / 210. Foundation Elev.: -1.00 -1.00 -1.00 -1.00 -1.00 -1.00 211. Wkr. Surt. Pct. Sign: None Date Installed: 01/01/1991 211c. Stone Reapplied: 211d. Date: 213. Utilities Attached:		94. Bridge Cost: \$312,000 95. Roadway Cost: \$170,000 96. Total Cost: \$495,000 97. Year Cost Est.: 2015 75. Type of Work: 31 Rep-Load Capacity 76. Length of Improvement: 126.1 ft 114. Future ADT: 2,800 115. Yr of Future ADT: 2040		
RELATIONSHIPS		RELATIONSHIPS		
214a. Posted Weight Limit: NR 9. Posted Speed Limit: 50 1. Normal/way Strg Sign: No 2. Vertical Cr. Sign: No Adv. Warning Sign: No 3. Navigation Lights: NA Working/Not Working: NA 215. Overpass: ACOD 216. Functionally Obsolete: - 220. Bridge Redded: - 221. Subst. Cond (JMS): 222. Fill Over RCB: 223. Appr. Stab/Rwy Cond.: 2 225. Paint Type/Over: 226. Date Painted: 227. Paint Color: -1 228. Deck Forming: 229. School Bus Pk.: Current bus route 240. Appr. Ray Type: Asphalt/Bituminous 243. Grt. Spring/Wr: 5.30 /		244. Open Lengths: 245. Gider Depth: 246a. Type of Overlay: NA 3. Overlay Thickness: c. Overlay Date: 01/01/1991 4. Only Depth Changed "1" 247. Protective Systems: 248. # Field Splices of Corrosion: 249. Scour-Cl. PCA Exch? No 249. Inverted: 248. Piers w/Found in COOT File: 249. Scour Elev. in COOT File: 250. Interchange of Intersection: 254. Interstate Milepost: -1.00		

Oklahoma Dept. of Transportation - Bridge Inspection Report

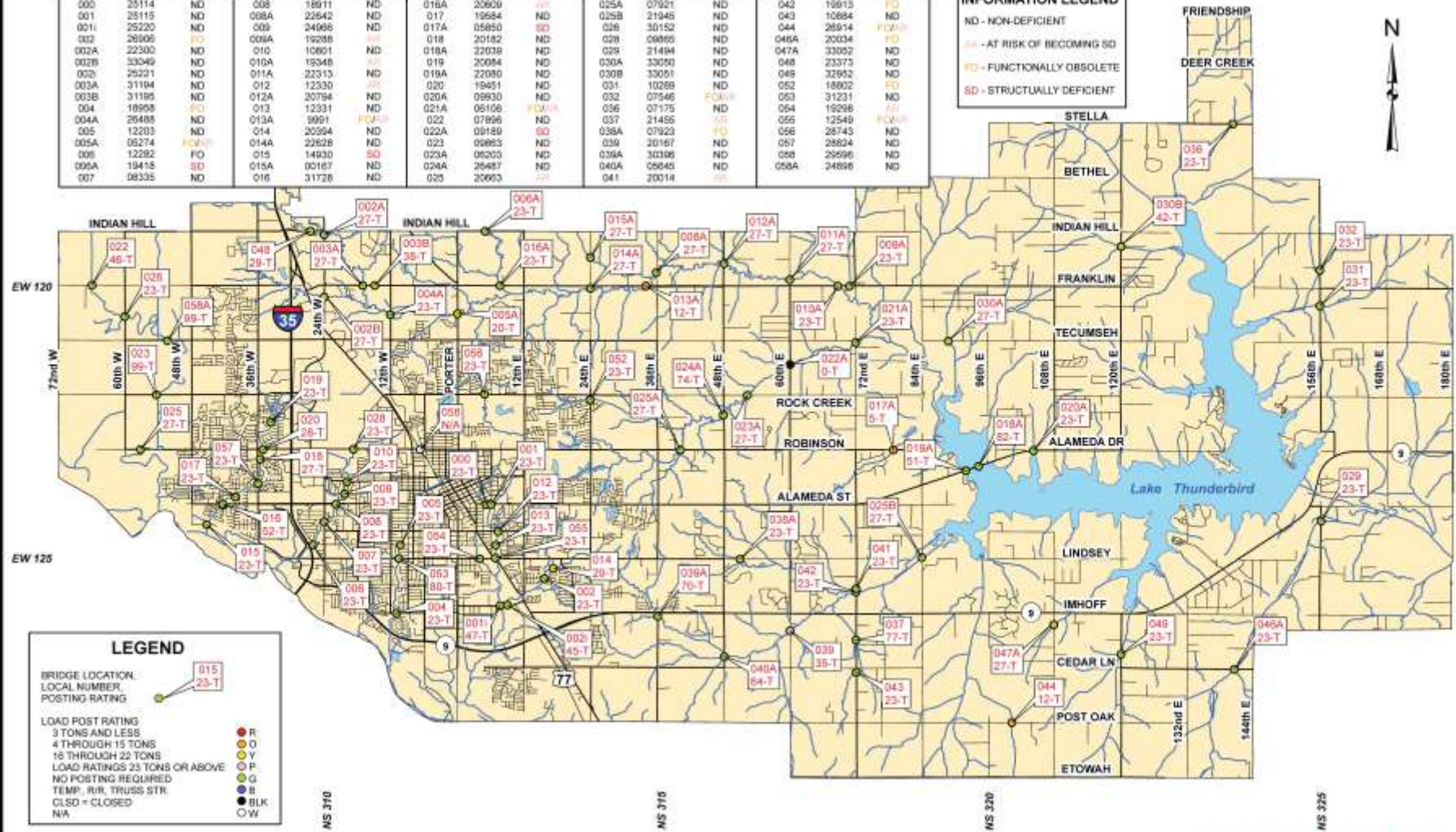
NR No.: 22300	Structure No.: 14N3100E1190002	Local ID: 002A	Dist. Rating: SS 90	NO							
Inspector Date: 10/1/2023		Inspector: Wayne Roesner		Digitally signed by Wayne Roesner (R) DN: c=US, o=Oklahoma Dept of Transportation, ou=Oklahoma Dept of Transportation, cn=Wayne Roesner (R) Date: 2023.12.13 10:22:19 -0500							
Invoice No.: 14N3141023		Inspected With: Lukas Overts									
BRIDGE NOTES:											
INSPECTION NOTES: 9810103											
Wear north bank erosion											
ELEMENT CONDITION STATE DATA											
Elem. / Eno	Description	Unit	Total Qty	% 1	Qty. 1	% 2	Qty. 2	% 3	Qty. 3	% 4	Qty. 4
12 / 4	Rc Concrete Deck	sq ft	3,940.00	100%	3,929.00	0%	11.00	0%	0.00	0%	0.00
Hairline to small diagonal & transverse cracks moderate in density present through-out. A few random moderate cracks. Wear is exposing aggregate.											
109 / 4	Pre Opn Spans-Stringer	ft	241.00	100%	241.00	0%	0.00	0%	0.00	0%	0.00
Look good											
215 / 4	Rc Conc Abutment	ft	89.00	91%	83.00	1%	1.00	7%	0.00	0%	0.00
South abutment has minor spall with exposed rebar under west beam. Hairline vertical cracks exist between beams #2 & #3. North abutment has minor spalls & cracks in bridge wall. Backfills and beams are water stained.											
362 / 4	Concrete Joint Seal	ft	28.00	83%	23.00	0%	0.00	17%	0.00	0%	0.00
Joint is filled at ends and pulling up rubber											
319 / 4	Expansion Bearing	each	9.00	0%	0.00	100%	9.00	0%	0.00	0%	0.00
FX - Exterior pads under north abutment are cracked & deteriorating. Expansion bearing on south abutment are bulging and deteriorated.											
321 / 4	Rc Conc bridge railing	ft	140.00	100%	140.00	0%	0.00	0%	0.00	0%	0.00
Hairline vertical & diagonal cracks present on both bridge rails.											
819 / 4	PG Conc. Silt Seal/SP	ft	40.00	100%	40.00	0%	0.00	0%	0.00	0%	0.00
-											
859 / 4	Crack	each	1.00	100%	1.00	0%	0.00	0%	0.00	0%	0.00
No cracking observed.											
879 / 1	Concrete Wingwall	each	4.00	100%	4.00	0%	0.00	0%	0.00	0%	0.00
Torn back wings have hairline vertical cracks.											
916 / 4	St. Bearing Assembly	each	9.00	0%	0.00	70%	6.00	20%	0.00	0%	0.00
FX - West side of and on bearing #2 on the north abutment are heavily rusted & starting to enlarge. All anchor bolts and nuts showing moderate rust.											
958 / 4	Concrete Choking Cr	each	1.00	100%	1.00	0%	0.00	0%	0.00	0%	0.00
Cracks are minor in size & density & few random moderate cracks towards north end.											

BRIDGE LOCATION INFORMATION

LOCAL NO.	NBI NO.	DEFICIENCY STATUS	LOCAL NO.	NBI NO.	DEFICIENCY STATUS	LOCAL NO.	NBI NO.	DEFICIENCY STATUS	LOCAL NO.	NBI NO.	DEFICIENCY STATUS	LOCAL NO.	NBI NO.	DEFICIENCY STATUS
000	25114	ND	008	18911	ND	018A	20909	ND	025A	07921	ND	042	19913	FO
001	25115	ND	008A	22642	ND	017	19584	ND	025B	21945	ND	043	10684	ND
001i	25220	ND	009	24068	ND	017A	05850	SD	026	30152	ND	044	26914	FO/AR
002	26906	FO	009A	19288	ND	018	20182	ND	026	08885	ND	045A	20034	FO
002A	22300	ND	010	10801	ND	018A	22039	ND	029	21494	ND	047A	33052	ND
002B	53049	ND	010A	19048	ND	019	20084	ND	030A	33050	ND	048	23373	ND
002i	25221	ND	011A	22313	ND	019A	22080	ND	030B	33051	ND	049	32952	ND
003A	31184	ND	012	12330	ND	020	19451	ND	031	10269	ND	052	18902	FO
003B	31185	ND	012A	20784	ND	020A	09930	ND	032	07946	FO/AR	053	31231	ND
004	18908	FO	013	12331	ND	021A	05106	FO/AR	036	07175	ND	054	19298	FO
004A	26485	ND	013A	9991	FO/AR	022	07896	ND	037	21455	AR	055	12549	FO/AR
005	12203	ND	014	20394	ND	022A	09189	SD	038A	07923	FO	056	28743	ND
005A	05274	FO/AR	014A	23828	ND	023	05883	ND	039	20167	ND	057	28824	ND
006	12282	FO	015	14930	SD	023A	05203	ND	039A	30306	ND	058	29596	ND
006A	19415	SD	015A	00167	ND	024A	26487	ND	040A	05645	ND	058A	24896	ND
007	08335	ND	016	31726	ND	025	20993	ND	041	20014	SD			

BRIDGE LOCATION INFORMATION LEGEND

ND - NON-DEFICIENT
 AR - AT RISK OF BECOMING SD
 FO - FUNCTIONALLY OBSOLETE
 SD - STRUCTURALLY DEFICIENT



LEGEND

BRIDGE LOCATION, LOCAL NUMBER, POSTING RATING

LOAD POST RATING
 3 TONS AND LESS: R
 4 THROUGH 15 TONS: O
 16 THROUGH 22 TONS: Y
 LOAD RATINGS 23 TONS OR ABOVE: P
 NO POSTING REQUIRED: G
 TEMP., R/R, TRUSS STR: B
 CLSD = CLOSED: BLK
 N/A: W

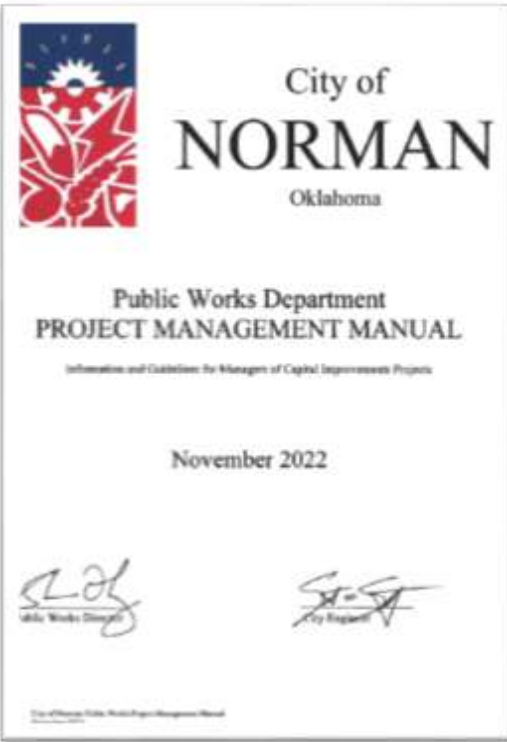
NORMAN, OKLAHOMA OFF-SYSTEM BRIDGES - DECEMBER 2023

LOCHNER

Typical Structure Design in Norman



Design Overview



- The Public Works Department has an established project management manual that sets detailed process for project planning, organization, consultant selection, design, utility coordination, construction procurement and contract administration.
- The City follows Federal and State design criteria for bridge structures.

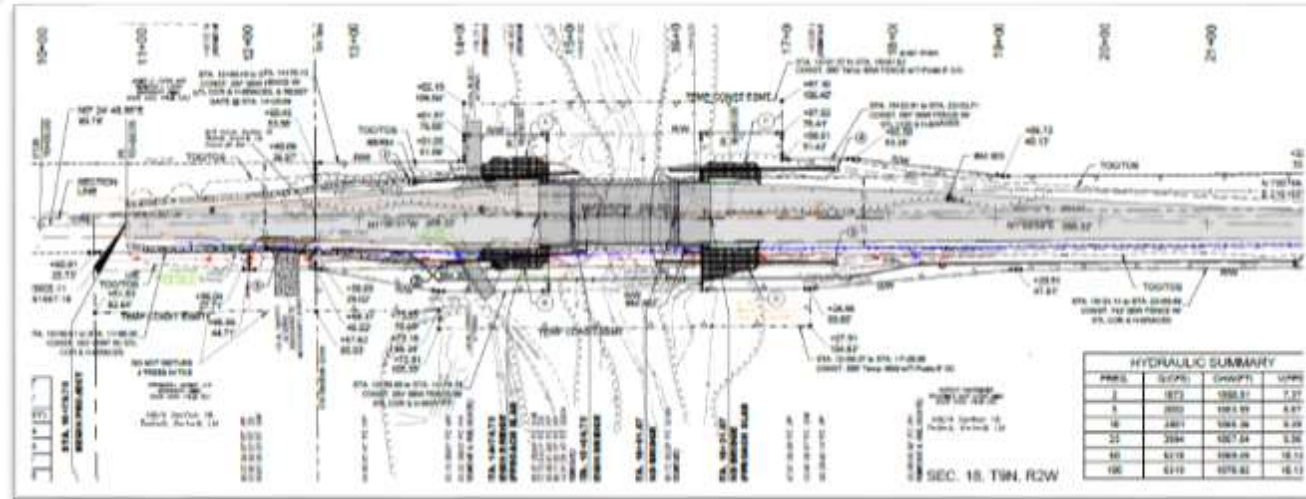


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Design Standards

- Bridge design standards and guidelines
 - Federal Highway Administration (FHWA)
 - American Association of State Highway Transportation Officials (AASHTO)
 - Oklahoma Department of Transportation (ODOT)
- Consultants are selected with adequate knowledge and expertise in structural requirements for bridges.
- All structures must meet Floodplain Regulations regarding hydraulics.
- Engineering Design Criteria
 - 5011.G “Bridges shall be designed in accordance with AASHTO/ODOT criteria.”



U.S. Department
of Transportation

**Federal Highway
Administration**



Programming Overview

CIP Bridge maintenance program

- \$1 Million dollars allocated annually for general maintenance
- Goal to perform general maintenance at all bridge locations within the next 5 years



Bridge maintenance bond program

- \$50 Million dollars
- 10 year construction cycle
- Year 1 projects shovel ready and scheduled for bid in early May
- Designs underway on upcoming projects



QUESTIONS?



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