Abutment

The ABUTMENT LAYOUT and ABUTMENT DETAIL sheets provide specific details for the bridge abutment. Additional details such as abutment drainage, bearing pad layout, utility locations, retaining wall connections, and other abutment-related details may be shown on these sheets.

Plan

1. Place at the top, left side of sheet, oriented with the front side facing down and the centerline of abutment horizontal. Alternatively, the PLAN view may be orientated the same direction as the PLAN view shown on the GENERAL PLAN sheet.

2. The minimum scale is ¼” = 1'-0”. Use ⅛” = 1'-0” on large structures but show less detail.

3. Show abutment, footing, pile spacing, bearing pad, and wingwall dimensions along the same layout lines used on the FOUNDATION PLAN (Note: Show the centerline of the abutment bearing for seat abutments and the centerline of the abutment for diaphragm abutments).

4. Do not repeat layout stations or bearings shown on the FOUNDATION PLAN.

5. Show wingwall or retaining wall lengths.

6. Show pile spacing (Do not dimension piles from edge of footing).
   - A FOOTING PLAN may be used to show pile spacing if it can’t be shown clearly in the PLAN view. Additional DETAILS of footings should be shown in the same orientation as the PLAN view. Show the centerline of bearing.

7. Show North arrow.

8. Show bearing pads and limits of level bearing area. A portion of the expanded polystyrene or expansion joint filler material may be added.


10. Avoid showing portions of approach slabs or reinforcement.
Elevation

1. Place below PLAN view, projected from face of abutment. If PLAN is orientated the same as the GENERAL PLAN, place ELEVATION in front of PLAN, looking normal to face of abutment.

2. Use solid lines for portions below grade. Rear elevations should be avoided. ELEVATION should be a depiction of abutment stem, backwall, and footing. Avoid showing the superstructure on seat type abutments, but if it is shown – use dashed lines.

3. Use the same scale as PLAN view.

4. Show location of weep holes if Structure Approach Drainage is not required. For typical drainage details, see Standard Plan B0-3: Bridge Detail 3-1.

5. Show the finished grade or slope paving in front of the abutment (FG should be parallel to the deck when the cross slope is constant and level for crowned slopes).

6. Do not attempt to show the entire skewed wingwalls.

7. Show bearing pads and utility opening information.

8. Do not show all piles (NOTE: All piles not shown).

9. Avoid showing barrier, approach slab, or other detail dimensions.

Wingwall Elevation

1. Projection of PLAN view, if possible; otherwise locate by VIEW letters or simply call out as WINGWALL ELEVATION.

2. Always show looking normal to the wall.

3. Use the same scale as PLAN view unless reinforcement is to be shown. Usually, reinforcement should not be shown at a scale less than 1/8" = 1'-0".

4. Do not show wingwall layout dimensions given on PLAN view. Call out Standard Plan references instead of re-detailing standard reinforcement.

5. Show SECTION of top of wall details for railings, sidewalks, overhangs, and architectural treatment. Section should show Structure Approach Drainage Details if applicable.

6. Show finished grade or slope paving.

7. Show all piles.

8. Railing need not be shown (NOTE: Barrier railing not shown).
Retaining Wall or Return Wall Elevation

1. Do not show dimensions given on PLAN view or standard plan sheets. Call out Standard Plan references (e.g., footing steps, expansion joints, weakened planes, etc). Show all other layout information along the Retaining Wall Layout Line (RWLOL).

2. Long retaining walls adjacent to bridges may require separate sheets or plans showing PLAN and ELEVATION details.

3. Show SECTION of top of wall details for railings, sidewalks, overhangs, and architectural treatment. Section should show Structure Approach Drainage Details if applicable.

4. Do not show all piles (NOTE: All piles not shown).

5. Distance between footing steps should be in multiples of 8 feet. Maximum height of steps should be held to 4 feet. For typical step details, see Standard Plan B3-5: Retaining Wall Details No. 1 - Footing Step. Small steps less than 12 inches should be avoided unless distance between steps is 96 feet or more. If footing thickness changes between steps, the bottom of footing elevation should be adjusted so that the top of footing remains at the same elevation.

6. When sloping footings are used, form and joint lines are permitted to be perpendicular and parallel to the footing for ease of construction. Sloping footing grades shall be constant for the entire length of the wall. If breaks in footing grade (angle points) are deemed necessary, a level-stepped footing shall be used for the entire wall instead of a sloping footing (Maximum permissible slope for a reinforced concrete retaining wall footing is 3% and maximum permissible slope for masonry walls is 2%).

7. Weakened plane joints (Standard Plan B0-3: Bridge Detail 3-2) should be shown at nearly equal spaces between expansion joints.

8. Expansion Joints (Standard Plan B0-3: Bridge Detail 3-4) shall be shown at maximum intervals of 96 feet (shorter spaces should be in multiples of 8 feet). Expansion joints should not be placed at an angle point in the wall alignment. Waterstop in the expansion joint shall be shown to extend 1 foot below the finished grade. When concrete barriers or curbs are used on top of the retaining walls, the waterstop in the expansion joint shall be shown to extend 6 inches into the barrier or curb.
Sections and Details

1. For general requirements, see *Bridge Design Details*: 1.1 General Detailing - Detail Layout, Sections, and Views.

2. SECTIONS and DETAILS showing reinforcement should not be less than \( \frac{3}{8}'' = 1'-0'' \) scale; the preferred scale is \( \frac{1}{2}'' = 1'-0'' \) minimum.

3. Do not repeat reinforcement shown in the Standard Plans.

4. Abutment SECTION should include the following:
   a) Location of Beginning of Bridge (BB) and End of Bridge (EB), see *Bridge Design Details*: 6.8 BB and EB Locations.
   b) Centerline Bearing for seat type abutment and Centerline Abutment for diaphragm type.
   c) Stem and backwall reinforcement. For post tensioned girder bridges, backwall to be placed after bridge has been stressed.
   d) Footing reinforcement and pile spacing.
   e) Outline of end diaphragm or superstructure (Do not use drop out lines or include reinforcement details of superstructure beyond bars that extend from end diaphragm abutment into deck).
   f) Joint seal type, movement range, and joint seal blockout details.
   g) Waterstop or Structure Approach joint detail, see *Bridge Design Details*: 6.7 Sealed Joints.
   h) Drainage details behind the abutment and “Weep Hole and Geocomposite Drain Detail” alternative when *Standard Plan B0-3*: Detail 3-1 is shown. For more information, see *Bridge Design Details*: 6.3 Abutment Drainage Details.
      - Edit the NOTES in the “Weep Hole and Geocomposite Drain Detail” to remove references to wall types or elements that are not specific to the project plans.
   i) Dimension distance below the soffit and width of maintenance berm. For additional berm information, see *Bridge Design Details*: 2.1 Bridge Layout and *Bridge Design Details*: 6.2 Seat & End Diaphragm Abutments.

5. SHEAR KEY DETAIL should include the following:
   a) Expanded polystyrene and expansion joint filler details.
   b) Shear Key, stem, and wingwall reinforcement.
Figure 6A.A.1 Abutment Layout Detailing Example 1
Figure 6A.3 Abutment Layout Detailing Example 3
Figure 6A.4.4 Abutment Details Example
Figure 6A.5 Abutment Details Example 5
Figure 6A.A.6 Abutment Layout Detailing Example 6
Figure 6A.7 Abutment Layout Detailing Example 7
Figure 6A.A.8 Abutment Layout Detailing Example 8
Figure 6A.A.9 Abutment Details Detailing Example 9
Figure 6A.A.12 Abutment Retaining Wall Details Detailing Example 12

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NOTES:
1. Reinforcement shown is to be placed in addition to that shown for spread footing on Standard Plan 83-1A.
2. $\phi$ and $\phi$ bars only required on exterior piles. Interior piles require to be reinforced 1 way.
3. Reinforcement groups shall be centered on associated piles.
4. Placing not shown, see pile layout on ABUTMENT 8 RETAINING WALL LAYOUT NO. 1 and ABUTMENT 8 RETAINING WALL LAYOUT NO. 2 sheets.

PILE FOOTING DETAIL
NO SCALE

NOTICE:
- For Retaining Wall reinforcement details, see Standard Plan 83-1A.
- For location of "DETAIL 4", see "ABUTMENT 1 DETAILS" and "ABUTMENT 8 RETAINING WALL LAYOUT No. 1 sheets.
- Curved dimension may vary to achieve finished profile.
- Epoxy-coated reinforcement

DETAIL 6A.A.12

$N = 1'-0"$
Figure 6A.A.13 Abutment Layout Detailing Example 13

NOTE:
1. Backfill shall be placed simultaneously behind and in front of each abutment up to the level of finished grade at the front face of abutment.
   Adequate drainage shall be provided to prevent any movement of the abutment.

2. For "SECTION B-B", "DETAIL K", "STEEL PILE ANCHOR" details and "BEAD HOLE AND DECOMPOSITE BEAM" alternative, see ABUTMENT DETAILS sheet.

   Epoxy-coated reinforcement
Figure 6A.A.14 Abutment Details Detailing Example 14

**NOTES:**
1. #8 drain or Intermediate cap points and #8 PVC drain pipe to center, exposed wall drain shall be located 6" above finished grade.
2. Geocomposite drain to be installed prior to backfill. A 2" drainage break shall be placed behind the back of the #8 drain pipe. A "T" Tee connection or each #8 drain.

**ALTERNATIVE TO BRIDGE DETAIL 6A.A.14B:**

**NEE普 HOLE AND GEODECOMPOSITIVE DRAIN DETAIL**

**SECTION B-B**

**NOTE:**
1. For location of "SECTION B-B" and "DETAIL X," see "ABUTMENT LAYOUT" sheet.
   + Epoxy-coated reinforcement
Figure 6A.A.15 Abutment Layout Detailing Example 15

Notes:
1. 4" W drain on permeable soil. Joins at one point and 2" maximum center.  
   3. Plastic drain pipe continues behind abutment. Cop ends on pipe. Provide "tee"  
   pipe connection at each 4" outlet.  

Weep Hole and Geocomposite Drain Detail
Figure 6A.A.16 Abutment Layout Detailing Example 16
Figure 6A.A.18 Abutment Layout Detailing Example 18

### Plan

- **PLAN**
  - W:\1-40

### Notes

1. For "SECTION A-A", "SECTION C-C", and "DETAIL C", see "ABUTMENT DETAILS No. 2" sheet.
2. For "SECTION P-P" & "SECTION U-U", see "ABUTMENT DETAILS No. 5" sheet.
3. For "DETAIL P", see "ABUTMENT DETAILS No. 5" sheet.
4. For "DETAIL C" & "DETAIL D", see "ABUTMENT DETAILS No. 1" sheet.
5. For "DETAIL M", see "ABUTMENT DETAILS No. 3" sheet.
6. For "DETAIL C", see "ABUTMENT DETAILS No. 1" sheet.
7. For "DETAIL P", see "ABUTMENT DETAILS No. 5" sheet.
8. For "WEAP HOLE and DECOMPOSITE DRAYE ALTERNATIVE", see "ABUTMENT DETAILS No. 3" sheet.
9. Existing girders and barriers not shown.

### Details

- **ELEVATION**
  - **W:\1-40**

**Case Note:**

The contractor shall verify all expansion joint positions and bonding of fabricated and fabricated any material.

**Legend:**

- Bridge Removal (Portion)
- Existing structure
- Girder designation
- Epoxy coated reinforcement

**SECTIONS:**

- **SECTION N-N**
  - W:\1-40
- **SECTION O-O**
  - W:\1-40
Figure 6A.18 Abutment Details Detailing Example 19
Figure 6.2.1 Abutment Foundation Embedment and Berm
Notes:

1. For Abutment reinforcement, see *Bridge Design Aids*: Section 1 Abutments.

2. The clearance between the top of finish grade slope and the soffit of the bridge should be 3'-0" minimum for abutments with a berm. This clearance allows room for compaction of the berm and for future maintenance inspections. If, for some reason, the berm is wider than 6'-0", the minimum vertical clearance provided should be increased to provide the necessary room for construction. The clearance may be as little as 2'-0" for abutments without a berm (with slope paving); whereas the clearance can be as much as 4'-0" for typical bridges, depending upon individual project circumstances. Bridges with structure depths greater than 7'-0" would typically have more clearance, than the typical dimensions shown above, to provide a similar appearance as the shallower structures. The clearance is parallel to the deck when the cross slope is constant and level for crown slopes. The dimension shall be shown on the plans.

3. The bottom portion of abutments on piles without footings, shall be embedded a minimum of 3'-6" at the face of abutment when there is no berm (with slope paving). If the slope is flatter than 1½:1 (horizontal:vertical), the embedment can be decreased to as little as 2'-0".

4. For abutments on spread footings, the horizontal clearance from the top of footing to the face of slope should be 5'-0" minimum, with a 2'-0" minimum cover at the edges of footing.

5. Front face slopes at abutments should be 1½ to 1 or flatter, except under very unusual circumstances.
Bridge Design Details 6.3 February 2020

Abutment Drainage Details

Figure 6.3.1 Abutment Drainage
Figure 6.3.2 Weep Hole and Geocomposite Drain Alternative
Notes:

1. Continuous pervious backfill material (Standard Plan B0-3: Bridge Detail 3-1), structure approach drainage (Standard Plan B9-6: Structure Approach Drainage Details), or perforated pipe with permeable material (Standard Plan B0-3: Bridge Detail 3-5) should be placed in accordance with the instructions in Memo to Designers: 5-2 Diaphragm Abutments. Permeable material (Standard Plan B0-3: Bridge Detail 3-5), is only specified when known water bearing material is present behind the abutment as identified in the Foundation Report.

2. For all abutments (without structure approaches) and for retaining walls, the “Weep Hole and Geocomposite Drain Detail”, shown in Figure 6.3.2, shall be added to the plans. This detail provides an alternative detail to the pervious backfill specified in Standard Plan B0-3: Bridge Detail 3-1. The plans should show the pervious material and not the alternative geocomposite drain in the abutment or retaining wall sections. Edit the NOTES in the “Weep Hole and Geocomposite Drain Detail” to remove references to wall types or elements that are not specific to the project plans.

3. Reference ROADWAY PLANS or show drainage outlet details behind the abutment whenever possible.
Bridge Design Details 6.4 February 2020

Pile Footings

**CONCRETE PILES**

**STEEL PILES**

Figure 6.4.1 Pile Footings
Notes:

1. Battered pile at this location is unnecessary. Pile should be vertical.
2. Use vertical pile rather than battered piles at sharp acute corners where it may be difficult to drive battered piles.
Bearing Pad Location at Anchorage Blockout

Figure 6.6.1 Bearing Pad Location at Anchorage Blockout
Bridge Design Details 6.7 February 2020

Sealed Joints

Figure 6.7.1 Sealed Joints (MR ≤ 2”)

Figure 6.7.2 Joint Seal Assemblies (MR > 2½”)

Sealed Joints
Figure 6.7.3 Joint Seal Protection Detail (MR > 2½")

Note: "DETAIL D" must be shown in the plans for bridges with Standard Plan structure approach slabs with joint MR > 2". Show only the applicable portion of the detail that covers the actual joint MR range of the bridge.
Bridge Design Details 6.8 February 2020

BB and EB Locations

Figure 6.8.1 Diaphragm Abutment BB and EB Locations

Figure 6.8.2 Seat Abutment BB and EB Locations
Cantilever Wingwalls

* Normally 8'-0", but may be reduced to 5'-0" for structures in a cut or minor structure which is less than 50'-0" long, see Bridge Design Aid 10-33 Slopes at Abutments.

**Figure 6.9.1 Minimum Soil Cover**

**Figure 6.9.2 Seat Abutment with Standard Plan Wingwall**
Notes:

1. Preferred step dimensions shown, may vary to fit slope conditions or pile spacings. For additional information refer to Standard Plan: B3-5 Retaining Wall Details No. 1.

2. Extend waterstop 6 inches into concrete barrier or curb.
Bridge Design Details 6.11 February 2020

Abutment Wingwall Corners

Tension reinforcement shall not be bent around a re-entrant corner of an acute abutment. The small amount of concrete cover is not sufficient to keep the reinforcing from straightening.

**INCORRECT**

Figure 6.11.1 Abutment Wingwall Corners

Reinforcement in each face should be straight and extend the required development length after it crosses the bar from the other direction. Standard practice for detailing reinforcement in all corners and angle changes in members is shown below.

**CORRECT**

Figure 6.11.2 Abutment Wingwall Corners
Bridge Design Details 6.12 February 2020

Barriers on Walls

When a barrier or bridge railing is to be placed on a wingwall or retaining wall, the wall must be detailed to alert the contractor of the additional work to be performed. This information is shown on the barrier Standard Plan or on the specific XS-SHEET details and must be referenced in the plans. The details below illustrate the minimum additional detail required for a standard plan concrete barrier. Details for Standard Plan barriers with a curb are similar.

Figure 6.12.1 Concrete Barrier on Walls
Edge Distance Calculation for Bearing Pad

Figure 6.13.1 Bearing Layout

Formulas:

\[ Y = V + \frac{a}{2}\cos\alpha + \frac{b}{2}\sin\alpha \]
\[ X = U + \frac{a}{2}\sin\alpha + \frac{b}{2}\cos\alpha \]
\[ y = V + y_1 + y_2 \]
\[ y_1 = \frac{a}{2}\cos\alpha \]
\[ y_2 = \frac{b}{2}\sin\alpha \]
\[ x = U + y_1 + y_2 \]
\[ x_1 = \frac{a}{2}\sin\alpha \]
\[ x_2 = \frac{b}{2}\cos\alpha \]
Example:  10" x 22" Bearing Pad (a = 10", b = 22")
Minimum Skew Angle (α) = 27° 10’ 30"
Clearance (U = 3", V = 3")

Calculate:  
\[ Y = 3'' + \frac{10''}{2} \times (0.8896) + \frac{22''}{2} \times (0.4567) \]
\[ Y = 3'' + 4.45'' + 5.02'' = 12.47'', \text{ use } 12\frac{1}{2}'' \text{ minimum} \]

\[ X = 3'' + \frac{10''}{2} \times (0.4567) + \frac{22''}{2} \times (0.8896) \]
\[ X = 3'' + 2.28'' + 9.78'' = 15.06'', \text{ use } 15'' \text{ minimum} \]
Abutment - Checklist

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Plan

☐ 1. Place at the top, left side of sheet, oriented with the front side facing down and the centerline of abutment horizontal. Alternatively, the PLAN view may be orientated the same direction as the PLAN view shown on the GENERAL PLAN sheet.

☐ 2. The minimum scale is ¼" = 1'-0". Use ⅛" = 1'-0" on large structures, but show less detail.

☐ 3. Show abutment, footing, pile spacing, bearing pad, and wingwall dimensions along the same layout lines used on the FOUNDATION PLAN (Note: Show the centerline of the abutment bearing for seat abutments and the centerline of the abutment for diaphragm abutments).

☐ 4. Do not repeat layout stations or bearings shown on the FOUNDATION PLAN.

☐ 5. Show wingwall or retaining wall lengths.

☐ 6. Show pile spacing (Do not dimension piles from edge of footing).

☐ A FOOTING PLAN may be used to show pile spacing if it can’t be shown clearly in the PLAN view. Additional DETAILS of footings should be shown in the same orientation as the PLAN view. Show the centerline of bearing.

☐ 7. Show North arrow.

☐ 8. Show bearing pads and limits of level bearing area. A portion of the expanded polystyrene or expansion joint filler material may be added.


☐ 10. Avoid showing portions of approach slabs or reinforcement.
Elevation

1. Place below PLAN view, projected from face of abutment. If PLAN is orientated the same as the GENERAL PLAN, place ELEVATION in front of PLAN, looking normal to face of abutment.

2. Use solid lines for portions below grade. Rear elevations should be avoided. ELEVATION should be a depiction of abutment stem, backwall, and footing. Avoid showing the superstructure on seat type abutments, but if it shown – use dashed lines.

3. Use the same scale as PLAN view.

4. Show location of weep holes if Structure Approach Drainage is not required. For typical drainage details, see Standard Plan B0-3: Bridge Detail 3-1.

5. Show the finished grade or slope paving in front of the abutment (FG should be parallel to the deck when the cross slope is constant and level for crowned slopes).

6. Do not attempt to show the entire skewed wingwalls.

7. Show bearing pads and utility opening information.

8. Do not show all piles (NOTE: All piles not shown).

9. Avoid showing barrier, approach slab, or other detail dimensions.

Wingwall Elevation

1. Projection of PLAN view, if possible; otherwise locate by VIEW letters or simply call out as WINGWALL ELEVATION.

2. Always show looking normal to the wall.

3. Use the same scale as PLAN view unless reinforcement is to be shown. Usually reinforcement should not be shown at a scale less than \( \frac{3}{8}'' = 1'\text{-}0'' \).

4. Do not show wingwall layout dimensions given on PLAN view. Call out Standard Plan references.

5. Show SECTION of top of wall details for railings, sidewalks, overhangs, and architectural treatment. Section should show Structure Approach Drainage Details if applicable.

6. Show finished grade or slope paving.

7. Show all piles.

8. Railing need not be shown (NOTE: Barrier railing not shown).
Retaining Wall or Return Wall Elevation

1. Do not show dimensions given on PLAN view or standard plan sheets. Call out Standard Plan references (i.e. footing steps, expansion joints, weakened planes, etc). Show all other layout information along the Retaining Wall Layout Line (RWLOL).

2. Long retaining walls adjacent to bridges may require separate sheets or plans showing PLAN and ELEVATION details.

3. Show SECTION of top of wall details for railings, sidewalks, overhangs, and architectural treatment. Section should show Structure Approach Drainage Details if applicable.

4. Do not show all piles (NOTE: All piles not shown).

5. Distance between footing steps should be in multiples of 8 feet. Maximum height of steps should be held to 4 feet. For typical step details, see Standard Plan B3-5: Retaining Wall Details No. 1 - Footing Step. Small steps less than 12 inches should be avoided unless distance between steps is 96 feet or more. If footing thickness changes between steps, the bottom of footing elevation should be adjusted so that the top of footing remains at the same elevation.

6. When sloping footings are used, form and joint lines are permitted to be perpendicular and parallel to the footing for ease of construction. Sloping footing grades shall be constant for the entire length of the wall. If breaks in footing grade (angle points) are deemed necessary, a level-stepped footing shall be used for the entire wall instead of a sloping footing (Maximum permissible slope for a reinforced concrete retaining wall footing is 3% and maximum permissible slope for masonry walls is 2%).

7. Weakened plane joints (Standard Plan B0-3: Bridge Detail 3-2) should be shown at nearly equal spaces between expansion joints.

8. Expansion Joints (Standard Plan B0-3: Bridge Detail 3-4) shall be shown at maximum intervals of 96 feet (shorter spaces should be in multiples of 8 feet). Expansion joints should not be placed at an angle point in the wall alignment. Waterstop in the expansion joint shall be shown to extend 1 foot below the finished grade. When concrete barriers or curbs are used on top of the retaining walls, the waterstop in the expansion joint shall be shown to extend 6 inches into the barrier or curb.
Sections and Details

1. For general requirements, see *Bridge Design Details*: 1.1 General Detailing - Detail Layout, Sections, and Views.

2. SECTIONS and DETAILS showing reinforcement should not be less than $\frac{3}{8}" = 1'-0"$ scale; the preferred scale is $\frac{1}{2}" = 1'-0"$ minimum.

3. Do not repeat reinforcement shown in the Standard Plans.

4. Abutment SECTION should include the following:
   a) Location of Beginning of Bridge (BB) and End of Bridge (EB), see *Bridge Design Details*: 6.8 BB and EB Locations.
   b) Centerline Bearing for seat type abutment and Centerline Abutment for diaphragm type.
   c) Stem and backwall reinforcement. For post tensioned girder bridges, backwall to be placed after bridge has been stressed.
   d) Footing reinforcement and pile spacing.
   e) Outline of end diaphragm or superstructure (Do not use drop out lines or include reinforcement details of superstructure beyond bars that extend from end diaphragm abutment into deck).
   f) Joint seal type, movement range, and joint seal blockout details.
   g) Waterstop or Structure Approach joint detail, see *Bridge Design Details*: 6.7 Sealed Joints.
   h) Drainage details behind the abutment and “Weep Hole and Geocomposite Drain Detail” alternative when *Standard Plan B0-3*: Detail 3-1 is shown. For more information, see *Bridge Design Details*: 6.3 Abutment Drainage Details.
      Edit the NOTES in the “Weep Hole and Geocomposite Drain Detail” to remove references to wall types or elements that are not specific to the project plans.
   i) Dimension distance below the soffit and width of maintenance berm. For additional berm information, see *Bridge Design Details*: 2.1 Bridge Layout and *Bridge Design Details*: 6.2 Seat & End Diaphragm Abutments.

5. SHEAR KEY DETAIL should include the following:
   a) Expanded polystyrene and expansion joint filler details.
   b) Shear Key, stem, and wingwall reinforcement.
Figure 6A.B.1 High Cantilever Abutment on Spread Footing Details
### HIGH CANTILEVER ABUTMENT ON SPREAD FOOTING INFORMATION

NOTE: The following information is to only be used for initial abutment design sizing and planning study assumptions. Final design of abutments shall be based on current Bridge Design Specifications.

#### APPLIED SUPERSTRUCTURE LOAD IN KIPS PER FT.

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#### QUANTITIES

- **Bar Reinforcing Steel (lbs./ft.)**
- **Applied Superstructure Load**

**NOTE:** For walls with more than 7'-0" high, the concrete quantity shall be increased by 2% per foot of variation.
Figure 6A.B.3 High Cantilever Abutment on Pile Footing Details
### Figure 6A.B.4 High Cantilever Abutment on Pile Footing Information

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**Note:** The values of "H" given are maximum values. Where only values of "A" are listed, these values are total pile gages. Where both values of "A" and "H" are listed, these values are the net pile gages.

For other pile loadings obtain the required spacing by proportion, for example: allowable pile loading 60 tons, multiply values of "A" and "H" in the table by 60/45.

---

**Pile Loadings for Abutment Footings**

**Number of Single Spans:**
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
- 16
- 17
- 18
- 19
- 20

**Number of Single Spans (cont.)**
- 21
- 22
- 23
- 24
- 25
- 26
- 27
- 28
- 29
- 30
- 31
- 32
- 33
- 34
- 35
- 36
- 37
- 38
- 39
- 40

**Number of Single Spans (cont.)**
- 41
- 42
- 43
- 44
- 45
- 46
- 47
- 48
- 49
- 50
- 51
- 52
- 53
- 54
- 55
- 56
- 57
- 58
- 59
- 60

---

**Table Notes:**

- **A** values are given in feet.
- **H** values are given in feet.
- **H** values are not applicable to pile gages.
- **A** values are applicable to pile gages.

---

**Table Example:**

- For **60 tons** of load, multiply values of **"A"** and **"H"** in the table by **60/45**.

---

**Bridge Reinforcement Requirements:**

- **Total Quantities:**
  - Steel (in.²) including the total quantity of steel for abutment and footing.