

# Oklahoma Department of Transportation Project Initiation Report

|      | Report Date: 04/2<br>Job Piece: 34333<br>Highway: US25<br>Project Description: | 304 Div<br>9   | / County<br>9: FROM                    | -                          | 15 - MCCURT<br>DF JCT SH-3, EX                                 |                                       | -  | J3-4333(00         | 04)PM                   |
|------|--|--|--|----------------------------|--|---------------------------------------|--|--------------------|-------------------------|
|      | E: TBD<br>grammed Estimate:  |  | R/W:                                   | FFY 2026                   |  | Drive-out Da                          | ate:<br>   |                    |                         |
| EXI  |  | ATION  |  |                            |  |                                       |  |                    |                         |
| Reco | onnaisance Data Av   |  | Yes<br>http://pla                      | ansrv1.agency              | .ok.local/osd/JP3  | 3433304/PS                            | EDevelopment   | /DataReco          | nnaissance              |
| Fun  | ctional Classifica   | ation  |  |                            |  |                                       |  |                    |                         |
|      | Area Type:<br>Terrain Type:<br>Access Control:<br>Highway Type:                |  | Urban<br>Flat<br>Full<br>Freewa<br>NHS |                            | Suburban<br>Rolling<br>Partial<br>Principal Arteria<br>Non-NHS | 図<br>日<br>日<br>日<br>日                 | Rural<br>Mountainous<br>None<br>Minor Arterial<br>STRAHNET |                    | Collector<br>Scenic Hwy |
| Exis | sting Condition  |  |  |                            |  |                                       |  |                    |                         |
|      | Current ADT: 5150<br>Outside Shoulder V<br>☑ Open Sectior<br>□ Other (descr    | Vidth: No S<br>า   | hlder                                  | ucks: 14%<br>Curb & Gutter | Inside   | er of lanes:<br>Shoulder W<br>Divided | /idth:   | Lane W<br>Median W | idth: 12<br>idth:       |
|      | Pavement Type:<br>Shoulder Type:<br>Storm Sewer<br>Sidewalks                   | Asph<br>Asph<br>☑ No<br>☑ No   |  | Yes<br>Yes L               | S  |                                       | ndition: Fair<br>ndition: Fair<br>ndition:                 | Right W            | idth:                   |
| Bric | <b>Iges within the P</b> ı<br>NBI 14031  | I - 3 cell 10x5  | 5x59' RC                               | E ATTACHE                  | leficient.   | I REPORT                              | S  |                    |                         |
| CO   | SIDERATIONS  |  |  |                            |  |                                       |  |                    |                         |
| Env  | ironmental   |  |  |                            |  |                                       |  |                    |                         |
| Ø    | Cemeteries, list<br>Hochatown  | Cemetery, re   | efer to re                             | econ report for            | location   |                                       |  |                    |                         |
| Ø    | Hazardous Waste  |  | / Coal N                               |                            |  |                                       |  |                    |                         |
| V    | Threatened & Enda  |  | cies, list                             | t with seasor              | al restrictions  |                                       |  |                    |                         |
| Ø    | Aquatic Species, li  | ist with seas  | onal res                               | strictions                 |  |                                       |  |                    |                         |
|      | Wetlands, list<br>Refer to Da<br>Indian / Tribal / Feo                         | ta Recon Rej<br>ta Recon Rej<br><b>deral / Wetla</b><br>ta Recon Rej | oort<br>n <b>d Rese</b> i              | erve Program               | list   |                                       |  |                    |                         |

| Report Date: 04/27/20 | 21               |                              |             |                |
|-----------------------|------------------|------------------------------|-------------|----------------|
| Job Piece: 3433304    | Div / County:    | 02 / 45 - MCCURTAIN          | Project ID: | J3-4333(004)PM |
| Highway: US259        |                  |                              |             |                |
| Project Description:  | US-259: FROM 6.2 | 25 MI N. OF JCT SH-3, EXTEND | N. 6.00 MI  |                |

#### Alternative Impacts

☑ Other agencies / entities □ Turnpike Involvement Metropolitan Planning Organization U.S. Forest Service, Choctaw Nation of Oklahoma, Kiamichi Economic Development District of Oklahoma (KEDDO), McCurtain County Commissioner District #3, City of Broken Bow **Right of Way / Utilities**  $\mathbf{\nabla}$ Additional Right of Way anticipated, list TBD  $\square$ Utility Conflicts, list three overhead electric transmission lines, three water lines, a sanitary sewer line, two telephone lines, and one natural gas distribution line **Permit Information Design Exception Anticipated:** Maintenance Agreements (Lighting, Signals,...), list

| Permits Required: | D FAA | I USACE | □ OWRB | Railroad | Other |
|-------------------|-------|---------|--------|----------|-------|
| 404 Permit - TBD  |       |         |        |          |       |

\_ \_\_\_ \_\_ \_\_ \_

Additional Permit Comments:

#### **Special Considerations:**

Ouachita National Forest, including the Forest office and tribal property

# **PROPOSED IMPROVEMENTS**

## **Project Intent:**

To improve the safety and operation of the highway.

**Description of Proposed Improvements:** 

The general scope of this project is to improve US-259 to meet the current and future needs for the area. This project will incorporate the following items:

- o Preliminary engineering to develop concepts for the selection of a preferred alternative.
- o Coordination with the advisory committee as representatives of the public and stakeholders.
- Development of construction plans for the preferred alternative that will culminate in a PS&E deliverable.
- Potential development of construction plans that will culminate in a PS&E deliverable to make interim improvements at the intersections of SH-259A (South) and Stevens Gap Road that will work with the selected alternative.

Intersection signal plans are currently being developed by Traffic Division for the US-259 & US-259A (North) intersection.

New Bridge Info: NBI 14031 - 3 cell 10x5x59' RCB will need to be extended with any road widening.

Design Speed: Desired:

Minimum:

| Potential to transfer Steel Beams to County: |  | Yes | 🗆 No | $\checkmark$ | N/A |
|--|--|-----|------|--------------|-----|
|--|--|-----|------|--------------|-----|

#### **Project Termini**

Beginning of Project: Approx. 6.25 mi north of Jct SH-3

End of Project: approx. 12.0 mi north of Jct. SH-3 (Golf Course Road)

Limits of Survey: US 259 -

Start: At W. 5th Street in Broken Bow End: At a point approx. 1000' north of Golf Course Road (Approx. 12 miles) Width: 200' Left and Right of US-259 (100' Lt & Rt between 5th and 11th)

Intersecting Roads – Sherry Lane: Extend 1000' east and west of US 259 (100' Lt & Rt) US 259A South: Extend 1000' east of US 259 (100' Lt & Rt) Stevens Gap Rd.: Extend 1000' east of US 259 (100' Lt & Rt)

Survey being done by ODOT.

Limits of NEPA: Study footprint determined by designer and provided to EPD

### **Typical Section**

| <ul><li>☐ Open Section</li><li>☑ Other TBD</li></ul> |     | Curb & Gutter<br>eliminary engineer |              | ided          | Median Width:     |
|--|-----|-------------------------------------|--------------|---------------|-------------------|
| Number of lanes: TBD<br>Outside Shoulder Width:      | TBD |                                     |              | oulder Width: |                   |
| Storm Sewer:   | No  | (only if needed in                  | C&G section) | □ Yes         |                   |
| Sidewalks: 🗹   | No  | □ Yes                               |              |               |                   |
| Overlay:   | No  | 🗹 Yes                               | Thickness:   | Determined b  | y pavement design |
| Coldmill:  | No  | 🗹 Yes                               | Thickness:   | Determined b  | y pavement design |

| Report Date: 04/27/2021<br>Job Piece: 3433304<br>Highway: US259<br>Project Description: US   | Div / County:<br>3-259: FROM 6.2   |  | CCURTAIN<br>H-3, EXTEND N. 6.C | Project ID: J3-4333(004)PM<br>00 MI  |  |
|--|------------------------------------|--|--------------------------------|--|--|
| Add Shoulders   No Bridge Width:   | ☑ Yes                              | s Width:   | TBD as part of d               | esign  |  |
| Alignment  |                                    |  |                                |  |  |
| <ul> <li>Existing</li> <li>New, located</li> <li>Parallel lanes, located</li> <li>Decision comments:</li> <li>Spot Improvements</li> <li>Horizontal, Description:</li> <li>Vertical, Description:</li> </ul>                         | □ North<br>□ North                 | □ South<br>□ South   | □ East<br>□ East               | <ul><li>West of existing</li><li>West of existing</li></ul>  |  |
| Detour   |                                    |  |                                |  |  |
| <ul> <li>Shoo-fly, located</li> <li>Widening, located</li> <li>Crossovers</li> <li>Close Road</li> <li>Signed Detour, Route D<br/>Anticipated Duration of</li> <li>Agreement Required for</li> <li>Phased Construction, D</li> </ul> | Detour:<br>r Detour<br>esc: Road w | South South remain open during to properties.  | ☐ East<br>☐ East               | <ul> <li>West of existing</li> <li>West of existing</li> <li>g phased construction and maintain</li> </ul> |  |
| Aesthetics   |                                    |  |                                |  |  |
| 🗆 Yes 🗹 No   |                                    |  |                                |  |  |
| Traffic Items  |                                    |  |                                |  |  |
| Traffic Management Plan  | ⊠ No                               | □ Yes  |                                |  |  |
| Median Barrier   | ⊠ No                               | □ Yes  |                                |  |  |
| New Guardrail  | ⊠ No                               | □ Yes  |                                |  |  |
| End Treatment  | ⊠ No<br>⊠ No                       | □ Yes, Type:<br>□ Yes  | Outside                        | □ Median   |  |
| Highway Lighting<br>Traffic Signals  |                                    |  |                                | South) and Stevens Gap Road  |  |
| Miscellaneous  |                                    |  |                                |  |  |
| Channel Work<br>Public Involvement   | ☑ No<br>□ No                       | <ul> <li>Relocation</li> <li>Road Closu</li> <li>Public Meet</li> <li>Stakeholder</li> </ul> | ing                            | ment 🛛 Cleanup   |  |

# **PROGRAMMING INFORMATION**

| RW Project Needed      | No | $\checkmark$ | Yes |
|------------------------|----|--------------|-----|
| Utility Project Needed | No | $\checkmark$ | Yes |

#### Initiation Estimate

Roadway: Bridge: Traffic Control: Signing and Striping: Highway Lighting: Traffic Signals: Mobilization: Staking: E & C: Total Construction:

Right of Way: Utilities:

Total Estimate:

#### Comments:

Approx. \$30 mil

### **Program Revisions**

Estimate: Letting Date: / Project Length: Work Type: Description:

#### Attendees

Report Author: David Saulsberry

# McCurtain County, JP 34333(04) – US-259 – Begin at W. 9<sup>th</sup> Street in Broken Bow, Extend North Approximately 12.5 Miles CI-2141E Task Order 2

Reconnaissance Data Collection Executive Summary

Reconnaissance data collection was performed for the US-259 corridor beginning at W. 9<sup>th</sup> Street in Broken Bow and extending north approximately 12.5 miles in McCurtain County, Oklahoma. The data collection area included 250 feet on each side of the existing US-259. The data collection area consists primarily of undeveloped wooded land, roadway, as well as the north section of the City of Broken Bow and the small lake community of Hochatown. There are three bridges within the project area (NBIs 13819, 13820, and 14031).

This Reconnaissance Data Collection report identified several constraints in the project corridor. There are six federal properties within or immediately adjacent to the project area associated with the U.S. Forest Service, Ouachita National Forest, including the Forest office. There are three tribal fee parcels and three tribal trust parcels within the study area. All are owned or held in trust for the Choctaw Nation of Oklahoma. Utilities in the project area include three overhead electric transmission lines, three water lines, a sanitary sewer line, two telephone lines, and one natural gas distribution line. There are twenty-seven regulated trade fixtures in the project area. There are no airports, cemeteries, wildlife or waterfowl refuges, military properties, or significant cultural resources.

There are twenty-eight hazardous waste sites within or adjacent to the project area. These sites include twenty-five UST, AST, LUST and LAST sites. Based on the OCC Oil and Gas Division well database, no wells are located within the project area or within 1/8 mile of the project area. There are no water wells located within the project area; however, ten ground water wells are located adjacent to the project area.

Natural resources in the project area include several stream crossings and potential wetlands. Drainage in the project area generally flows to the south to the Little River. The project area is located within two federally listed aquatic dependent species watersheds, Little River (Rabbitsfoot, Ouachita Rock Pocketbook, Scaleshell Mussel, and Winged Mapleleaf) and Mountain Fork Rivers and its tributaries (Leopard Darter). The FEMA floodplain maps indicate no Zone AE floodplains occurring within the project area. Multiple streams and wetlands were observed during the site visit.

Threatened and endangered species in the area include the species mentioned as well as the Northern Long-Eared Bat, Piping Plover, Red Knot, Red-cockaded Woodpecker, American Alligator, American Burying Beetle, and Harperella. Depending on what specific habitat is identified in the proposed project area, certain species may require pre-construction surveys or seasonal restrictions on tree clearing and construction.

Census data collected for the project area show Block Groups within Broken Bow at the southern end of the project area have a lower median household income and a higher percentage of families living below the poverty line than the County and the State. In addition, this southern end has a higher concentration of minority populations than the County and the State. The Native American population percentage is higher in all Block Groups (excluding Block Group 1 in Census Tract 985) that the County and State percentages.

# Oklahoma Dept. of Transportation - Bridge Inspection Report

| <u>NBI No.:</u>   | Structure                               |  | ocal ID:   |                | Suff. R                         |   | ND   |
|---|---|--|--|----------------|---------------------------------|---|--|
| 14031   | 4516 09                                 | IJ Ā   | 53   |                |                                 | 1.10  |  |
| Bridge Description:         IDENT           (3) 10ft. X 5ft. X 59ft. LONG RCB | <u>TIFICATION</u>                       |  | NBI:   | p. Req. Ins    | p. Done F                       | ECTION<br>Freq. Insp. Date<br>months 7/2/2019<br>NA |  |
| 1. State: Oklahoma 7. Fa  | acility Carried : U.                    |  | FC:<br>UW:   | Ν              | 0<br>0<br>0                     | NA  | NA   |
| 2. Division: Division 2 6. Fe<br>3. County: MCCURTAIN                         | eat. Intersect: CRI<br>9. Location: 9.1 |  | OS:  | N              | -                               |   | NA   |
| 4. City: Unknown  | 11. Mile Post:                          | 9.128 mi                                       |  |                |                                 | FICATION  | de ll hetdere er tete                      |
| Admin Area: Unknown   |   | Sub Rte: 4516 0000 / 03                        | 12.Base Hwy N  |                |                                 |   | No    bridge exists                        |
| 5a. On/Under: Route On Structure  | 16. Latitude:                           | 34° 09' 23.16"                                 | 20. Toll Facility:   |                | oad                             |   | 2-way traffic<br>Not Applicable (P)        |
| 5b. Kind of Hwy: U.S. Hwy   | 17. Longitude:                          | 094° 45' 13.44"                                | 21. Custodian:<br>22. Owner:   | State          |                                 |   | On the NHS                                 |
| 5c. Lvl of Srvc: Mainline   | 98. Border Brdg:                        | Unknown (P)                                    |  |                | Other Princ                     | 105. Fed Land Hwy: N                                |  |
| 5d. Route No.: 00259  | % Responsible:                          |  | 37. Historical Si  |                |                                 | 110. Defense Hwy: N                                 |  |
| 5e. Dir. Sufx: N/A (NBI)  | 99. Border Brdg                         | #: Unknown                                     | 100. Def. Hwv:   |                |                                 | 112. NBIS Length: L                                 |  |
|   | PE AND MATERI                           |  |  |                |                                 | DITION  |  |
| 43a/b. Main Span:   | Concrete / Cu                           |  | 58.Deck: N/A   | (NBI)          | 59.Sup.: N I                    | N/A (NBI) 60.Sut                                    | o:N N/A (NBI)                              |
| 44a/b. Appr. Span:  | Unknown / Ur                            | iknown (P)                                     | 62.Culvert: 8 N  | No Major Prot  | 61.Chan./C                      | han. Prot.: 6 Bank S                                | lumping                                    |
| 45. # of Main Spans: 3  |   |  | Flowline Note  | es             |                                 |   |  |
| 46. # of Appr. Spans: 0   |   |  | [2011] Profile b   | begins at SE c | orner, measu                    | ured from top of floor                              |  |
| 107. Deck Type: N/A (NBI)   |   |  | 2017-same  |                |                                 |   |  |
| 108a. Wearing Surface: N/A (no deck<br>108b Membrane: N/A (no deck            |   |  |  | L              | OAD RATING                      | G AND POSTING                                       |  |
|   | ( ))                                    |  | 31. Design Loa   |                |                                 | Date Rated:   | 04/27/2016                                 |
|   | · //                                    |  | 41. Post. Status   | s: A Open,     | no restriction                  | n   | 0  |
|   | ND SERVICE                              |  | 70. Posting:   |                | ove Legal Loa                   |   |  |
| 19. Detour Length: 49.7 mi  | 106. Year Recon                         |  | 63.Op / 65.Inv.  | Rating Meth.:  |                                 | ,   | EV2  |
| 27. Year Built: 1958  | 109. Truck ADT:                         | 16%  |  |                | H<br>31.61                      | HS 3-3  | EV3 SHV<br>0.00 0.00                       |
| 28a/b. Lanes on/und: 2 / 0<br>29. ADT: 4,200                                  |   |  | 64. Operating F  | • • •          | 18.96                           |   |  |
| 30. Year of ADT: 2017   |   |  | 66. Inventory R  | ating (tons):  | 10.90                           | 34.17 52.86   | -1.00                                      |
| 42a/b. Type of Svc on/und: Highway  | / / V                                   | Vaterway                                       |  |                |                                 | RAISAL  |  |
|   | ,                                       |  | 36a. Brdg Rail:  |                |                                 |   | Not applicable (NBI)                       |
|   | ETRIC DATA                              |  | 36b. Transition:   |                |                                 | 69. Vert./Horiz. Undc<br>71. Waterway Adeq:         | Ir: Not applicable (N<br>8 Equal Desirable |
| 10. Vert. Clearance: 99.99 ft<br>32. Appr Rwy Width: 36.00 ft                 | 50a. Curb/Sdwlk<br>50b. Curb/Sdwlk      |  | 36c. Appr. Rail:<br>36d. Appr.Rail I   | -              | bstandard                       | 71. Waterway Adeq:<br>72. Appr. Alignment:          | 8 Equal Desirable C                        |
| 33. Median: No median   | 51. Width Curb to                       |  | 67. Str Evaluati   |                | e Min Criteri                   |   |  |
| 34. Skew: 0.00°   | 52. Width Out to                        |  | or ou Evaluat  |                |                                 |   |  |
| 35. Struct. Flared: No flare  | Deck Area:                              | 0.00 sq. ft                                    | 94. Bridge Cost  |                |                                 | MPROVEMENTS<br>75. Type of Work: 3                  | 3 Widen w/o Deck E                         |
| 47Horizontal Clr: 59.00 ft  | 53. Min.Vert.Cl.C                       | 5  | 95. Roadway C  |                |                                 | 76. Lngth of Improver                               |  |
| 48. Length Max Span: 10.00 ft   | 54a.Min.Vt.Undc                         | -  | 96. Total Cost:  | \$644 \$       | ,                               | 114. Future ADT:                                    | 6,720                                      |
| 49. Struct. Length: 34.00 ft  | 54b. Min. Vert. U                       |  | 97. Yr.of Cost E   |                |                                 | 115. Yr.of Future AD                                | T: 2037                                    |
|   | 55a. Min.Lat.Und<br>55. Min.Lat.Unde    |  |  |                | NAVIGAT                         |   |  |
|   | 56. Min.Lat.Unde                        |  | 38. Nav. Contro  | ol: Permit     | Not Required                    |   |  |
|   |   |  | 39. Vert. Cleara   |                | 0.0 ft                          | 111. Pier Protect.:                                 | 1 Not Required                             |
| 200c. Temperature: 83   | <u>OKLAHOMA I</u><br>I                  |  | 40. Horiz. Clear   | rance:         | 0.0 ft                          | 116. Lift Bridge Vert.                              | Clr.: 0.0 ft                               |
| 200d. Weather: Ptly Cloudy  | -1/-1                                   | 214a. Posted Weight Limit:                     | NR   | 244            | Span Lengths                    | S'  |  |
| 201. Struc.Stl. ASTM Desig.:<br>202. Waterprf.Membrane: -1                    | -1/-1                                   | b. Posted Speed Limit:                         | 55   | <b>2</b> 77.   | - Pon Longui                    |   |  |
| Date Installed: 01/01/1901  | 1                                       | c. Narrow/1way Brdg Sign:                      | No   | 045            | Girder Depth:                   |   |  |
| 203. Type Exp. Device:  | 1                                       | d. Vertical Clr. Sign:                         | No   | -              | . Type of Ove                   |   |  |
| -   | 1                                       | Adv. Warning Sign:                             | No<br>No   |                | Overlay Thickr                  | old j.  |  |
| 204. Type of Railing: N/A   | 1                                       | e. Navigation Lights?:<br>Working/Not Working: | NA   |                | overlay Date:                   |   |  |
| 205. Material Quantity: -1.00<br>208a. Type of Abutment: _                    | ļ.                                      | 0  | 6. HIGHWAY   |                | Ovly Depth Ch                   | -   | -  |
| b. Type of Found.:  |   | 221. Substr.Cond.(U/W):                        |  | 247.1          | Protective Sys                  | stems:  |  |
| 209. Type of Pier/Found.:   |   | 222. Fill Over RCB: 4                          |  |                |                                 |   |  |
|   |   | 223. Appr.Slab/Rwy Cond.:                      | 1  |                |                                 |   |  |
| 210. Foundation Elev.: -1.00  |   | 225. Paint Type/Ovrct:                         |  |                |                                 | es w/ Corrosion:                                    | 0  |
| -1.00 -1.00   | -1.00                                   | N/A  | A Contraction of the second se |                | Scour Crit. P0<br>Headwall:     | OA Exists?:57.0                                     | 0  |
| 211. Wear.Surf.Prot.Sys: None   |   | 226. Date Painted:<br>227 Paint Color: -1      |  |                | Thru Truss Ty                   |   |  |
|   |   | 227. Paint Color: -1<br>233. Deck Forming:     |  |                |                                 |   | ulvert                                     |
| Date Installed: 01/01/1901  |   |  | rrent & Desired ro   | ute            | Plans w/Foun                    | nd.in ODOT File:                                    |  |
| Date Installed: 01/01/1901<br>213. Utilities Attached:                        |   | 238. School Bus Rte.: Cur                      |  | 0.50           | 2                               |   |  |
|   | 2                                       |  | phalt/Bituminous   | 259.           | Scour Eval. in<br>Interchange a |   | )  |
|   |   | 2001 0011001 240 1401                          |  | 259.<br>263.   |                                 | at Intersection: No                                 | 0<br>.00                                   |

# Oklahoma Dept. of Transportation - Bridge Inspection Report

| <u>NBI No</u><br>1403 |        | <u>Structure N</u><br>4516 0913 |              | <u>Local ID:</u><br>53 | <u>Suff. Rating:</u><br>81.10 | ND |
|-----------------------|--------|---------------------------------|--------------|------------------------|-------------------------------|----|
| Inspection Date:      | 7/2/19 |                                 | Shane Miller |                        |                               |    |
| Invoice No.:          | SM-04  | Inspected With:                 | Dare Obasade |                        |                               |    |

## BRIDGE NOTES:

## INSPECTION NOTES: 7/2/19

All OM-3 signs are missing.

| LEMENT CONDITION STATE DATA |  |          |                 |             |        |      |        |     |        |     |        |
|-----------------------------|--|----------|-----------------|-------------|--------|------|--------|-----|--------|-----|--------|
| Elem. / Env                 | Description                                | Unit     | Total Qty       | % 1         | Qty. 1 | % 2  | Qty. 2 | % 3 | Qty. 3 | % 4 | Qty. 4 |
| 241 / 1                     | Re Conc Culvert                            | ft       | 177.00          | 100%        | 177.00 | 0%   | 0.00   | 0%  | 0.00   | 0%  | 0.00   |
| -1                          |  |          |                 |             |        |      |        |     |        |     |        |
| 961 / 1                     | Scour SF                                   | (EA)     | 1.00            | 100%        | 1.00   | 0%   | 0.00   | 0%  | 0.00   | 0%  | 0.00   |
| FX -                        | A 18in. deep scour hole exists at SE       | corner.  |                 |             |        |      |        |     |        |     |        |
| 965 / 1                     | Debris SF                                  | (EA)     | 1.00            | 0%          | 0.00   | 100% | 1.00   | 0%  | 0.00   | 0%  | 0.00   |
| FX -                        | Silt in two (2) north cells is 12in. to 18 | in. deep | . North cell de | bris is 3ft | deep   |      |        |     |        |     |        |