BRIDGE PLAN DIRECTIVES

2026

2019 STANDARD SPECIFICATIONS

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OKLAHOMA Transportation

FOREWORD

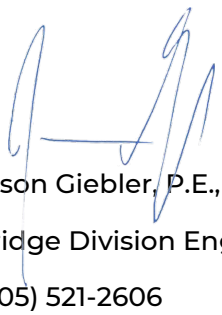
The Oklahoma Department of Transportation (ODOT) Bridge Design Division urges adherence to the Bridge Design Directives (Directives) listed herein to assure uniformity in detailing and drafting convention across the State transportation system. The Directives describe Bridge Division Policy for the production of plans typical to the majority of new bridge construction in the State. This document includes all pertinent information commonly required in the plans as well as procedures for laying out, dimensioning and detailing typical structures and structural components. The Directives should be followed at all times when possible, however, the ultimate design and detailing requirements for any specific set of bridge plans fall upon the judgment of the Engineer of Record for that particular structure or project.

Please forward comments or recommendations on this manual to:

ODOT-cbrgstds@odot.org

Copies of this manual may be obtained through The Bridge Division of the Oklahoma Department of Transportation's website:

https://oklahoma.gov/odot.html



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Bridge Division Engineer

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TABLE OF CONTENTS

TITLE SHEET

1. Design Group Information – Project Engineer and Squad Supervisor names.

2. Survey Control Note.

3. Design Data including Traffic Data and Design Speed.

4. Federal/State Aid Project Number.

5. Project Description.

6. Highway type (State Highway, United States Highway, Interstate Highway etc.) and Crossing (Creek, Highway, etc.). This may be adjusted as needed for multiple bridges.

7. County.

8. Control Section Number This may be adjusted as needed for multiple bridges.

9. Job Piece Number.

10. Bridge name, Location Number, new and existing NBI Numbers.

11. Bridge name, Begin Station, Bridge Length, End Station.

12. Layout Map Information requirements:

    a. Map taken from GIS maps; Map should include a total of 6 sections by 6 sections with the bridge location as centered as possible.
    b. Highway
    c. Township
    d. Range
    e. Sections
    f. To Next Town from the map edge
    g. To be scaled (1”=5,280’)

13. North Arrow.

14. Scales and conventional symbols key.

15. Project Engineering Number. [JP Numbers with (01)]

16. County location Map.

17. Note at the bottom left corner stating:

    2019 STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION GOVERN, APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION, DECEMBER 18, 2019.

18. New Span bridge or R.C.B. construction projects and rehabilitation projects that widen or extend existing structures shall show the total bridge length on the title sheet.

    This may be omitted for maintenance, repair, and rehabilitation projects that do not substantially replace the existing structure. Bridge length must be shown on the title sheet if work is being done to any span bridge or box such as new widening or extending an existing bridge. Span bridge and box that will receive overlay will need a bridge length shown on the title sheet separate from the roadway length.

    Bridge Length shall be rounded to the nearest 1/100 foot and truncated to 1/1000 mile.

19. Revision Block.

20. Index of Sheets and List of Standards (may move to a dedicated second sheet if Title sheet space is limited).

21. Project Lead Engineering Manager Stamp.

22. Sheet Title Block information.

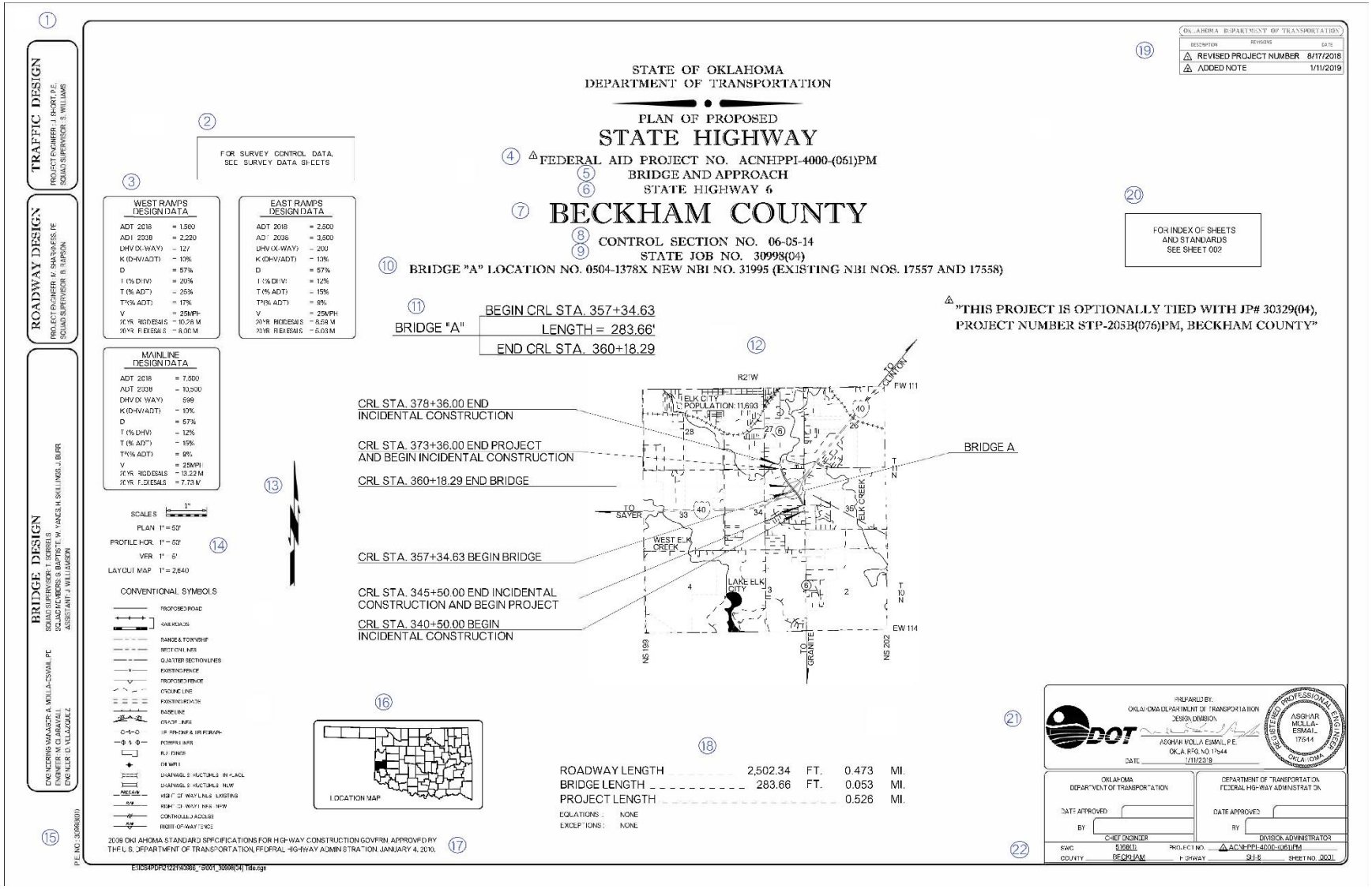


Figure 1. Title Sheet Example

NOTES AND PAY QUANTITIES

1. Bridge Notes. When possible, use the standardized notes for General Notes.

2. Pay Item Notes.

3. Summary of Pay Items (A.W.P. generated only) including bridge description and NBI Number. Items with (PL) must have related plan note included on the sheet. Items with (SP) must have related special provision in the PS&E package. Pay Item descriptions must match A.W.P. descriptions. Pay Items shall be placed in numeric order according to A.W.P. Item Numbers.

■■■■■(04)

PAY QUANTITIES

0200 BRIDGE 'A' - NBI ■■■■■ - DESCRIPTION

ITEM		DESCRIPTION	UNIT	QUANTITY
202(A)	1301	UNCLASSIFIED EXCAVATION	CY	■■■.■■
501(A)	1306	STRUCTURAL EXCAVATION UNCLASSIFIED	CY	■■■.■■
509(A)	1326	CLASS AA CONCRETE	CY	■■■.■■
511(A)	1332	REINFORCING STEEL	LB	■■■.■■
619(B)	2500	REMOVAL OF BRIDGE ITEMS	LSUM	■■■.■■

Figure 2. Quantity Box Example

4. Structures shall start with 0200. Each structure after 0200 will follow in order. Example: Bridge 'A' is 0200, and Bridge 'B' is 0201. This information will be identical to what is entered into A.W.P.

5. Add BR-1 Note (Pay Plan Quantity) for applicable pay items and include other BR notes as needed.

    a. BR notes include:
        i. (BR-1): Payment for this item will be based on Plan Quantities Only. See Section 109.01b of the Standard Specification.
        ii. (BR-X): Refer to Drilled Shaft Foundation Information found in the Standard Specification Section 516 and any material provided in the Contract Documents. Also see Substructure Plan Sheets for Shaft Inspections Device (SID) Locations and Details. (Not Required for 18" Drilled Shafts in Wings if present.)
        iii. (BR-X): This Quantity is for specific amount shown for (Name Repair of Construction Here). See Special Bridge Notes for Applicable Section of the Standard Specifications for Highway Construction.
        iv. (BR-X): Dimensions for this Quantity shall be field verified and the results reported to the Engineer.
        v. (BR-X): The Contractor shall inspect the items as listed in the Bridge Notes and Report their Condition to the Engineer.

6. When the Project is not a “Bridge Project”, the Bridge Division Project Engineer’s P.E. Stamp Block must be located above the standard title block, on the last Notes and Pay Quantities sheet and no larger in width than the title block.

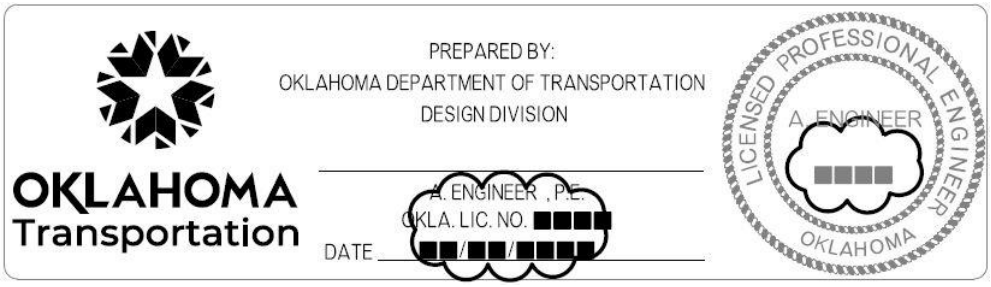


Figure 3. Engineer Stamp Block Example

ROADWAY PLAN AND PROFILE

PLAN VIEW

1. Proposed bridge, including approach slabs, in solid lines.

2. Existing bridge in phantom lines (style 6) with abutments and piers.

3. Description of existing bridge as labeled by Survey.

4. Existing utilities as shown by Survey.

5. Riprap, slope wall or any other auxiliary components.

6. Any channel change or modification with typical section through channel change. Include any necessary Right-of-Way.

7. Name of feature intersected, if channel, show direction of flow.

8. Any other structures designed by Bridge Squad/Team. (retaining wall, DEB's, sound wall, Temporary Earth Retainage, etc.)

PROFILE VIEW

1. Proposed bridge, including approach slabs and headers, as solid lines. Bridge shown in 10:1 Scale.

2. Begin and End Stations with bridge length.

3. Existing ground line and existing structure along Centerline Survey or Profile Grade Line.

4. Description of proposed bridge including bridge name, centerline station, span arrangement, roadway width, skew, and parapet/railing type. For reinforced concrete box, include the bridge name, centerline station, box spans, roadway width, barrel design, and wing design.

5. Inlet and outlet flowline elevations for reinforced concrete box.

6. Subgrade station and elevation for roadway headers.

7. Hydraulic Data. Give Roadway Division the overtopping elevation and back check Plan and Profile sheet for compliance.

GENERAL PLAN AND ELEVATION

General Plan and Elevation sheets are mandatory for all span bridges and Bridge sized reinforced concrete boxes.

TITLE BLOCK

1. Location Information: Include Bridge Name, Intersecting features and county. For instances where there is not enough room, it is permitted to place these items above, or near, the title block.

2. Job Piece Number.

3. Design Squad Information.

4. Bridge description: Include spans, beam type, roadway width, skews, parapet/railing type, and center of bridge station, and alignment that the bridge is on.
    i. Example of Span Bridge, Figure 4a.
    ii. Example of Extending RCB, Figure 4b.
    iii. Example of Construct RCB, Figure 4c.

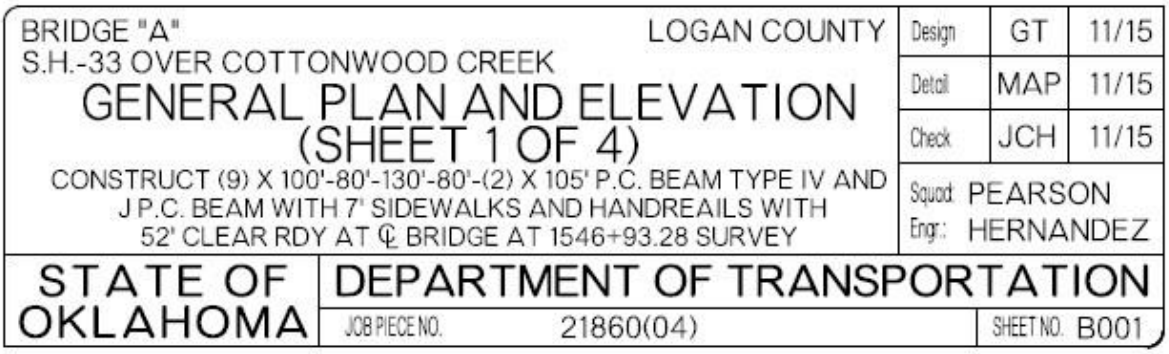


Figure 4a. Title Block Example – Span Bridge

Figure 4b. Title Block Example – Extending RCB

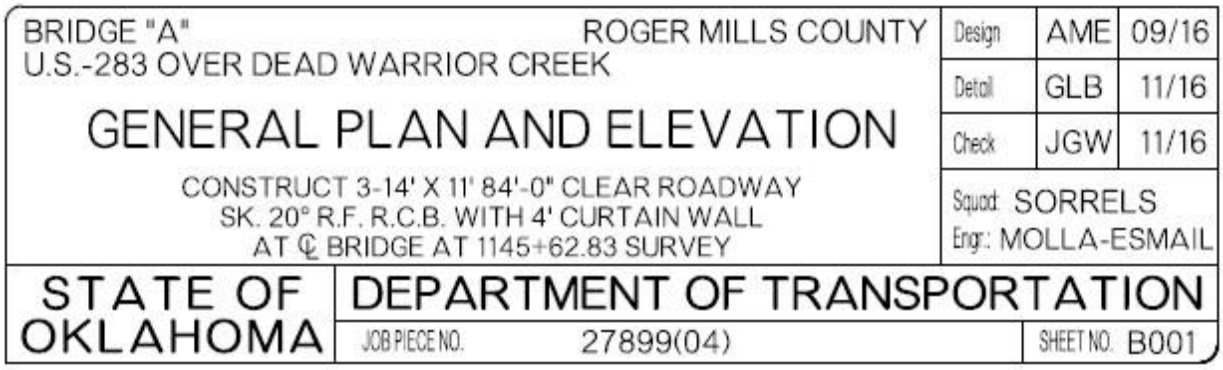


Figure 4c. Title Block Example – Construct RCB

PLAN VIEW

1. Begin and End Stations for approach slab and bridge at finished grade. Show alignment stationing for reference. Alignment information (bearing, stationing, station ticks and labels) (Construction Reference Line, Centerline Survey, Profile Grade Line, Lane and shoulder widths with traffic flow directions using standard lane direction arrows cell, etc...).

2. For grade separation, indicate point of minimum clearance. Station, elevation and offset should be shown where measured.

3. Cross slope value(s) or superelevation value(s)/data.

4. The existing structure, with piers and abutments, shall be shown in phantom lines (style 6).

5. Contours and Elevation Labels of existing ground at 1' intervals, 2' maximum.

6. Proposed bridge header fill, or excavation, shall be shown with the proper line style as required.

7. All Bridge Squad/Team designed structures with reference to detail sheet and specific layouts.

8. Name of feature intersected: At a channel, show direction of flow and use the official USGS Quad Map name. At a grade crossing, show traffic flow directions using standard lane direction arrow cell.

9. Any channel change/modification and references to detail sheet with specific layouts.

10. Existing utilities.

11. Drains at end of bridge (if applicable).

12. Boring/Sounding locations (use standard Target Cell, with proposed boring number).

13. Standard North Arrow.

14. If the Bridge structure is curved, provide a shadow box noting the specific method of design (Chord, Radial, parallel, etc.) on the General Plan and Elevation and Staking Sheets. – See example note below.

    THIS BRIDGE WAS LAID OUT USING THE “CHORD” OF THE INDIVIDUAL SPANS. SUBSTRUCTURE COMPONENTS OF THE BRIDGE ARE TO BE CONSTRUCTED PARALLEL.

15. Location, elevation, station and offset of Survey Benchmarks with at least one for each side of the channel or Grade Separation.

BENCHMARK NO. 11
"X" ON NORTHWEST CORNER CONCRETE WALK ON
NORTHWEST CORNER. OF BRIDGE OVERPASS
OFFSET: 18' LEFT STATION: 1545+88 ELEVATION: 925.51

Figure 5. Benchmark Example

ELEVATION VIEW

1. Proposed stations of Begin/ End Bridge, and centerline of piers, shall be shown. Proposed stations and elevations of Begin/End Approaches, shall be shown. Stations shall be shown along PGL/CRL Alignment when Centerline Survey is not on the bridge. Finish Grade information shall be shown in accordance with the example below. Show stations and elevation grid for reference.

Figure 6. Bridge Station & Finish Grade Example

Figure 7. Approach Station & Finish Grade Example

2. Elevations shall be shown at the top of bridge seat, top of pier cap, and top/bottom of drilled shaft.

3. Fixed, Expansion or Continuous Expansion Joint/Bearing locations are to be indicated by the use of "FIX.", "EXP." or "CONT. EXP." at the locations determined by the Engineer. Where possible, the callout shall be located within the beam line of the particular location.

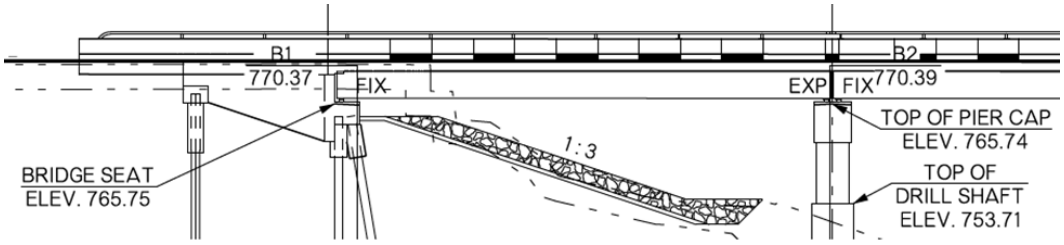


Figure 8. Bridge Joint Call Out Example

4. Length, number and size of piling. When length of straight pile exceeds 37'-0", add 1'-0" to the length of the battered pile. No quantity will be added for pile splices. Do not show bottom of pile elevation. For the purpose of calculations, show pile lengths in 6" increments, however, round quantity to the nearest 1'-0". In areas where pilot holes are required for driving piles, a standard note and detail shall be provided by the Design Engineer / Foundation Engineer. The standard note shall be placed into the general notes and details and shall be placed on the Substructure Staking Diagram sheet.

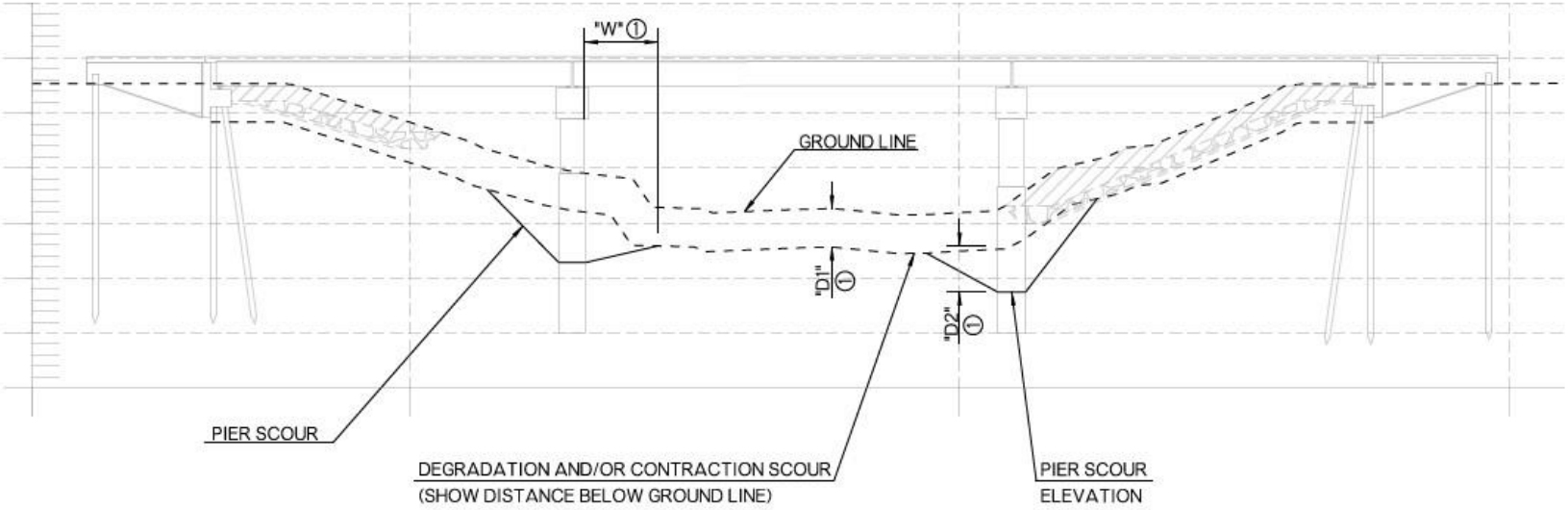
5. Existing ground line along Centerline Survey or Profile Grade Line shall be dashed (style 2). Existing structure, if relevant, shall be shown in phantom lines (style 6). Indicate proposed fill, or excavated slopes including riprap, slope wall or gabions.

6. Foundation information with elevations. Boring location number with tick marks for top, bottom and rock line elevations, do not label rock elevation. "Interpreted Foundation Material" line (style 5) shall be shown connecting rock line elevations at borings. Provide reference to "Foundation Report" sheets for boring data.

7. Indicate true vertical clearance dimension. The dimension shall be calculated and shown in the plans. Lay out the vertical profile of the bridge to meet or exceed the clearances listed below and indicate the location of calculated minimum clearance in plan view.

    a. Grade Separations: 16'-9" Minimum
    b. Railroad Under: 23'-10" Minimum

8. Pier scour lines, as provided by the Bridge Hydraulics Branch. Show degradation/contraction scour line. Scour lines used will need to be the deepest scour option provided for design conditions.



NOTES:

1.) PIER SCOUR AND/OR DEGRADATION/CONTRACTION SCOUR SHOWN FOR INFORMATIONAL PURPOSES ONLY AND NOT FOR CONSTRUCTION.
2.) IN CASES WHERE COMPUTED SCOUR DEPTH IS BELOW DEPTH OF COMPETENT ROCK FOUND THROUGH BRIDGE SOUNDINGS USE THE FOLLOWING STATEMENT.
"FOUNDATION DESIGN BASED ON DEPTH TO SOUNDINGS TESTED AND NOT ON COMPUTED SCOUR DEPTHS."
SCOUR WILL STILL BE PLOTTED AND COMPUTED SCOUR DEPTHS SHOWN ON PLANS.

① NOT TO BE DETAILED ON THE PLANS.

"D1" = DEPTH OF DEGRADATION AND/OR CONTRACTION SCOUR
"D2" =DEPTH OF PIER SCOUR
"W" = "D2" X 2.00

Figure 9. Scour Example

MISCELLANEOUS

1. Design Data.

DESIGN DATA

(LOAD AND RESISTANCE FACTOR DESIGN)

CLASS AA CONCRETE	F'C = 4,000 P.S.I.
CLASS A CONCRETE	F'C = 3,000 P.S.I.
REINFORCING STEEL (GRADE 60)	FY = 60,000 P.S.I.
STRUCTURAL STEEL M270 (GRADE 50W)	FY = 50,000 P.S.I.
STAINLESS STEEL A240 (TYPE 316)	FY = 30,000 P.S.I.

LOADING:
HL-93
OK-175K OVERLOAD TRUCK
OK-315K SPECIAL OVERLOAD TRUCK
20 P.S.F. FUTURE WEARING SURFACE
5 PSF STAY-IN-PLACE FORMS

DESIGN:
AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION
ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE

L.R.F.R. OPERATING RATING: 1.140
L.R.F.R. INVENTORY RATING: 1.478

Figure 10. Design Data Example

2. Foundation Data including Steel Piling Note. (if applicable)

FOUNDATION DATA
ABUTMENTS (HP 10 X 42 PILING)

ABUT. NO. 1 & 2

FACTORED PILE REACTION (TON/PILE) = 82.57

ALL ABUTMENT PILING SHALL BE DRIVEN THROUGH THE COMPACTED FILL. PILING SHALL BE DRIVEN TO A POINT BEARING ON SOLID FOUNDATION MATERIAL AT THE APPROXIMATE ELEVATION SHOWN ON THE PLANS.

IF THE AXIAL LOAD RESISTANCE IS NOT OBTAINED AT THIS ELEVATION, DRIVING SHALL CONTINUE UNTIL THE AXIAL LOAD RESISTANCE IS OBTAINED. THE LENGTH OF STEEL PILING SHOWN ON THE PLANS IS FOR ESTIMATING PURPOSES ONLY.

Figure 11. Foundation Data Example

PIERS (60" DIAMETER DRILLED SHAFTS)

	PIER NO. 1	PIER NO. 2
DEPTHS (FT)		
MINIMUM ROCK SOCKET	10	10
NEGLECTED FOR FRICTION	3	3
FACTORED REACTION (TONS/SHAFT)	591.0	586.3
BEARING RESISTANCE		
RESISTANCE FACTOR	0.7	0.7
NOMINAL UNIT RESISTANCE (TSF)	62.0	62.0
FACTORED END BEARING (TONS/SHAFT)	852.2	852.2
SIDE RESISTANCE		
RESISTANCE FACTOR	0.45	0.45
NOMINAL UNIT RESISTANCE (TSF)	9.75	9.75
FACTORED SIDE (TONS/SHAFT)	482.4	482.4
TOTAL RESISTANCE (TONS/SHAFT)	1,335	1,335

Figure 12. Pier Foundation Data Example

3. List of Standards, (Bridge related).

STANDARDS TO BE INCLUDED

2009 BRIDGE STANDARDS	2019 ROADWAY STANDARDS	2009 TRAFFIC STANDARDS
B40-C-ABUT-MISC-01E	LECS-5-1	GHW1-1-00
B40-C-BRG-RB-01E	PUD-4-0	GHW2-1-00
B40-STL-BM-BRACING-00E	SPI-5-1	SKT-1-00
EJ-DTL-02E		THRI-1-02
EJ-SQ-04E		
HP1-2-01E		
TR4-2-00E		

Figure 13. List of Standards Example

4. Utilities, including names of the owners if known.

UTILITIES

WATER -	CITY OF SAYRE
GAS -	SUMMIT UTILITIES
TELEPHONE -	AT&T
FIBER OPTIC -	PIONEER TELEPHONE CORP.
ELECTRIC -	NORTHFORK ELECTRIC COOPERATIVE

Figure 14. Utilities list Example

5. Hydraulic Summary (if applicable)

BRIDGE 'A' HYDRAULIC DATA

TOTAL DRAINAGE AREA =	11.86	SQ. MI.
CONTROLLED DRAINAGE AREA =	0.00	SQ. MI.
EFFECTIVE DRAINAGE AREA =	11.86	SQ. MI.

FREQ.	Q (CFS)	CHW (FT)	V (FPS)
2	507	1,788.37	2.65
5	1,160	1,790.37	3.70
10	1,730	1,791.60	4.36
25	2,690	1,792.73	5.66
50	3,780	1,793.67	6.89
100	4,700	1,794.33	7.80
500	7,840	1,796.26	10.42

OT = Q002

	Q100	Q500
CONTRACTION SCOUR (FT)	7.14	14.49
PIER SCOUR (FT)	7.20	7.70
TOTAL SCOUR (FT)	14.34	22.19

Figure 15. Hydraulic Summary Example – Span Bridge

BRIDGE 'A' HYDRAULIC DATA

TOTAL DRAINAGE AREA =	8.46	SQ. MI.
CONTROLLED DRAINAGE AREA =	0.00	SQ. MI.
EFFECTIVE DRAINAGE AREA =	8.46	SQ. MI.

FREQ.	Q (CFS)	CHW (FT)	V (FPS)
2	1,240	793.83	4.69
5	2,310	794.81	7.63
10	3,310	795.36	10.00
25	4,950	798.16	13.44
50	6,010	799.90	16.50
100	7,260	801.38	17.24
OT = Q048	5,931	799.77	16.27

Figure 16. Hydraulic Summary Example – RCB Bridge

6. Vertical Profile Data detail for curved and constant profiles.

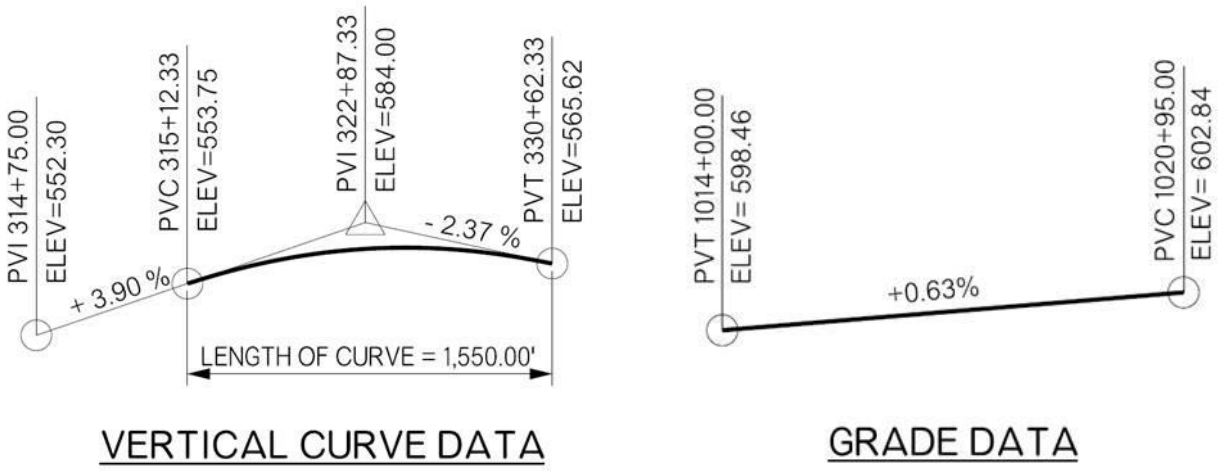


Figure 17. Vertical Profile Data Example for Curved and Constant Profiles

7. Projects with a horizontal curve, add a note to see Plan and Profile or Geometric Layout sheets for horizontal curve information.

8. Index of Sheets (Bridge related).

INDEX OF SHEETS

NO.	TITLE
0001	TITLE
AB01-AB02	GENERAL NOTES AND PAY QUANTITIES (BRIDGE)
B001-B002	GENERAL PLAN AND ELEVATION
B003-B005	FOUNDATION REPORT
B006	SUBSTRUCTURE STAKING DIAGRAM
B007	TRAFFIC RAIL LAYOUT
B008-B011	ABUTMENT DETAILS
B012-B014	PIER DETAILS
B015-B017	SUPERSTRUCTURE DETAILS
B018	ROLLED BEAM DETAILS
B019-B020	DIAPHRAGM DETAILS
B021	APPROACH SLAB DETAILS
B022	DRAINS AT END OF BRIDGE DETAILS

Figure 18. Index of Sheets Example

9. Stations, elevations and dimensions shall be rounded to the nearest hundredth of a foot.

10. General Plan and Elevation sheet(s) for span bridges shall be developed using multiple sheets. Dedicated sheets for the Plan View(s) and Elevation View(s), the last sheet should show Design Data, Index of Sheets etc.. A note shall be placed on the first sheet(s) directing the reader to the appropriate sheet depicting Design Data, Hydraulic Data and Index of Sheets.

11. General Plan and Elevation sheet(s) for RCBs shall be developed using two sheets. One for the Plan View, and the other for the Elevation View, Design Data, Index of Sheets etc.. A note shall be placed on the first sheet directing the reader to the appropriate sheet depicting Design Data, Hydraulic Data and Index of Sheets.

12. Itemized quantities including abutments, piers, superstructure and total. Pay Item Numbers need not be included. Place quantities on Substructure Layout sheet if space is limited on GP&E sheet(s).

FOUNDATION REPORT

1. Information from boring logs including, but not limited to: boring station, offset, and date completed; identify material descriptions including top of rock; water level(s), laboratory and field-testing results, and respective elevation for each datum. Include a legend/key for acronyms/symbols used.

2. Note stating that groundwater levels may fluctuate.

3. Elevations should be shown, rather than depths.

4. Show borings in order of stationing and scaled vertically.

5. No more than three boring per sheet.

6. Any notes located in the soundings.

7. Top of Rock symbol from Design or Foundation Engineer.

8. Note explaining Interpreted Foundation Material Line shown for estimating purposes only.

9. Geological Statement.

10. Scale elevations and stationing of sounding information (when possible).

11. ODOT contact information for complete Geotechnical Report.

12. Use Geotechnical data as provided by Geotechnical Engineer, however, place on the standard drawing sheet.

13. Include the consulting firm's name or logo in the title block.

SUBSTRUCTURE LAYOUT

1. Dimensioning of all piles and drilled shafts from working points. Dimensions shall not start or end at any concrete line, and shall be shown in decimals of feet to two places.

2. Working Points shall be shown along Profile Grade Line when Centerline Survey is not on the bridge, otherwise, use the Centerline Survey for Working Points. Working Points shall be spelled out and shall not be abbreviated.

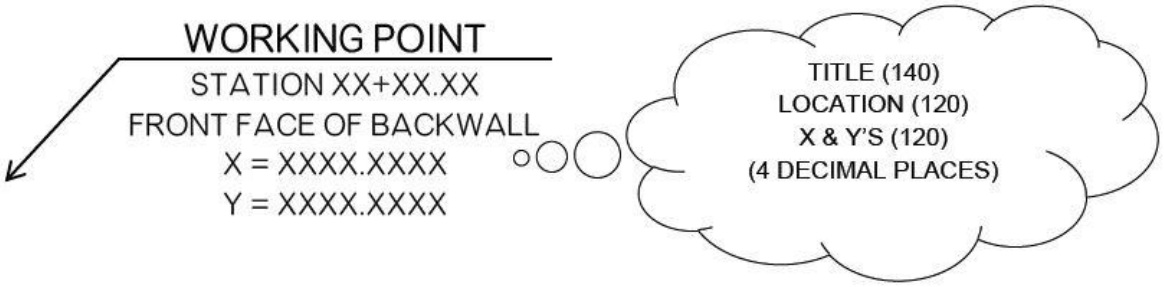


Figure 19. Working Point Example

3. Offset dimension of Profile Grade Line to Centerline Survey (if different lines) including survey stationing if necessary.

4. Typical Section Thru Work Road (if applicable).

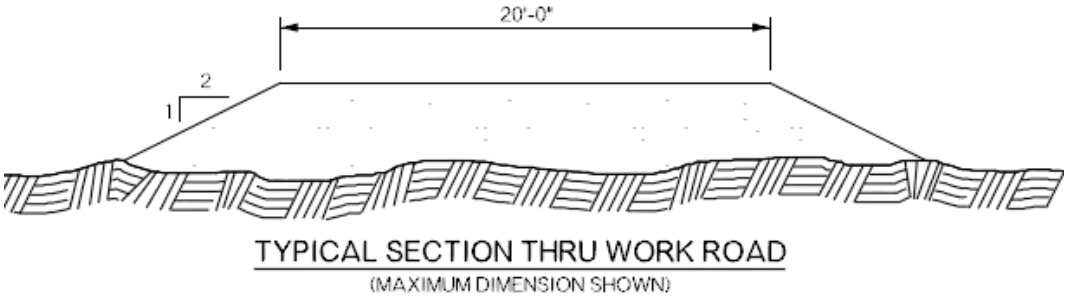


Figure 20. Typical Section Thru Work Road Example

5. All bearings, skew angles, working point stations, dimensions, pile, drilled shaft diameters, and North Arrow.

6. Any concrete lines shown shall be in phantom lines (style 6). (Other than drilled shafts)

7. Place pile note on sheet. “FACE OF PILE WEB SHALL BE PARALLEL TO FACE OF BRIDGE SEAT” for integral abutments. “FACE OF PILE WEB SHALL BE PERPENDICULAR TO FACE OF BRIDGE SEAT” for conventional abutments.

8. Top of pile elevations.

9. Bridge header details including subgrade stations and elevations. If required by Design or Foundation Engineer, show detail of pilot hole.

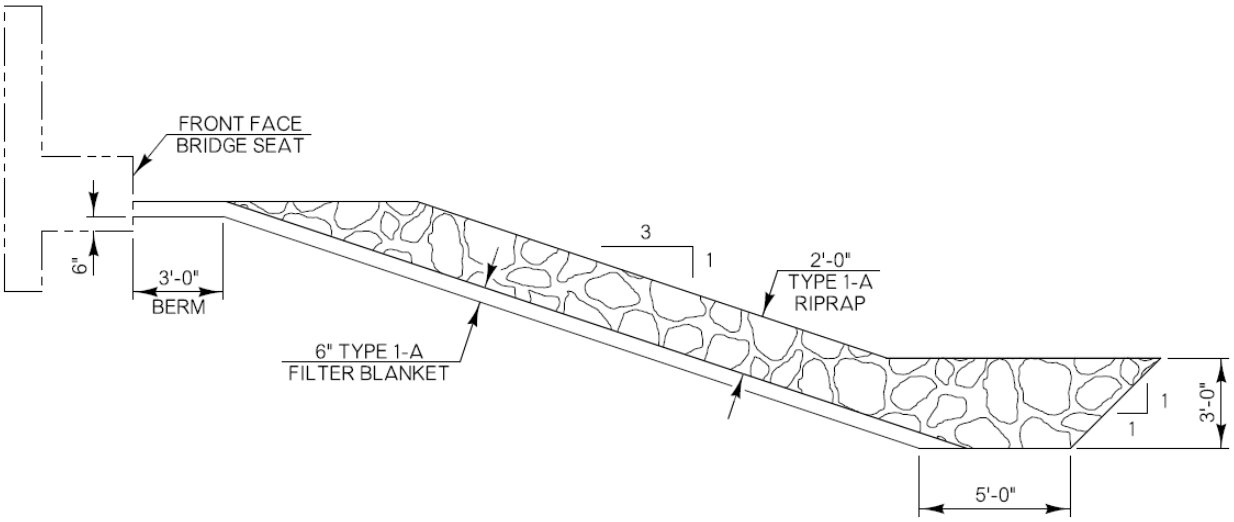


Figure 21. Riprap Section – Conventional Example

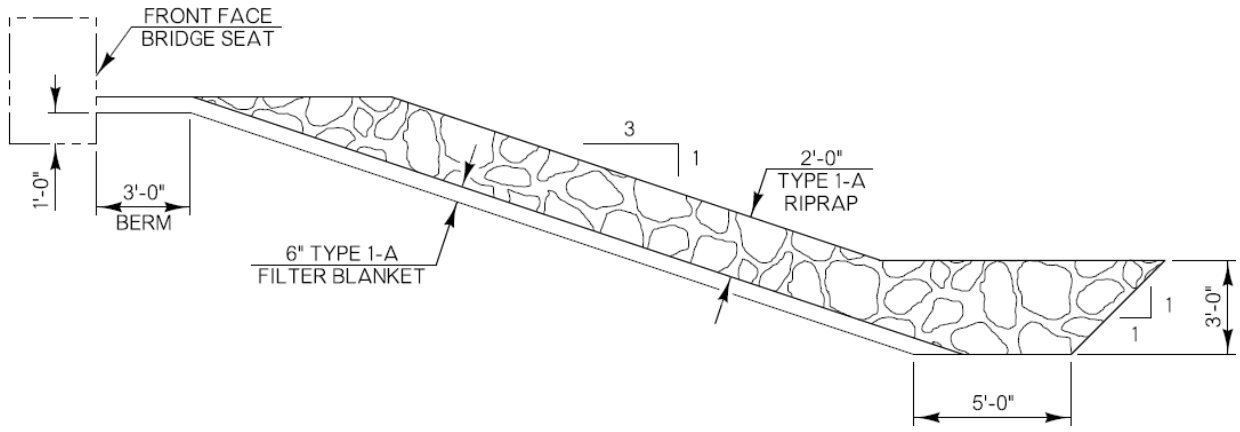


Figure 22. Riprap Section – Integral Example

10. Grading detail providing subgrade station and elevation locations at each end of the bridge.

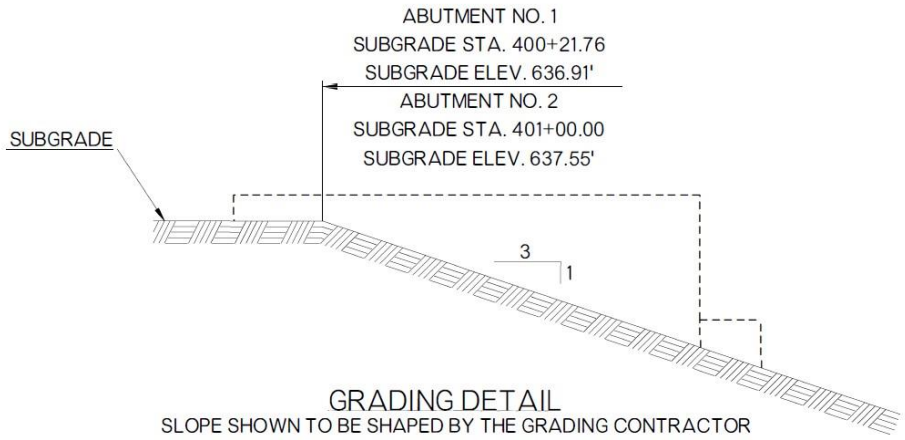


Figure 23. Detail of Grading Example

ABUTMENT

1. Integral abutments is recommended for all non-skewed bridges up to 400’ long including multiple spans. The design engineer will determine appropriate abutment type for the site. Bridges that have slight skews, up to 10 degrees, may be considered for integral abutments on a case by case basis, with approval of the State Bridge Engineer.

2. Dimensions tied to Profile Grade Line and/or Centerline of Survey and Working Points.

3. Plan, elevation, and typical section with dimensions of bridge seat, backwall and pedestals.

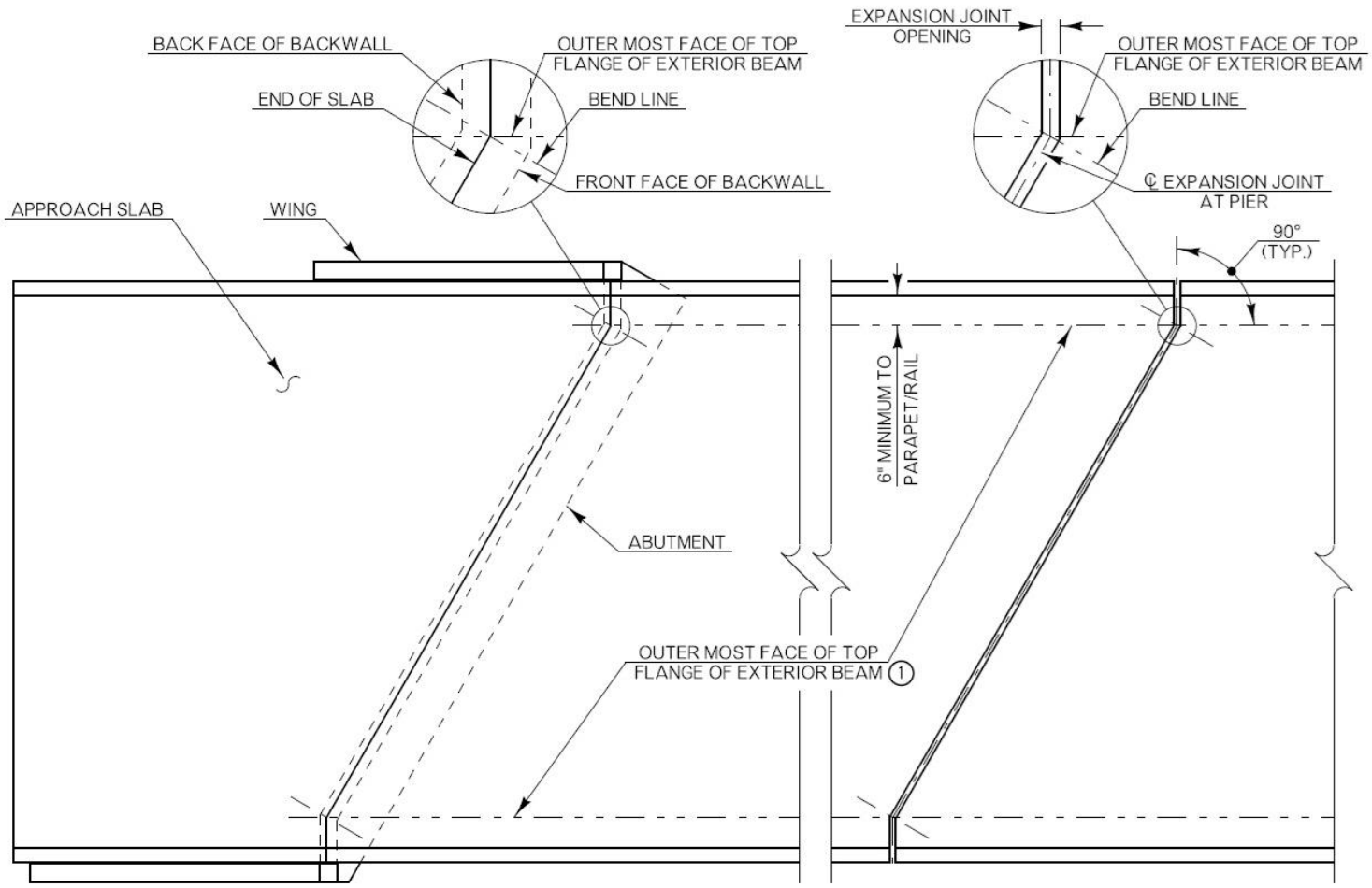
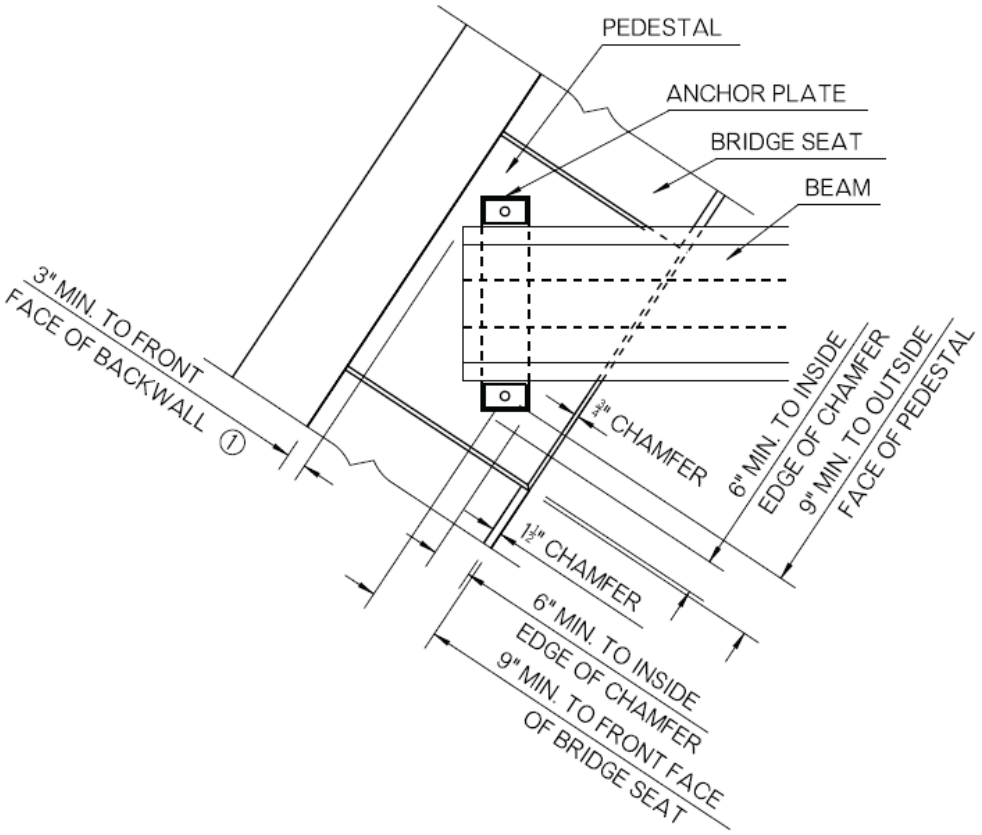


Figure 24. Skewed Break Point Location Example



NOTES:
MINIMUM DIMENSION SHOWN MUST BE MAINTAINED.

① 3" MIN. FOR FIXED BEARING. AT ABUTMENTS USING AN EXPANSION BEARING; ADD THE AMOUNT OF THE SKEWED EXPANSION REQUIRED. MINIMUM CLEARANCE REQUIRED IS FOR EITHER CORNER OF BEAM OR CORNER OF ANCHOR PLATE, WHICHEVER IS CLOSER.

Figure 25. Abutment Pedestal Layout Example

4. Place Note:

   TOP EDGE OF BRIDGE SEAT SHALL HAVE A 1½" CHAMFER. ALL OTHER EXPOSED EDGES SHALL HAVE A ¾" CHAMFER.

5. Bridge seat shall be 3'-0" wide minimum from the front face of backwall to the front face of bridge seat, normal to the backwall. A wider bridge seat may be required to meet the restrictions as shown on Figure 25 Abutment Pedestal Layout Example. Top of bridge seat shall be sloped to drain away from backwall at 5% (perpendicular to backwall). The minimum pedestal height shall be 3", measured at the front face of the backwall. Pedestals shall be reinforced. Pedestals greater than 6" shall have transverse "hoop" bars to be specified by the Design Engineer.

6. Anchor bolt locations and layouts must be shown and detailed, repetitive layouts may be shown once.

7. One pedestal of reinforcing shown is adequate, unless conditions require multiple locations to be shown. Reference pedestals by a letter to the elevation schedule.

8. Wings shall be positioned outside the approach slab width. Indicate pile encasement within the details. See standard HP1-2.

9. All bearings, skew angles, working point stations (location described with no abbreviations), pile size(s) and North Arrow.

10. Top of bridge seat elevation (Conventional - front face of backwall, Integral - back face of bridge seat).

11. Bond breaker shall not be used between the top of backwall and bridge slab/approach slab.

12. Surfaces of the bridge seat and curtain wall to be poured against soil, shall have 3” clearance to reinforcing steel.

13. Water repellent shall be applied on the exposed face of the bridge seat. See Bridge Standard drawings for more details.

14. Elastomeric Coating (CIM 1000) notes and details.

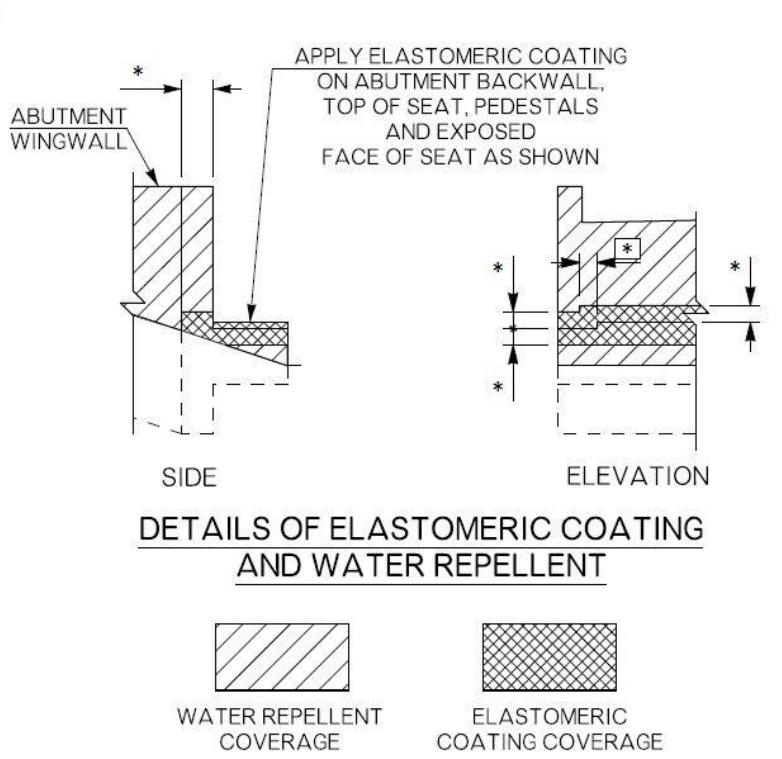


Figure 26. Elastomeric Coating (CIM1000) at Abutments Example

15. Reinforcing bar bends, and reinforcing bar List. Round all bar lengths down to the nearest 1”.

16. Quantity box containing abutment quantities along with wing quantities.

17. Drilled shafts at Abutments:
    a. Drilled shaft size and pay length, including minimum drilled shaft into rock.
    b. Top and bottom of drilled shaft elevations.
    c. Reinforcing projecting from Drilled Shafts into Abutment.
    d. Place note:

REINFORCING BARS PROJECTING FROM THE DRILLED SHAFT SHALL BE INCLUDED IN THE COST OF THE DRILLED SHAFT. THE PROJECTION LENGTH SHALL NOT BE CONSIDERED ADDITIONAL PAY LENGTH FOR DRILLED SHAFT.

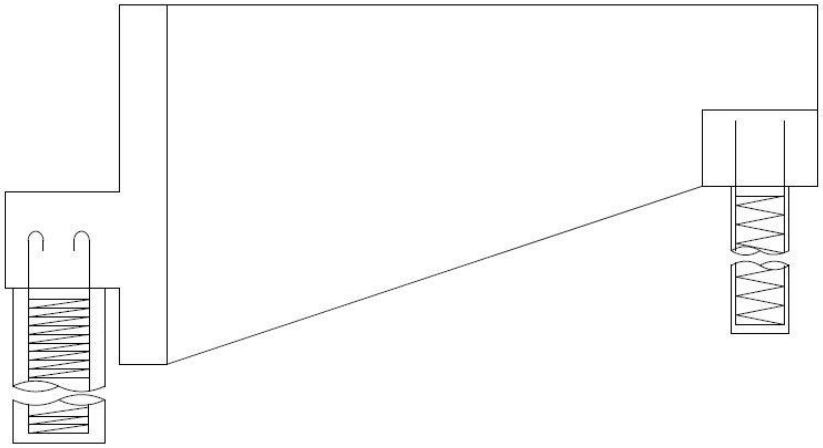
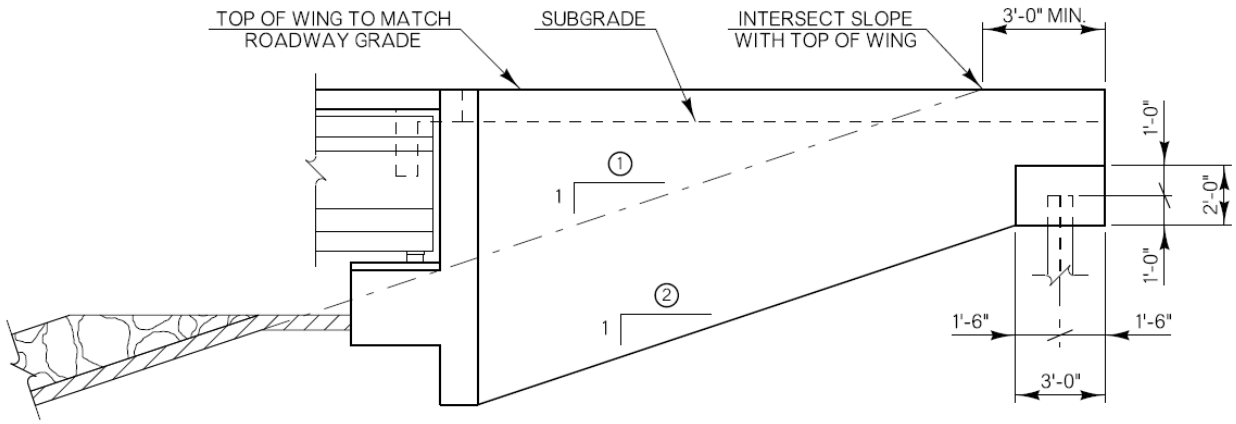


Figure 27. Drilled Shafts at Abutment and Wings Example

WINGS

1. All wings shall be triangular unless design requirements dictate otherwise.



NOTE: CONVENTIONAL WING SHOWN. USE ONLY FOR NON-STANDARD WINGS.
① SLOPE TO BE DETERMINDED BY DESIGN ENGINEER.
② SLOPE TO BE DETERMINDED BY LENGTH OF WING.

Figure 28. Conventional Wing Length Requirement

2. Details and dimensions of wings.

3. Detail and Note on detail sheet stating that the Roadway face of wing shall not be chamfered.

4. For conventional structures, place pile encasements in accordance with Standard HP1-2. Further, piles shall be embedded vertically in the wing a minimum of 1'-0", have a minimum of 1'-0" vertical cover and shall have a minimum of 6" horizontal clearance. HP1-2 Pile Encasement Standard shall be applied to exposed pile.

5. Piles shall not be used in wings on integral bridges.

6. When wing exceeds 20' in length, a second pile may be specified. If wing is structurally adequate, the Design Engineer may determine the second pile may not be required.

7. If the vertical profile grade exceeds 1.5%, the standard wing is not applicable, and a special design is warranted. In this case, elevations should be indicated on both front and rear faces of the wing.

8. Bottom surface of wings that can be poured against soil shall have 3” clearance to reinforcing.

9. Reinforcing bar bends. Show reinforcing bar list. Round all bar lengths down to the nearest 1”.

10. Drilled shafts at Wings:

    a. Drilled shaft size and pay length, including minimum drilled shaft into rock.
    b. Top and bottom of drilled shaft elevations.
    c. Reinforcing projecting from Drilled Shafts into the Wing end. See Figure 27. Drilled Shafts at Abutment and Wings Example.
    d. Place note:

       REINFORCING BARS PROJECTING FROM THE DRILLED SHAFT SHALL BE INCLUDED IN THE COST OF THE DRILLED SHAFT. THE PROJECTION LENGTH SHALL NOT BE CONSIDERED ADDITIONAL PAY LENGTH FOR DRILLED SHAFT.

11. Quantity box.

BRIDGE EXCAVATION / PIPE UNDERDRAIN

1. Span Bridge

    a. Details and dimensions of all excavation and fill around abutments and wings.

    b. Details of pipe underdrain installation.

See Standards B40-I-ABUT-MISC OR B40-C-ABUT-MISC for detailed examples.

2. Reinforced Concrete Box (RCB)

    a. Excavation to be completed in accordance with Roadway Standard SBI-5. For a typical RCB, an Excavation Detail sheet may not be required.
    b. For soft uneven ground, or when settling is a concern, use the Optional Bedding Material Aggregate Base.

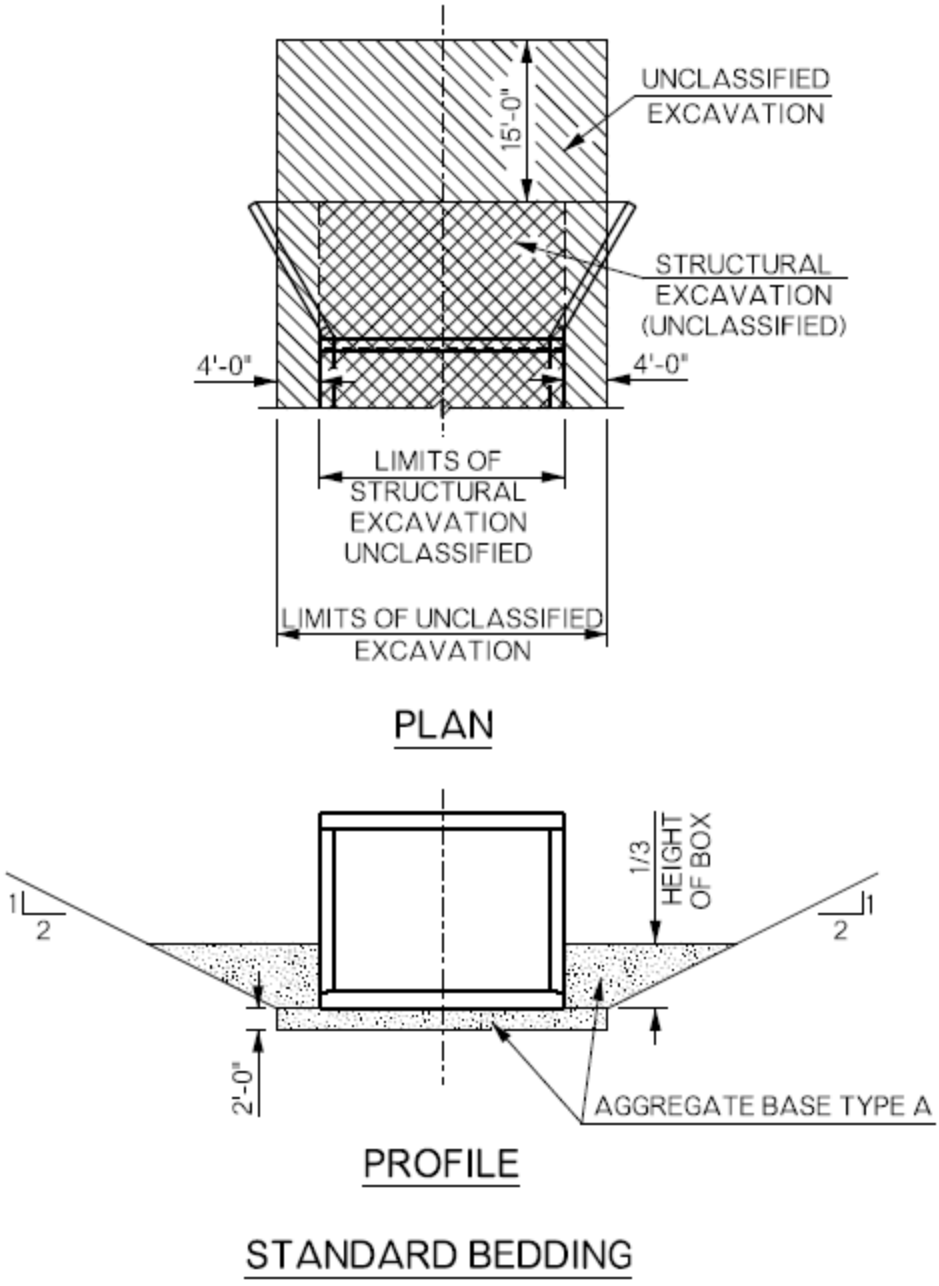


Figure 29. Optional Bedding Material Aggregate Base Detail Example

PIER

1. Dimensions tied to Profile Grade Line and/or Centerline of Survey and Working Points.

2. Place note:

   ALL EDGES OF PIER CAP SHALL HAVE A 1 ½" CHAMFER EXCEPT FOR PEDESTAL EDGES WHICH SHALL HAVE A ¾" CHAMFER.

3. Plan, elevation, typical section and end views with dimensions of pier cap and pedestals. Pier cap width shall be determined taking into account restrictions shown on the Pier Pedestal Layout Example.

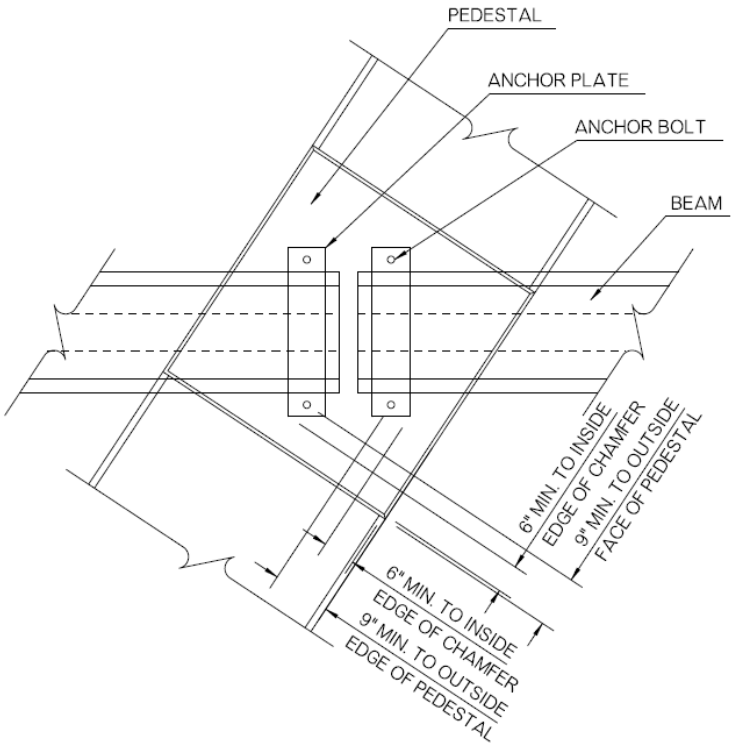


Figure 30. Pier Pedestal Layout Example.

4. Top of pier caps are to be “roof-topped” in shape and shall slope to the edges at a rate of 5% perpendicular to centerline of pier cap. The pier cap vertical dimension and elevation shall be measured from the peak of the slope.

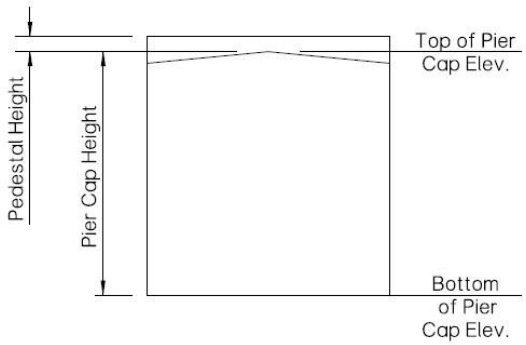


Figure 31. Roof Top Pier Cap Example

5. Edge of exterior pedestals shall be minimum of 3” from end of pier cap. The minimum pedestal height shall be 3” as measured from the peak of the sloped pier cap. Pedestals shall be reinforced. Pedestals greater than 6” shall have transverse “hoop” bars to be specified by the Design Engineer.

6. When stepped pier cap is required, both levels of pedestals in beam line shall be the same height. Grade adjustment from bearing to bearing shall be accounted for in the step. Lower elevation shall be shown on the plans. Each stepped side should slope to drain from the centerline of pier at a rate of 5% perpendicular to pier cap.

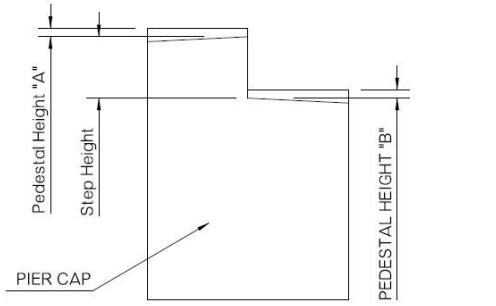


Figure 32. Stepped Pier Cap Example

7. All bearings, skew angles, working point stations (location described with no abbreviations), drilled shaft sizes and North Arrow shall be shown on the sheet.

8. Anchor bolt locations and layouts shown and detailed, repetitive layouts may be shown once. Pedestals shall be indicated by a letter and related to an elevation schedule.

9. All pier cap reinforcing, and any column / drilled shaft reinforcing projecting into pier cap, shall be epoxy coated.

10. Top of pier cap elevation (measured at peak of slope), and top and bottom drilled shaft elevations to be shown. Common dimensional guidelines:

    a. Column lengths to be figured in 3” increments.
    b. Drilled shaft lengths to be figured in 12” increments.
    c. For piers with sloping pier caps, column lengths may be varied.

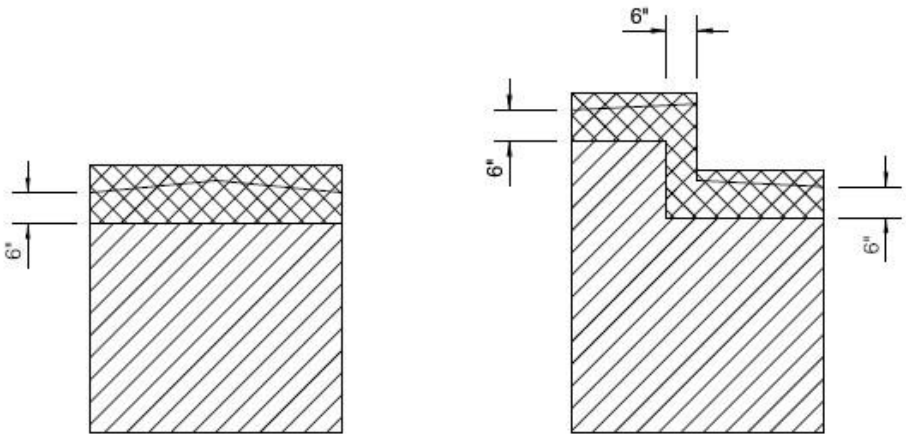
11. Construction keys between pier cap and column/drilled shaft, shall be formed downward.

12. Drilled shafts at Piers:

    a. Drilled shaft size and pay length, including minimum drilled shaft into rock.
    b. Top and bottom of drilled shaft elevations.
    c. Reinforcing projecting from Drilled Shafts into pier cap.
    d. Place note:

    REINFORCING BARS PROJECTING FROM THE DRILLED SHAFT SHALL BE INCLUDED IN THE COST OF THE DRILLED SHAFT. THE PROJECTION LENGTH SHALL NOT BE CONSIDERED ADDITIONAL PAY LENGTH FOR DRILLED SHAFT.

13. Elastomeric Coating (CIM 1000) notes and details.



"ROOF TOP" PIER CAP STEPPED PIER CAP

NOTES FOR ELASTOMERIC COATING

1. MASK FACE AT ENDS AND SIDES OF PIER CAP TO PROVIDE A CLEAN, STRAIGHT FINISH AT EDGES OF ELASTOMERIC COATING APPLICATION.
2. APPLY ELASTOMERIC COATING TO SURFACES INDICATED. INCLUDING TOP OF PIER CAP AND ALL SURFACES OF THE PEDESTALS AS SHOWN.
3. TREAT THE REMAINING SURFACES OF THE PIER CAP WITH A PENETRATING WATER REPELLENT SURFACE TREATMENT AS SHOWN (THE WATER REPELLENT WILL SLIGHTLY OVERLAP THE ELASTOMERIC COATING)

Figure 33. Elastomeric Coating (CIM1000) at Pier Cap Example

14. Specific Details

a. Spiral Bar Splice
   i. 2’-0” splice length
   ii. 10” Hooks
b. Roller Detail See Figure 34, Pier Column and Drilled Shaft Information
c. Section Views of Drilled Shaft and/or Column

15. Tie bars in top of drilled shaft shall have 1'-0" lap with 6" hooks.

16. Column reinforcing shall have 4" clearance on the sides, 3" clearance on the bottom and 2" clearance on the top.

17. Drilled shaft reinforcing shall have 6" clearance sides and 3" top and bottom.

18. Reinforcing bar bends.

19. Reinforcing bar list. Round all bar lengths down to the nearest 1".

20. Quantity box. A reinforcing splice is required if reinforcing length exceeds 60 ft.

    a. Add a note to stagger the drilled shaft bar laps if required.
    b. Provide the splice requirement for a spiral bar.

21. Crosshole Sonic Logging (CSL) Tubes shall be accounted for in clearances and the number of CLS tubes shall correspond to the diameter of the drilled shafts, one tube per foot of diameter. See Section B-B in Figure 34. Pier Column and Drilled Shaft Information. Pay Item, Crosshole Sonic Logging, shall be included in the quantity boxes.

22. Drilled shaft concrete is specified as Class AA per Subsection 516.02 in the ODOT Standard Specifications. In design calculations, drilled shaft concrete shall be modeled as having a 28 day compressive strength of 3,000 psi. This reduction in concrete design strength will, in effect, provide a factor of safety in drilled shaft material and construction quality mitigating the need for costly repair and/or replacement due to deficiencies in the as-built drilled shaft. Concrete compressive strength of 3,000 psi is for calculation purposes only and shall not be reported in the plans.

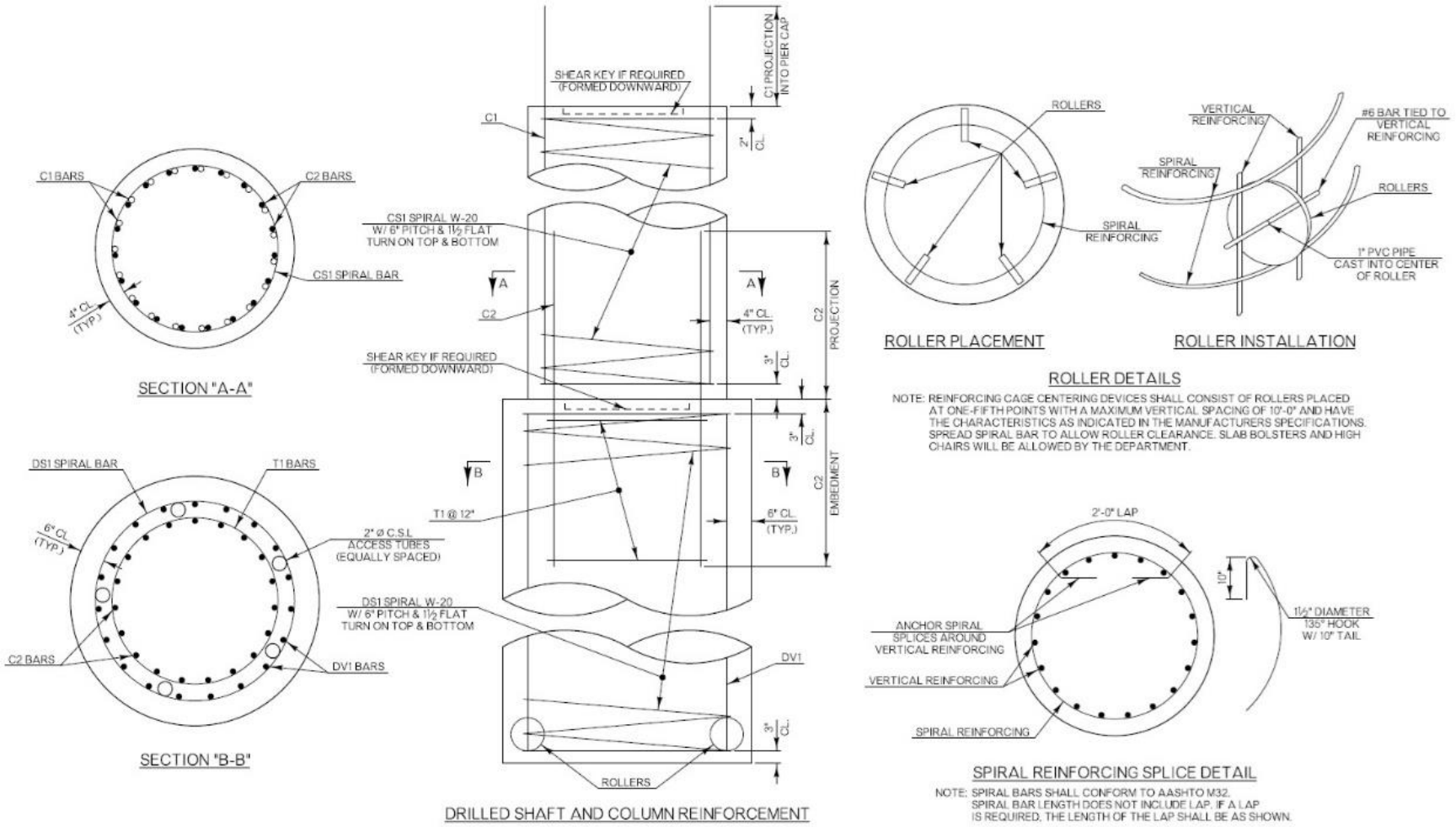


Figure 34. Pier Column and Drilled Shaft Information

SUPERSTRUCTURE

1. Dimensions tied to the Profile Grade Line and/or Centerline Survey.

2. Details and dimensions of deck, diaphragms, parapet/traffic rails with openings. Joints in parapet/traffic rails shall match joints in slab. Concrete Diaphragms shall be 9” thick. J Beam Concrete diaphragms shall be 10” thick. Steel diaphragms for PCB beams shall be approved by Design Engineer.

3. No taper in the bridge deck overhang. Include drip bead.

4. Locate all fixed and expansion bearing locations.

5. The actual haunch height is to be calculated by the contractor, and verified by the Design Engineer. For steel plate girders, the estimated haunch concrete quantity in the Plans shall be calculated based on full height of haunch at centerline bearing for full length of haunch between end diaphragms. For prestressed concrete and rolled steel beams, the estimated haunch concrete quantity in the Plans shall be calculated based on half height of haunch at centerline bearing for full length of haunch between end diaphragms.

6. The estimated haunch depth at the centerline of bearing shall be shown in the Plans. The haunch depth shown for rolled steel and prestressed concrete beams shall measure from top of flange to bottom of deck. For plate girders, the haunch shall measure from top of web to bottom of deck, also, the Design Engineer shall account for camber tolerances allowance for fabrication (according to AWS D1.5, Section 3.5) in the designed haunch. This is to ensure that excessive negative haunches do not occur in the field.

7. H Dimension (Dimension from top of slab to bottom of bearing assembly at centerline bearing).

8. Plan view of deck reinforcing for skewed bridges.

9. Locate and describe all types of construction joints and expansion joint devices.

10. Epoxy coat all deck reinforcing and any reinforcing projecting into the deck.

11. Slab pouring sequence if required (provided by the Design Engineer).

12. Longitudinal deck reinforcing shall continue through fixed locations for all bridge types. Conventional bridges shall have a cold poured joint over the pier and not a continuous pour (unless otherwise specified by the Design Engineer). Do not place reinforcing laps at the pier. Integral bridges shall have a closure pour directly over the pier and shall have a slab pouring sequence. The joints at the panel ends shall be a cold pour. Do not saw and seal these joints. The annual statewide water repellent (silane) project shall apply High Molecular Weight Methacrylate (HMWM) sealant to all deck joints.

13. Diaphragm bolt details.

14. Bearing assembly (including contact plates, angles, beveled anchor plates, and oversized slots in anchor plates, all to be provided by the Design Engineer if needed).

    a. Bevel of anchor plate shall be calculated by the Design Engineer.
    b. Plan note shall be included stating the thick edge to be painted red.
    c. Orientation of plates to be shown.
    d. See detail (Figure 35) for method of showing beveled plate.

15. Minimum 1½" thick anchor plates except for integral abutments which shall have 1" thick x 6" wide anchor plates at the abutment. When plates are beveled, thin edge shall be a minimum of 1".

16. Use ⅜" weld between anchor plate and encased sole plate.

17. The gap left in the end diaphragm at the anchor plate location on integral abutments shall be filled with silicone sealant.

18. Edge of slots or holes in anchor plates shall be minimum 1" from edge of anchor plate in the transverse direction and minimum 1½" in the longitudinal direction.

19. Minimum 1½" diameter anchor bolts set minimum 15" into concrete. For integral abutments use 1½" diameter reinforcing bars with deformation removed from protruding portion.

20. Penetrating water repellent treatment of concrete surfaces shall be applied to the following:

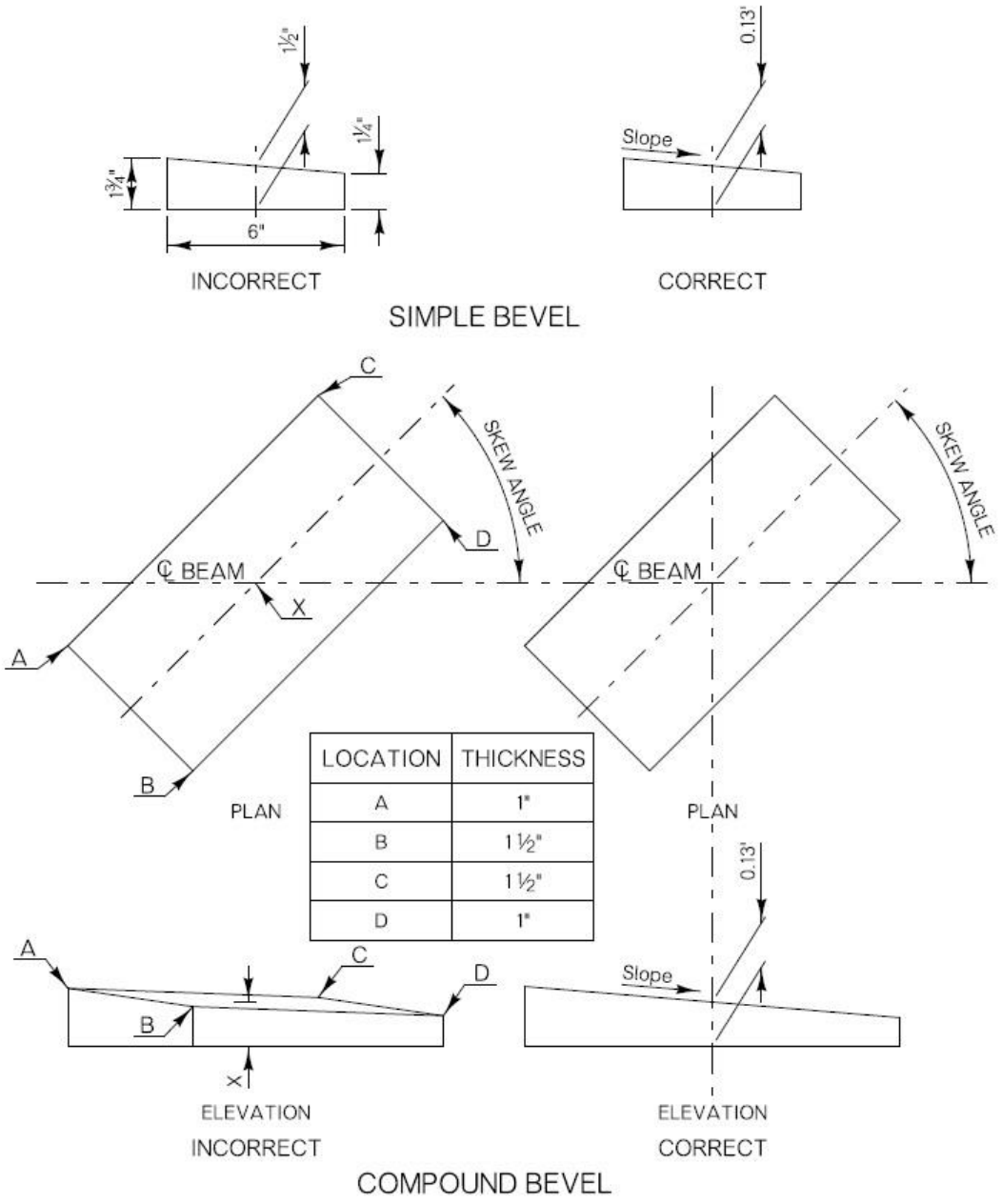
    a. Traffic Rail or Parapet.
        i. Roadway face.
        ii. Top face.
        iii. Interior of traffic rail openings.
        iv. Top of deck slab under traffic rail openings.
    b. Outside edge and bottom of overhang portion of deck slab.
    c. Exterior face and bottom of exterior concrete beams.

21. Reinforcing bar bends.

22. Reinforcing bar list. Round all bars down to the nearest 1".

23. Quantity box.

24. Temperature Expansion Chart as calculated by the Design Engineer.



NOTE: Show only centerline thickness (to 2 decimal places) and slope of bevel.

Do not show corner thickness as they may not match exact dimensions.

Designer shall determine minimum thickness and slope of plate.

Figure 35. Beveled Anchor Plate Example

PRESTRESSED CONCRETE BEAM

1. Details and dimensions of beams.

2. Interface shear or haunch reinforcing bars shall be epoxy coated and the projection lengths shown (may vary).

3. An elastomeric pad shall be placed on top of prestressed concrete beam ends at piers for integral bridges.

4. Beam dead load deflection shown at tenth points from centerline bearing to centerline bearing.

5. Embedded sole plate must be 4” larger than anchor plate to provide approximately 2” construction tolerance.

6. Details of embedded sole plate and embedded beam plate for expansion device connection.

7. Reinforcing bar bends.

8. Diaphragm holes spaced to avoid Reinforcing Steel.

9. Debonding schedule as required by the Design Engineer.

STRUCTURAL STEEL

1. Details and dimensions of beams including shear connectors, all stiffeners, diaphragms, field splices, welding symbols/call-outs, and tension and compression locations.

2. Layout of diaphragm locations.

3. Detail of alternate welded splice.

4. Clipped corner detail, at stiffeners, showing weld terminating ⅜" + or - ⅛" from clipped corner.

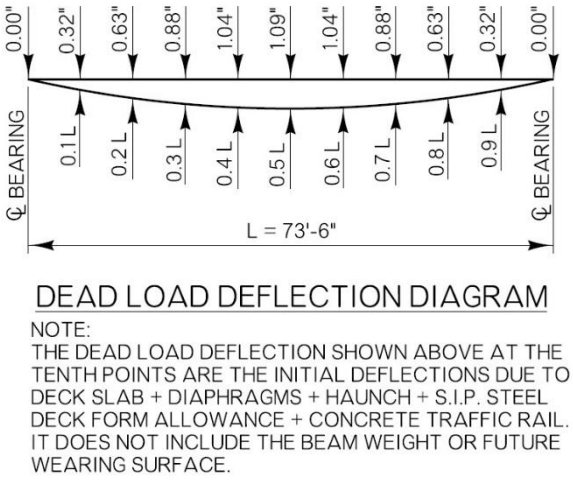
5. Show all field welds with appropriate symbology.

6. All steel designations shall be AASHTO instead of ASTM if possible.

7. All structural steel shall be unpainted weathering steel unless otherwise specified by the Design Engineer.

8. Detail fillet welds deposited on opposite sides of common plane of contact between two parts being terminated at a corner by a distance of ⅜" + or - ⅛".

9. Beam dead load deflection shown at tenth points from CL Bearing to CL Bearing. For plate girders, Blocking Diagrams are not provided in the plans. However, the finished grade elevations at tenth points for each span shall be provided in the plans. Negative values indicate upward deflection, while positive values indicate downward deflection.



DEAD LOAD DEFLECTION DIAGRAM

NOTE:
THE DEAD LOAD DEFLECTION SHOWN ABOVE AT THE TENTH POINTS ARE THE INITIAL DEFLECTIONS DUE TO DECK SLAB + DIAPHRAGMS + HAUNCH + S.I.P. STEEL DECK FORM ALLOWANCE + CONCRETE TRAFFIC RAIL. IT DOES NOT INCLUDE THE BEAM WEIGHT OR FUTURE WEARING SURFACE.

Figure 36. Concrete Beam Deadload Example.

DEFLECTION SCHEDULE

SPAN	BEAM AND DIAPHRAGM DEFLECTION						SLAB, HAUNCH, S.I.P. STEEL DECK FORMS AND TRAFFIC RAIL DEFLECTION ①					
	℄ BRG	0.1 & 0.9	0.2 & 0.8	0.3 & 0.7	0.4 & 0.6	0.5	℄ BRG	0.1 & 0.9	0.2 & 0.8	0.3 & 0.7	0.4 & 0.6	0.5
55'	0.00"	0.03"	0.06"	0.09"	0.10"	0.11"	0.00"	0.30"	0.57"	0.78"	0.92"	0.97"
60'	0.00"	0.05"	0.09"	0.12"	0.14"	0.15"	0.00"	0.37"	0.71"	0.97"	1.14"	1.19"
65'	0.00"	0.06"	0.11"	0.15"	0.17"	0.18"	0.00"	0.41"	0.77"	1.05"	1.23"	1.29"
70'	0.00"	0.07"	0.14"	0.19"	0.22"	0.23"	0.00"	0.48"	0.91"	1.25"	1.46"	1.53"
75'	0.00"	0.10"	0.18"	0.25"	0.29"	0.30"	0.00"	0.57"	1.08"	1.48"	1.73"	1.82"

① THE DEAD LOAD DEFLECTION SHOWN AT THE TENTH POINTS ARE THE DEFLECTIONS DUE TO DECK SLAB + HAUNCH + S.I.P. STEEL DECK FORM ALLOWANCE + TRAFFIC RAIL DEFLECTION. IT DOES NOT INCLUDE THE BEAM WEIGHT, DIAPHRAGMS OR FUTURE WEARING SURFACE.

Figure 37. Steel Beam Deadload Example.

APPROACH SLAB

1. All bearings, skew angles, Begin/End approach slab stations, and details/dimensions of approach slabs.

2. Reinforcing layout in the approach slab including embedded parapet/traffic rail reinforcing.

3. A 3/8” wide, 2” deep sawed and sealed longitudinal control crack joint shall be placed between driving lanes. In case of long approach slabs, sawed/sealed transverse control crack joints should be considered.

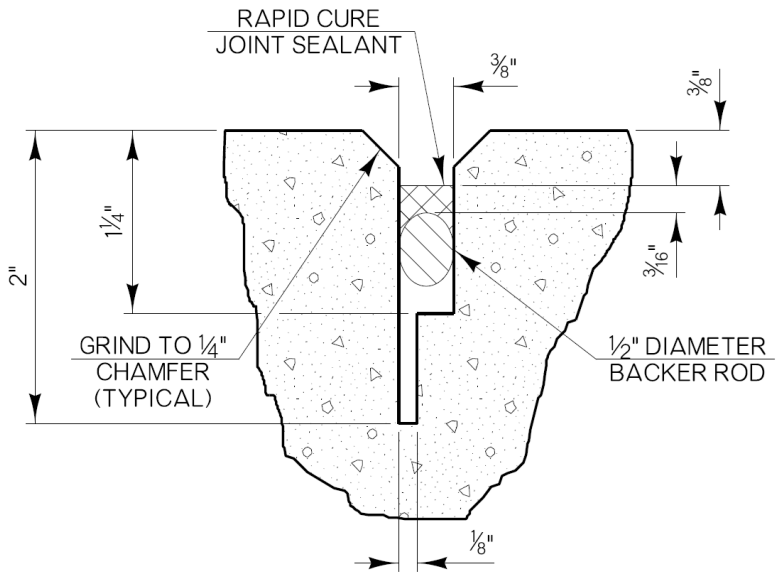


Figure 38. Control Crack Example

4. Fixed joints between the approach slab and the bridge deck require a ½" wide, 3" deep sawed and sealed construction joint.

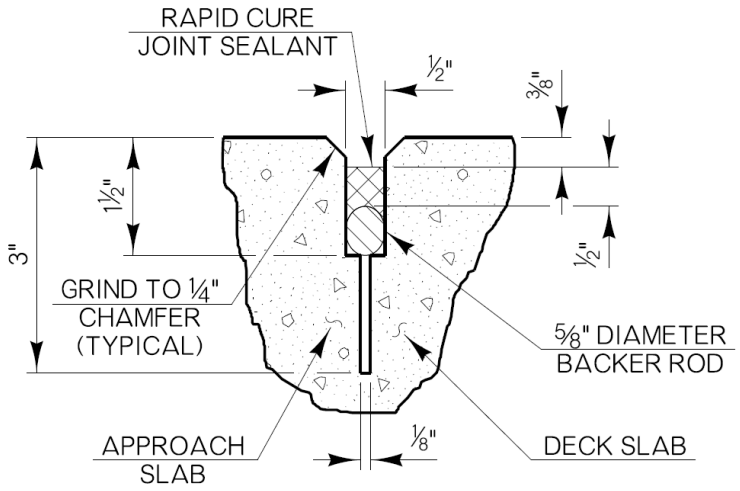


Figure 39. Saw and Seal Construction Joint Example

5. Seal between wing and approach with 1" wide rapid cure isolation joint. Cost shall be included in the price bid per S.Y. of Approach Slab.

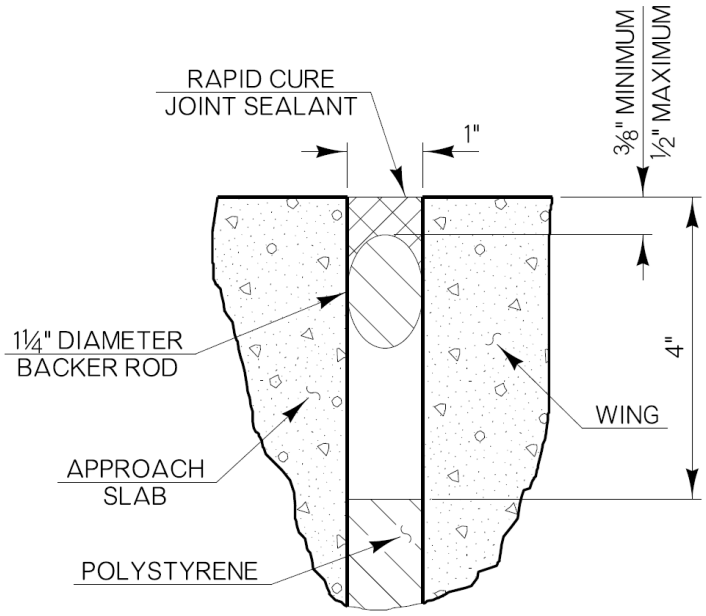


Figure 40. Joint Between Wing and Approach Slab Example

6. Provide longitudinal reinforcing from bottom of approach slab to top of bridge slab for abutments with fixed joints.

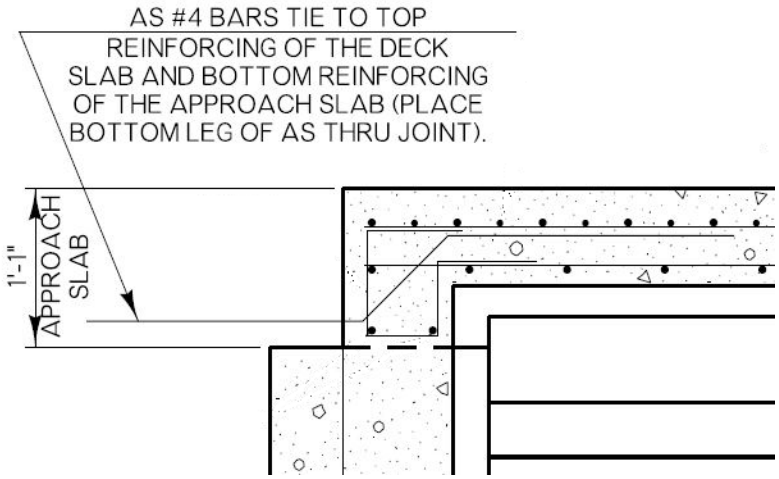


Figure 41. Longitudinal Steel from Deck to Approach Slab Example

7. Bridge railing shall be attached to approach slab and shall extend the full length of the approach slab. SR/FS bars shall be included in the price bid per S.Y. of Approach Slab.

8. Quantity box.

9. Reinforcing bar list.

10. Reinforcing shall be epoxy coated.

11. Details for sleeper slab when required by design.

CONVENTIONAL BRIDGES

1. The standard length of approach slab shall be 30’-0”. When the approach slab exceeds 30’ in length, provide transverse controlled crack joints 3/8" wide, 2” deep, sawed and sealed. Refer to Control Crack Detail, Figure 38.

1. The length of approach slab shall depend on the beam length. For more details, see Bridge Standard B40-I-AS.

2. For longer integral bridges, a two-pour approach slab is to be constructed (with transverse joint), an expansion joint shall be placed between the two sections. The joint size shall be determined by the expansion of the bridge and shall have rapid cure sealant.

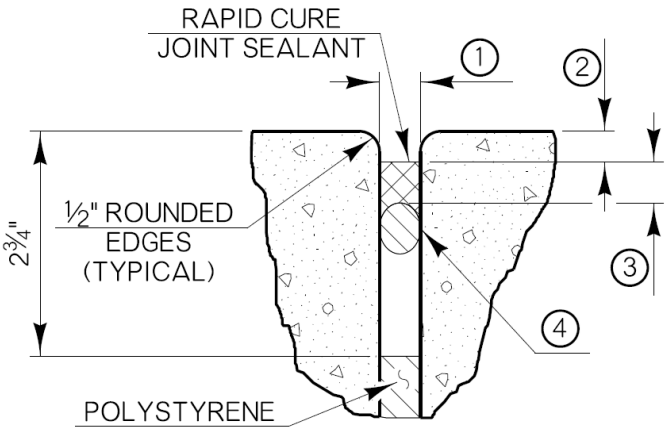


Figure 42. Expansion/Isolation Joint Example

EXPANSION JOINT/ISOLATION JOINT TREATMENT TABLE			
JOINT WIDTH ①	SEALANT RECESS DEPTH ②	SILICONE SEALANT THICKNESS ③	BACKER ROD DIAMETER ④
½"	⅜"	¼"	⅝"
¾"	⅜"	⅜"	⅞"
1"	⅜"	½"	1 ¼"
1 ½"	½"	¾"	2"
2"	½"	¾"	2 ½"

Figure 43. Expansion/Isolation Joint Table Example

3. If Concrete paving is included, reference to Roadway Standards for Continuously Reinforced Concrete Pavement Details CRCP1 and CRCP2.

RIPRAP / SLOPE WALL

1. Plan and Elevation views showing the following:

   a. North Arrow.
   b. Contours.
   c. Fill and/or excavation.
   d. Placement of riprap, concrete slope wall, or gabions.
   e. Include slope angles.

2. Show the header slope perpendicular to the bridge face or as required by design. For riprap shapes and placement, see Figures 21 and 22 of these Directives. Riprap shall not be placed on or beyond pier without approval from Hydraulics Engineer.

3. Type and depth to be determined at Plan-in-Hand meeting or by hydraulics requirements.

4. Use the pay item 601(B) 1210 Type 1 Plain Riprap with Filter Blanket. Include in a pay item note, the quantities for Plain Riprap and Filter Blanket as separate calculations for biding purposes.

5. Quantity of riprap and filter blanket to be carried in tons.

a.	Riprap	110 lbs/C.F.	=	1.49 Tons/C.Y
b.	Filter Blanket	105lbs/C.F.	=	1.42 Tons/C.Y.
c.	TBSC (Type D)	120lbs/C.F.	=	1.62 Tons/C.Y

6. Notes and quantity box.

   Slope walls shall be placed on all grade crossings and rail road crossings. Wrap the header sufficiently to prevent erosion from runoff of the roadway/bridge deck. Slope wall should extend past the bridge deck sufficiently, beyond the “shadow” of the bridge where vegetation will not grow as readily. Extending the slope wall to this point will mitigate erosion from the runoff.

7. Place Note.

RIPRAP AND FILTER BLANKET:
A 24” THICK LAYER OF TYPE I-A PLAIN RIPRAP WITH A 6” THICK LAYER OF TYPE I-A FILTER BLANKET SHALL BE PLACED AT THE ABUTMENTS SHOW IN THE PLAN IN ACCORDANCE WITH SECTION 601 AND OTHER APPLICABLE SECTIONS OF THE 2019 STANDARD SPECIFICATION FOR HIGHWAY CONSTRUCTION.
THE FILTER BLANKET SHALL BE PLACED IN ONE LAYER. THE RIPRAP AND FILTER BLANKET SHALL BE PLACED IN SUCH A WAY AS TO NOT IMPEDE THE FLOW OF THE CHANNEL AND IN A MANNER APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL TAKE CARE TO INSURE THAT THE RIPRAP AND FILTER BLANKET ARE NOT PLACED OVER THE LOCATION OF ANY EXISTING UTILITY LINES OR BEYOND THE LIMITS OF THE RIGHT-OF-WAY. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PRESERVING THE INTEGRITY OF EXISTING AND NEW UTILITIES AND RIGHT-OF-WAY.

REINFORCED CONCRETE BOX

1. General plan and elevation (Refer to General Plan and Elevation of these Plan Directives) and include inlet and outlet flowline elevations. In order to show more of the channel, the GP&E shall utilize two sheets; one for Plan, the other for Elevation, details and design.

2. Details and dimensions of RCB including section through barrel and curbs and any wing details if needed.

3. For calculating barrel length, the following criteria shall be used:

    a. Roadway Typical Sections must be used to determine barrel length. When multiple slopes are shown outside of Clear Zone, the fill height shall be determined using the channel flow line elevation.
    b. Headwalls shall be placed no closer to the roadway than Clear Zone unless otherwise specified by Design Engineer. Roadway Design Division shall provide Clear Zone dimension.
    c. Round barrel length up (between headwalls) to the nearest 1ft, normal to the roadway for skewed and non –skewed RCBs.

4. Maximum headwall height shall be 1’-6” unless otherwise instructed. Minimum headwall height shall be 6" if Clear Zone dictates barrel length.

5. Plan and section views of additional curtain walls. Use 4’ curtain wall unless otherwise directed by Hydraulics Branch or as necessitated by anticipated degradation.

6. Reinforcing Steel to be black steel per standards unless otherwise approved.

7. Reinforcing bar bends.

8. Minimum of 2’ of fill including the design typical section must be placed on top of the barrel for standard design. For less than 2’ of fill, Standard drawings may not be used.

9. Reinforcing bar list. Round all bar lengths down to the nearest 1”. For “at grade” boxes and wingwalls with stubbed in pipes, reinforcing steel shall be epoxy coated.

10. Quantity box.

11. Location and dimensions of headwall removal for RCB extensions.

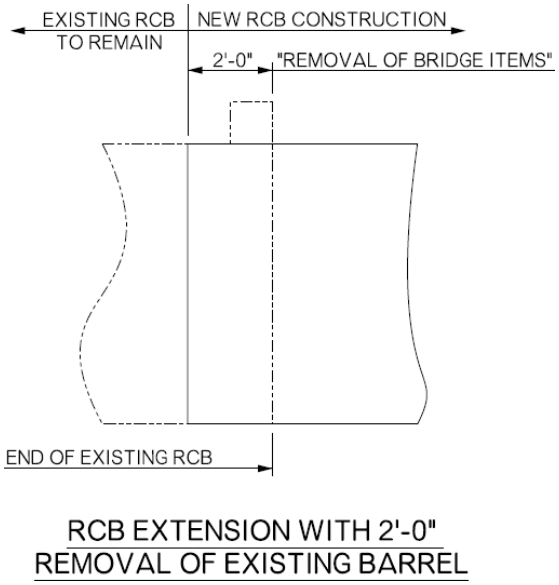


Figure 44. Removal of Existing Headwall Example
(2'-0" minimum removal shown; however, removal may be increased due to a damaged end section)

MISCELLANEOUS

1. The approved font is OkDOT. All text on the plan sheets shall be in capital letters. All dimensions, symbols or glyphs shall also be from OkDOT.ttf

2. Text size used on the plan sheet shall conform to the below:

   a. 120: Standard, dimension, notes, and bridge description.
   b. 140: Sub View, Sub Title, and note title (bold).
   c. 175: Titles, Views, emphasized text (typically underlined) (bold).
   d. 200: Sheet Name (bold).

3. Bridge Division Standard Cell Library's shall be used for details/call outs which are standardized.

4. Plan sheet dimension accuracy shall be to an 1/8", unless otherwise directed by the Design Engineer.

5. Sheet Information Rounding:

   a. Final stations, elevations and dimensions shall be rounded.
   b. Reinforcing bar lengths shall be rounded down to the nearest inch
   c. Drilled Shaft lengths are rounded up to the nearest foot.
   d. Reinforced concrete box barrel lengths shall be rounded to the next foot unless right-of-way or design requirements override this directive.

6. Sheet nomenclature:

   a. File Names shall be named as such: (do not use underbars, hyphens, or parentheses)
      i. 2710504 GENERAL PLAN AND ELEVATION.pdf
      ii. 2710504 404 APPLICATION.pdf
      iii. 2710504 BRIDGE PLAN SUBMISSION LETTER.pdf

   b. Sheet Numbers for Bridge Division Plan Sheets shall start with "B" followed by the sheet number.
      i. B001 (with the 1 increasing in sheet count)

   c. Bridge General Notes and Pay Quantity Sheets shall be numbered as such:
      i. AB01 (with the 1 increasing in sheet count)

   d. Title Sheets and Typical Section Sheets are to be numbered accordingly:
      i. 0001 (with the 1 increasing in sheet count)

7. The Index of Sheets Sheet Numbers shall be alphabetized.
The example below is a typical list of sheets that can be found on a bridge project. For a full list of possible sheet names, please see ODOT Projectwise Documentation.

0001	TITLE SHEET
0002	TYPICAL SECTION
AB01	GENERAL NOTES AND PAY QUANTITIES (BRIDGE)
AE01	ENVIRONMENTAL NOTES
AR01	GENERAL NOTES AND PAY QUANTITIES (ROADWAY)
AT01	GENERAL NOTES AND PAY QUANTITIES (TRAFFIC)
B001	BRIDGE DIVISION SHEETS
E001	ENVIRONMENTAL SHEETS
R001	ROADWAY DIVISION SHEETS
S001	SURVEY SHEETS
T001	TRAFFIC SHEETS
X001	CROSS SECTIONS

8. Drains at end of bridge details are required and shall be included at the end of the bridge plan sheets. These details shall clearly identify the locations and flow directions of drainage before and after the bridge.

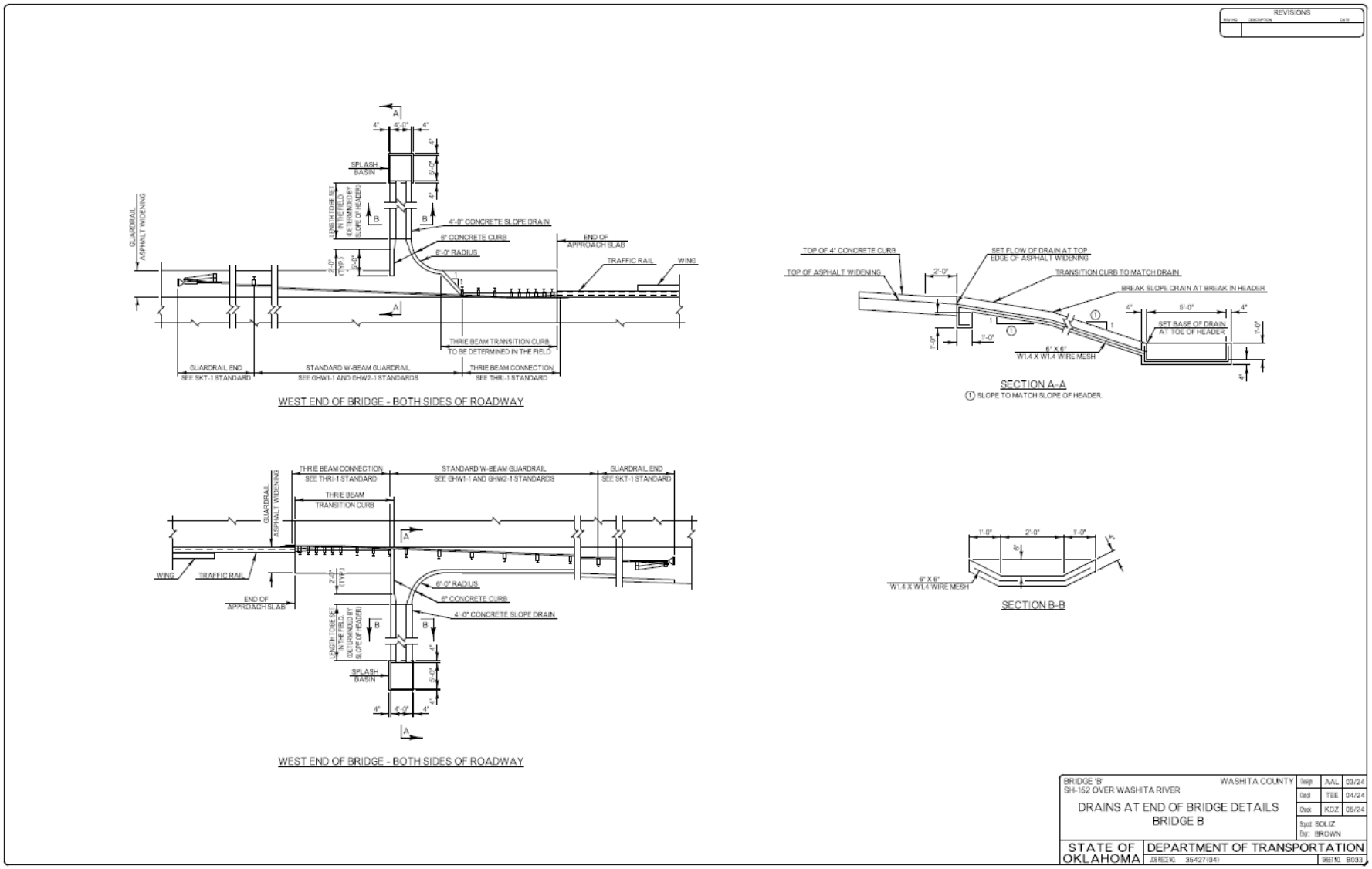


Figure 45. Drains at End of Bridge Example

QUANTITY ROUNDING POLICY

The following is the Bridge Division policy on rounding quantities during plan production. All quantities shown in the plans will reflect a rounded quantity.

Reinforcing Steel (All)	Up to next 10 LBS.
Structural Steel (All)	Up to next 10 LBS.
Filter Blanket (All)	Up to next 5 Tons
Riprap (All)	Up to next 10 Tons
Concrete Class A, Class AA, or Class C	Up to next 0.10 C.Y.
CLSM (Low Strength Backfill Material)	Up to next 0.10 C.Y.
Structural Excavation Unclassified	Up to next 1 C.Y.
Substructure Excavation Rock	Up to next 1 C.Y.
Pipe Underdrain Cover Material	Up to next 1 C.Y.
Trench Excavation	Up to next 1 C.Y.
Standard Bedding Material (All)	Up to next 1 C.Y.
Granular Backfill	Up to next 1 C.Y.
Unclassified or Select Borrow	Up to next 5 C.Y.
Substructure Excavation Common	Up to next 5 C.Y.
Clay Plating	Up to next 5 C.Y.
Unclassified Excavation	Up to next 10 C.Y.
Expansion Devices (All)	Up to next 0.10 L.F.
Prestressed Concrete Beam (All)	Up to next 0.10 L.F.
Bridge Railing (All)	Up to next 0.10 L.F.
Piling (All)	Up to next 1 L.F.
Drilled Shaft (All)	Up to next 1 L.F.
Pipe (All)	Up to next 1 L.F.
Sawcut Grooving	Up to next 1 S.Y.
Overlays	Up to next 1 S.Y. or 1 C.Y.
Elastomeric Mortar	Up to next 1 C.F.
Pneumatically Placed Mortar	Up to next 1 S.Y.

Rapid Cure Joint Sealant	Up to next 1 L.F.
Asphalt/Superpave Type Materials	Up to next 5 Tons
Mastic Asphalt/Wabocrete	Up to next 1 C.F.
Cold Milling/Hydrodemolition	Up to next 1 S.Y.
Carbon Fiber Reinforced Polymer	Up to next 1 S.F.
Polyurethane Injection (Foam Jacking)	Up to next 1 L.B.
Sealer Resin	Up to next 0.1 GAL
Sealer Crack Preparation	Up to next 1 L.F.
Epoxy Resin, Above Water	Up to next 0.1 GAL
Preparation of cracks, Above Water	Up to next 10 L.F.
Approach Slab	Up to next 0.10 S.Y.
Slope Wall	Up to next 1 S.Y.
Special Concrete Finish	Up to next 1 S.Y.
Removal of Pavement	Up to next 1 S.Y.
Removal of Existing Slab	Up to next 1 S.Y.
Sand Cushion	Up to next 1 S.Y.
Water Repellant (All)	Up to next 1 S.Y.
Class A Bridge Deck Repair	Up to next 10 S.Y.
Class B Bridge Deck Repair	Up to next 10 S.Y.
Class C Bridge Deck Repair	Up to next 5 S.Y.
Beam Type Guardrail (All)	Multiples of 12'-6"

ADA/TITLE VI INFORMATION

The Oklahoma Department of Transportation (ODOT) ensures that no person or groups of persons shall, on the grounds of race, color, sex, religion, national origin, age, disability, retaliation or genetic information, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any and all programs, services, or activities administered by ODOT, its recipients, sub-recipients, and contractors. To request an accommodation please contact the ADA Coordinator at 405-521-4140 or the Oklahoma Relay Service at 1-800-722-0353. If you have any ADA or Title VI questions email *ODOT-ada-titlevi@odot.org*.