<table>
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<tr>
<th>CELL / MODEL NAME</th>
<th>DESCRIPTION</th>
<th>DATE</th>
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<tr>
<td>A-1</td>
<td>Pile stub abutment no skew</td>
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<tr>
<td>A-1-D</td>
<td>Pile stub abutment details</td>
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<tr>
<td>A-1-DSD</td>
<td>Pile stub abutment details with drilled shafts</td>
<td>1/27/2012</td>
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<tr>
<td>A-1-L (greater than 30 degree skew)</td>
<td>Pile stub abutment ahead left (&gt; 30 degree skew)</td>
<td>1/27/2012</td>
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<tr>
<td>A-1-L (less than 30 degree skew)</td>
<td>Pile stub abutment ahead left (&lt; 30 degree skew)</td>
<td>7/1/2010</td>
</tr>
<tr>
<td>A-1-R (greater than 30 degree skew)</td>
<td>Pile stub abutment ahead right (&gt; 30 degree skew)</td>
<td>1/27/2012</td>
</tr>
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<td>A-1-R (less than 30 degree skew)</td>
<td>Pile stub abutment ahead right (&lt; 30 degree skew)</td>
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<tr>
<td>AD-11-0</td>
<td>Abutments for 11 inch deck beams, no skew</td>
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<tr>
<td>AD-11-L</td>
<td>Abutments for 11 inch deck beams, ahead left skew</td>
<td>7/1/2010</td>
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<td>AD-11-R</td>
<td>Abutments for 11 inch deck beams, ahead right skew</td>
<td>7/1/2010</td>
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<tr>
<td>AD-1721-0</td>
<td>Abutments for 17&quot; or 21&quot; deck beams, no skew</td>
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<tr>
<td>AD-1721-L</td>
<td>Abutments for 17&quot; or 21&quot; deck beams, ahead left skew</td>
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<td>AD-1721-R</td>
<td>Abutments for 17&quot; or 21&quot; deck beams, ahead right skew</td>
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<td>AD-2742-R</td>
<td>Abutments for 27&quot;, 33&quot;, or 42&quot; deck beams, ahead right skew</td>
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<tr>
<td>AI-2440-0</td>
<td>Integral abutment; 24-40 inch depth beams; No skew</td>
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<td>Integral abutment; 24-40 inch depth beams; Left skew</td>
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<td>Integral abutment; 24-40 inch depth beams; Right skew</td>
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<td>AI-2440S-0</td>
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<td>Solid straight stem pier</td>
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<td>Three column pier</td>
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<td>Multiple column pier</td>
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<td>Trapezoidal pier</td>
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<td>Single hammerhead pier (modified)</td>
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<td>Two column trapezoidal pier</td>
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<td>Four column pier (over railroad)</td>
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<td>Six column pier (over railroad)</td>
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<td>Drilled shaft pier</td>
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<td>Drilled shaft pier with crashwall</td>
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<td>P-DSSW</td>
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<td>P-DSTB</td>
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<td>Drilled shaft pier with webwall</td>
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<td>PB-1</td>
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<td>PC-1</td>
<td>Solid straight stem pier with cap</td>
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Bill of Material

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<tr>
<td>4</td>
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</table>

**Abutment**

- #4 v(E) bars at 12" cts.
- #5 v(E) bars at 12" cts.
- #6 v(E) bars at 12" cts.
- #7 v(E) bars at 12" cts.

**Abutment Details**

- Concrete Encasement, typ.
- Encasement, typ.
- Concrete Structures
- Epoxy Coated Reinforcement Bars, typ.

**Structure Excavation**

- Driving Piles
- Test Piles

**Concrete Sealer**

- Furnishing - Piles, Foot

**Details**

- For details of pile sizes and Concrete Encasement, see sheet - of -.
- For details of Bar Splicers, see sheet - of -.
Notes:
- Hatched areas to be poured after superstructure false work has been removed.
- Quantity of concrete included with Concrete Superstructure.
- Space reinforcement in cap to miss anchor bolts.
- Pour steps monolithically with cap.
- Quantity of concrete in cap and cap included with Concrete Superstructure on sheet - of -.
- For Concrete Encasement details, see sheet - of -.

For Concrete Encasement details, see sheet - of -.
BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Bar Type</th>
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<td>#6</td>
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<td>#6</td>
<td>#6</td>
<td>#6</td>
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<tr>
<td>s(E)</td>
<td>#4</td>
<td>#4</td>
<td>#6</td>
</tr>
<tr>
<td>v(E)</td>
<td>#6</td>
<td>#4</td>
<td>#6</td>
</tr>
</tbody>
</table>

For details of the Splices, see sheet - of -.
For details of Bar Splicers, see sheet - of -.

PILE DATA

- Type: Encasement, typ.
- Nominal Required Bearing: Stiff.
- Test Piles: Each
- Production Piles: See Sec. thru Abut.
- Est. Length: 5
- Factored Resistance Available: See Sec. thru Abut.
- Nominal Required Bearing: See Sec. thru Abut.
**ELEVATION**

- #5 v(E) bars at 12'' cts. Each Face
- #5 v(E) bars at 12'' cts. Each Face
- #5 v(E) bars

**PLAN**

- #4 v(E) bars at 12'' cts.
- #4 v(E) bars at 12'' cts.
- #4 v(E) bars at 12'' cts.

**PILE DATA**

- Type: Permanent
- No. Required: 10
- Factored Resistance Available: 200
- Est. Length: 100
- Nominal Required Bearing: 200
- Type: Skew

**FIELD CUTTING DIAGRAM**

- #6 v(E) bars
- #6 v(E) bars
- #6 v(E) bars

**BILL OF MATERIAL**

- Pile Caps
- Concrete Encasement
- Driving Piles
- Test Pile, Foot
- Concrete Structures
- Concrete Encasement
- Epoxy Coated Reinforcement Bars
- Driving Piles
- Test Pile, Foot

- For details of piles and concrete encasement, see sheet - of -.
**PILE DATA**

- Type: Dimensions Required/Deformation, Factual Resistance Available
- Est. Length, Nominal Production Piles, No. Test Piles

**BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>Bar</th>
<th>No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
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<tr>
<td>v(E)</td>
<td>10</td>
<td>8</td>
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</tbody>
</table>

**FIELD CUTTING DIAGRAM**

- Bars h(E) & s(E):
- Bar p(E):
- Bar v(E):
- Bar u(E):

**PLANT**

- Cast top of wingwall flush with exterior beam face after beams have been erected.
- Cast top of wingwall flush with beam face after beams have been erected.
- Cast top of wingwall flush with exterior beam face after beams have been erected.

**ELEVATION**

- Bend in field as required
- Bend in field as required
- Bend in field as required

**SECTION A-A**

- Dimensions are at Rt. 's

**STRUCTURE NO.**

- Structure Excavation

**STATE OF ILLINOIS**

- Department of Transportation

**FILE NAME**

- User Name

**PLOT SCALE**

- PLOT DATE

**CHECKED**

- DRAWN

**DEPARTMENT OF TRANSPORTATION**

- State of Illinois

**CONTRACT NO.**

- Federal Aid Project

**TOTAL SHEETS**

- Sheets
**PILE DATA**

Type: Normal Required Bearing
Factored Resistance Available
Est. Lengths
No. Production Piles
No. Test Piles

**BILL OF MATERIAL**

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<tr>
<th>Material</th>
<th>Description</th>
<th>Unit</th>
<th>Quantity</th>
<th>Size</th>
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<tr>
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<td>Full length</td>
<td>5</td>
<td>8</td>
<td>#5</td>
</tr>
<tr>
<td>p(E) bars</td>
<td>Full length</td>
<td>10</td>
<td>4</td>
<td>#6</td>
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</tbody>
</table>

**FIELD CUTTING DIAGRAM**

Order v(E) bars full length. Cut as shown and use remainder of bars in opposite face.

**SECTION A-A**

For details of piles and Concrete Encasement, see sheet - of -.

- E Abut., typ.
- 1" cl.
- and Piles
- typ.
- 2" cl.
- 1'-0'
- Rdwy.
- Elev.
- Elev.

**ELEVATION**

- p(E) bars
- See Sec. Thru Abut.
- t(E) bars
- Each face
- h(E) bars
- h(E) bars
- v(E) bars
- v(E) bars
- each side
- h(E) bars
- (See Field Cutting Diagram)
**ELEVATION**

- Cast top of wingwall flush with exterior beam after beams have been erected.

**PLAN**

- Bend in field as required
- Fan #5 v(E) bars at Each Face
- Each End

**BILL OF MATERIAL**

- For details of piles and Concrete Encasement, see steel - of -.

**PILE DATA**

- Nominal Required Bearing
- Factored Resistance Available
- No. Test Piles:
- No. Production Piles:
- Est. Length:
- Type:
- Skew °

**FIELD CUTTING DIAGRAM**

- Order #5 v(E) bars full length - Cut as shown and use remainder of bars in opposite face.
ELEVATION

PLAN

PILE DATA

FIELD CUTTING DIAGRAM

BILL OF MATERIAL

AD-1721-R

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BILL OF MATERIAL

AD-1721-R

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
PILE DATA

Elev. Elevation Plane

BILL OF MATERIAL

FIELD CUTTING DIAGRAM

Notes:
- For details of piles and concrete encasement, see sheet - of -.
- Cast backwall after beams and concrete wearing surface, if applicable, have been erected.
Elevation:

- Cast top of wingwall flush with exterior face. Cast backwall after beams have been erected.
- Cast top of concrete beam face after beams have been erected. Cast top of wingwall flush with exterior face, if applicable, have been erected.

Plan:

- See Section Thru Abut.
- Const. joint Mandatory.
- Const. joint Mandatory.
- Bars at 2'-6" cts., typ.
- Bars at 2'-6" cts.
- Bars at 2'-6" cts.
- Bars at 1'-8" cts.
- Bars at 12" cts.

Field Cutting Diagram:

- #5 v(E) bars at 1'-8" cts. Each face
- #5 v(E) bars at 12" cts.
- #5 h(E) bars
- #5 h(E) bars
- #5 v(E) bars
- #5 v(E) bars

Pile Data:

- Nominal Required Bearing
- Factored Resistance Available
- Est. Length
- No. Production Piles
- No. Test Piles

Bill of Material:

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
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<tbody>
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<td>#5 v(E)</td>
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<tr>
<td>#5 h(E)</td>
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Notes:

- For details of piles and concrete encasement, see sheet - of -.
- Cast backwall after beams and concrete wearing surface, if applicable, have been erected.
**ELEVATION**

- #6 u(E) bars
- #5 v(E) bars (See Field Cutting Diagram)
- #5 p(E) bars
- #5 h(E) bars

**PILE DATA**

- Nominal Required Bearing
- Factored Resistance Available
- No. Production Piles
- No. Test Piles

**FIELD CUTTING DIAGRAM**

- #5 v(E) bars
- #5 u(E) bars
- #5 p(E) bars
- #5 h(E) bars

**BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
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<tbody>
<tr>
<td>h(E)</td>
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<tr>
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<td>u(E)</td>
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<tr>
<td>v(E)</td>
<td>#5</td>
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**FIELD CUTTING DIAGRAM**

Order #5 v(E) full length. Cut as shown and use remainder of bars in opposite face.

**NOTES:**

- Cast top of wingwall flush with exterior, if applicable, have been erected.
- Cast backwall after beams and concrete wearing surface, if applicable, have been erected.
- For details of piles and Concrete Encasement, see sheet - of - .
BILL OF MATERIAL

<table>
<thead>
<tr>
<th>No.</th>
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PILE DATA

Type: Normal Required Bearing
Factored Resistance Available
Est. Length:
No. Production Pilings
No. Test Pilings

FIELD CUTTING DIAGRAM

Order h(E) and v(E) Full Length. Cut as shown and use remainder of bars in opposite face.

BAR h(E) & u(E)
AI-2440-R

Pour steps monolithically with cap.

Optional Construction Joints

Notes:

1 typ. & -typ. -typ. 1

2 v (E) Elev.

ELEVATION

Dimensions at right angles to abutment.

BILL OF MATERIAL

BAR h(E)

BAR u(E) & h(E)

BAR v(E) & h(E)

BAR s(E) & s(E)

BAR s(E)

BAR u(E)

PILE DATA

Type:

Nominal Required Shear:

Factored Resistance Available:

Nominal Required Bearing:

Type:

BAR h(E), h(E) or h(E) 2

BAR v(E)

BAR s(E)

BAR u(E)

FIELD CUTTING DIAGRAM

Order h(E) and v(E) full length, Cut as shown and use remainder of bars in opposite face.

For details of plan see sheet of ...
AI-2440S-R

Pour steps monolithically with cap.

Notes:

1. M6 typ. - typ. or M6 typ.

2. Elev.

Optional Construction Joints

Typ. btw. at cts. Piles

-#5 v(E) bars Each End

Each End

-v (E) or v (E) -

Elev.

Each End

Elev.

Each Face

Use remainder of bars in opposite face.

Order h(E) and v(E) full length. Cut as shown and use remainder of bars in opposite face.

For details of piles see sheet of .

Dimensions at right angles to abutment.

BILL OF MATERIAL

Bar

Size

Length

Shape

h(E)

p(E)

s (E)

u(E)

v (E)

v (E)

h (E)

p(E)

s (E)

u (E)

v (E)

h (E)

p(E)

s (E)

u(E)

v (E)

h (E)

p(E)

s (E)

u(E)

v (E)

h (E)

p(E)

s (E)

u(E)

v (E)

h (E)

p(E)

s (E)

u(E)

v (E)

h (E)

p(E)

s (E)

u(E)

v (E)

h (E)

p(E)

s (E)

u(E)

v (E)

h (E)

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s (E)

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v (E)

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v (E)

h (E)

p(E)
PILE DATA

Type: Normal Required Bearing
Factored Resistance Available
Est. Lengths
No. Production Piles
No. Test Piles

BILL OF MATERIAL

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For details of piles see sheet of.

ELEVATION

PLAN

FIELD CUTTING DIAGRAM

Order h(E) and v(E) full length. Cut as shown and use remainder of bars in opposite face.
STRUCTURE NO.

ABUTMENTS

PLAN

ELEVATION

BILL OF MATERIAL

PILE DATA

FIELD CUTTING DIAGRAM

For details of piles see sheet of .

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

ABUTMENTS

STREET NAME

FILE NAME

DEPARTMENT

STATE FA. RTE.

SECTION

COUNTY

CONTRACT NO.

TOTAL SHEETS

SHEET NO.

FILE DATE

DRAWN

CHECKED

DESIGNED

REVISED

DEPARTMENT OF TRANSPORTATION

STATE OF ILLINOIS

COUNTY

CONTRACT NO.

TOTAL SHEETS

SHEET NO.

FILE DATE

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STATE OF ILLINOIS

COUNTY

CONTRACT NO.

TOTAL SHEETS

SHEET NO.

FILE DATE

DRAWN

CHECKED

DESIGNED

REVISED
Sta.
Back of Abut.
~ Abut.
typ.
2'-0" cl.

Optional Construction Joints

ELEVATION

PLAN

SEC. THRU ABUT.

BILL OF MATERIAL

PILE DATA

FIELD CUTTING DIAGRAM

Order h(E) and v(E) full length. Cut as shown and use remainder of bars in opposite face.
Pour steps monolithically with cap.

Notes:

1 typ. -

Typ. btwn. at cts., -#5 v (E) bars.

Optional Construction Joints

Piles

Typ. -#5 v (E) bars at 12'' cts.

BAR u (E)

Each End

Fan -#5 u (E) bars,

Each Face

2-#5 v (E) bars,

1-#5 h (E) bar

Dimensions at right angles to abutment.

PILE DATA

Type:
Normal Required Strength
Factored Resistance Available
Est. Length
No. Production Piles
No. Test Piles

BILL OF MATERIAL

BAR h (E)
BAR p (E)
BAR s (E)
BAR ss (E)
BAR u (E)

FIELD CUTTING DIAGRAM

Order h (E) and s (E) full length. Cut as shown and use remainder of bars in opposite face.

STRUCTURE NO.
ABUTMENTS
BILL OF MATERIAL

PILE DATA

PLAN

FIELD CUTTING DIAGRAM

BAR v(E)

BAR h(E)

BAR s(E)

BAR a(E)

BAR v(E)

PILE DATA

ELEVATION

1'-0" (See Sec. Thru Abut.)

3 Lines of -#5 v(E) bars at 2" cts. (See Sec. Thru Abut.)

Ea. side of pile, typ.

1-#5 h(E) bar E.F.

4-#6 v(E) bars at 8" cts. E.F.

1-#5 s(E) bar E.F.

For details of piles see sheet of .
PILE DATA

Type: Normal Required Bearing

9 ft. resisted Available
Elev. Lengths
No. Production Piles
No. Test Piles

FIELD CUTTING DIAGRAM

BAR (E)

For details of bars see sheet of .

BILL OF MATERIAL

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Each End 1-#5 v (E) bars, typ. 2'-0" ch. Each Face 2-#5 v (E) bars, typ. 2'-6" ch. Each End 2-#5 u (E) bars, typ. 3''-10" ch. Each End 3 Lines of -#5 v (E) bars at 12'' cts., place parallel to Ed Rdwy. (See Sec. Thru Abut.)

For details of piles see sheet of .
APPENDIX B-PILE DATA

Type:
Method Required Tension
Factored Resistance Available:
No. Production Piles:
No. Test Piles:

ABUTMENT-PILE DATA

Type:
Method Required Bearing:
Factored Resistance Available:
Ext. Lengths:
No. Production Piles:
No. Test Piles:

Notes:
- Space reinforcement in cap to miss anchor bolts.
- Pour cap monolithically with cap.
- For details of piles, see sheet - of -.
- For details of reinforcement and Bill of Material, see sheet - of -.

Space reinforcement in cap to miss anchor bolts.
Pour cap monolithically with cap.
For details of piles, see sheet - of -.
For details of reinforcement and Bill of Material, see sheet - of -.
 APPROACH BENT-PILE DATA

Type:
Material Required Bearing:
Factored Resistance Available:
Est. Length:
No. Production Piles:
No. Test Piles:

ABUTMENT- PILE DATA

Type:
Material Required Bearing:
Factored Resistance Available:
Est. Length:
No. Production Piles:
No. Test Piles:

Notes:
Spacing reinforcement in cap to allow anchor bolts.
Pour shear monolithically with cap.
For details of piles, see sheet - of -.
For details of reinforcement and Bill of Materials,
see sheet - of -.
Bars at 12'' cts.

3 Prs.-#5 h (E) at 12'' cts. E.F.

3-#5 h (E) bars

3-#5 h (E) bars at 12'' cts. E.F.

Each Corner

1-#5 v (E) bar E.F.

Each Face

1-#5 h (E) bar

M in.
2'-0''

Cut to fit and use the remainder of bars.

Order h (E) and v (E) bars full length.

Studs at 18'' cts.

¢'' } x 6'' Welded
Alloy 6061-T6
Cap Screw & Washer
¢'' Stainless Steel

Provide Door on . Wall

Notes:

Pour steps monolithically with cap.

Approach Bent Step Detail
(Looking )

Door Elevation

Cost of door and frames are included with Concrete Structures.

Field Cutting Diagram

Order h (E) and v (E) bars full length.
Cut to fit and use the remainder of bars in opposite face.
**FIELD CUTTING DIAGRAM**

*Order h(E) & v(E) bars full length. Cut to fit as shown and use remainder of bars in other face.*

**BILL OF MATERIAL**

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**APP. BENT-PILE DATA**

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<tr>
<td>Nominal Required Bearing:</td>
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<tr>
<td>Type:</td>
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</table>

**ABUT. PILE DATA**

<table>
<thead>
<tr>
<th>Item</th>
<th>Nominal Required Bearing</th>
<th>Factored Resistance Available</th>
<th>EM. Length</th>
<th>No. Production Piles</th>
<th>No. Test Piles</th>
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<tbody>
<tr>
<td>No. Test Piles:</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. Production Piles:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Est. Length:</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Factored Resistance Available:</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Required Bearing:</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Type:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Cut to fit as shown and use remainder of bars in other face.

* Order h(E) & v(E) bars full length.
FIELD CUTTING DIAGRAM

* Order h(E) & v(E) bars full length.
Cut to fit as shown and use remainder of bars in other faces.

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>No.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
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</tbody>
</table>

APPR. BENT-PILE DATA

Type:
Nominal Required Bearing:
Factored Resistance Available:
EM. Length:
No. Production Piles:
No. Test Piles:

ABUT.- PILE DATA

Type:
Nominal Required Bearing:
Factored Resistance Available:
EM. Length:
No. Production Piles:
No. Test Piles:

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

F.A. RTE.
SECTION
COUNTY
CONTRACT NO.
TOTAL SHEETS
SHEET NO.
**Steel Pile Table**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Depth d</th>
<th>Width W</th>
<th>Flange thickness  t</th>
<th>Incremental diameter A</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 14x117</td>
<td>14''</td>
<td>117''</td>
<td>1''</td>
<td>30''</td>
</tr>
<tr>
<td>HP 10x57</td>
<td>10''</td>
<td>57''</td>
<td>1''</td>
<td>30''</td>
</tr>
<tr>
<td>HP 8x36</td>
<td>8''</td>
<td>36''</td>
<td>1''</td>
<td>30''</td>
</tr>
</tbody>
</table>

**H-Pile Shoe Attachment**

- See Detail A

**Welded Commercial Splice**

- Typical along four edges of flange E

**Welded Plate Field Splice**

- Weld size per pile shoe manufacturer (Š'' min.)

**Note:**
- The steel H-piles shall be according to AASHTO M270 Grade 50.
- Remove portions of backup plates that extend outside the flanges.
- Weld size per pile shoe manufacturer (Š'' min.).

**HP Pile Details**

<table>
<thead>
<tr>
<th>Designation</th>
<th>F</th>
<th>f1</th>
<th>f2</th>
<th>w</th>
<th>w1</th>
<th>w2</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP 14x117</td>
<td>12''</td>
<td>1''</td>
<td>6''</td>
<td>7''</td>
<td>2''</td>
<td>3''</td>
</tr>
<tr>
<td>HP 10x57</td>
<td>10''</td>
<td>6''</td>
<td>6''</td>
<td>7''</td>
<td>2''</td>
<td>3''</td>
</tr>
<tr>
<td>HP 8x36</td>
<td>8''</td>
<td>6''</td>
<td>6''</td>
<td>7''</td>
<td>2''</td>
<td>3''</td>
</tr>
</tbody>
</table>

**Note:**
- Intermittent welds 1/2'' from end of web and/or each flange.
- Remove portions of backup plates that extend outside the flanges.
**METAL SHELL PILE TABLE**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Outside Diameter</th>
<th>Wall Thickness</th>
<th>Weight per foot (lb/ft)</th>
<th>Volume (yd³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP12</td>
<td>0.179&quot;</td>
<td>0.0274</td>
<td>29.60</td>
<td>0.0054</td>
</tr>
<tr>
<td>PP14</td>
<td>0.200&quot;</td>
<td>0.0257</td>
<td>30.07</td>
<td>0.0056</td>
</tr>
<tr>
<td>PP16</td>
<td>0.250&quot;</td>
<td>0.0268</td>
<td>36.71</td>
<td>0.0062</td>
</tr>
<tr>
<td>PP18</td>
<td>0.312&quot;</td>
<td>0.0319</td>
<td>45.61</td>
<td>0.0064</td>
</tr>
</tbody>
</table>

**SECTION A-A**

**SECTION B-B**

**CONCRETE ENCASEMENT AT PIERS**

**METAL SHELL PILE SHOE ATTACHMENT**

(See Note A)

The pile shoes shall be cast in one piece steel according to either ASTM A 148 Grade 90-60 or AASHTO M 103 Grade 65-35 and shall provide full bearing over the full circumference of the metal shell pile. The pile shoes shall have tapered leads to assure proper alignment and fitting and shall be secured to the pile with a circumferential weld.

**COMPLETE PENETRATION WELD SPlice**

Field fabricated backing ring may be made from pile shell by removing segment to allow reducing circumference and vertically rejoined with partial joint penetration weld.

**CONCRETE ENCASEMENT AT PIERS**

Forms for encasement may be omitted when soil conditions permit.

**WELDED COMMERCIAL SPLICE**

The metal shell piles shall be according to ASTM A 252 Grade 3.

Note:

The metal shell piles shall be according to ASTM A 252 Grade 3.
DESIGN STRESSES

NOTES

To construct pile extension, chip top of pile back 36 bar 8 in. to expose vertical bars and lap vertical buildup or #8 bars. Remove spiral to 2 in. above chipping and provide full strength lap weld exterior face (4 in. length). For Pile lengths up to 65', use three slings placed at a distance of 0.12 L* from each end and at midpoint of pile. For Piles longer than 65', use three slings placed at a distance of 0.21 L* from each end. For handling piles longer than 45', use two slings placed at a distance of 0.15 L* from each end and at midpoint of pile.*L= Overall length of pile to be handled.

Prestressing steel shall be uncoated high strength, low-relaxation 7-wire strand. The nominal diameter shall be 3⁄8 in. with a cross-sectional area of 0.253 in². For Pile lengths up to 65', use two slings placed at a distance of 0.01 L* from each end. For Piles longer than 65', use three slings placed at a distance of 0.03 L* from each end and at midpoint of pile. Overall length of pile to be handled. For handling piles longer than 45', use two slings placed at a distance of 0.05 L* from each end.

PRECAST CONCRETE PILE
PRECAST PRESTRESSED CONCRETE PILE
STANDARD PILE EXTENSION
ALTERNATE PILE EXTENSION

NOTES

To construct pile extension, chip top of pile back 36 bar 8 in. to expose vertical bars and lap vertical buildup or #8 bars. Remove spiral to 2 in. above chipping and provide full strength lap weld exterior face (4 in. length). For Pile lengths up to 65', use three slings placed at a distance of 0.12 L* from each end and at midpoint of pile. For Piles longer than 65', use three slings placed at a distance of 0.21 L* from each end. For handling piles longer than 45', use two slings placed at a distance of 0.15 L* from each end and at midpoint of pile.*L= Overall length of pile to be handled.

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DESIGN STRESSES

f' = 5,000 p.s.i. (prestressed)
f' = 4,000 p.s.i. (precast)
f = 450,000 p.s.i. (Precast prestressed)
f = 270,000 p.s.i. (pc)
fa = 189,000 p.s.i. (28,900 lbs.-in.)

f' = 4,000 p.s.i. (precast)
f' = 5,000 p.s.i. (prestressed)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PRECAST PILE DETAILS
STRUCTURE NO.
Notes:
Space reinforcement in cap to miss anchor bolts.
Pour slab monolithically with cap.

For details of piles, see sheet of .

PILE DATA

Type:
Nominal Required Bearing:
Factored Resistance Available:
Cut Length:
No. Production Piles:
No. Test Piles:

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
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<tbody>
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TEXT

Pour slab monolithically with cap.

For details of piles, see sheet of .

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<thead>
<tr>
<th>Type</th>
<th>Nominal Required Bearing</th>
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<th>Cut Length</th>
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<th>No. Test Piles</th>
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BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Bar No.</th>
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<th>Length</th>
<th>Shape</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>
Notes:
- Space reinforcement in cap to avoid anchor bolts.
- Pour ships monolithically with cap.
For details of piles, see sheet - of - .
Space reinforcement in cap to miss anchor bolts.
Pour shear monolithically with cap.
For details of piles, see sheet - of -.

PILE DATA

Typical
Nominal Required Bearing:
Factored Resistance Available:
End Length:
No. Production Piles:
No. Test Piles:

TOTAL SHEETS
SHEET NO.
CONTRACT NO.
PROJECT NO.
COUNTY
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BILL OF MATERIAL

Bar No. | Size | Length | Shape | Note
--- | --- | --- | --- | ---
A | | | | 
B | | | | 
C | | | | 
D | | | | 

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
PIER
STRUCTURE NO.

NOTE: The text seems to be a part of a structural engineering design, including plans, sections, and details of materials and dimensions. The diagram includes various views such as top plan, elevation, and footing plan, with annotations for reinforcement bar sizes and placements. The bill of material lists various items with corresponding notes and specifications.
Section C-C
Each Face

Section B-B
Each Face

Section D-D
Each Face

Bill of Material

<table>
<thead>
<tr>
<th>No.</th>
<th>Test Piles:</th>
<th>Production Piles:</th>
<th>Est. Length:</th>
<th>Factored Resistance Available:</th>
<th>Nominal Required Bearing:</th>
</tr>
</thead>
</table>

Notes:

- Pour steps monolithically with cap.
- Space reinforcement in cap to miss anchor bolts.

For details of piles, see sheet - of -.
Notes:
- Splice reinforcement in cap to miss anchor bolts.
- Pour steps monolithically with cap.
- For details of piles, see sheet - of -.

**PILE DATA**

- Type:
- Nominal Required Bearing:
- Factored Resistance Available:
- Ess. Length:
- No. Production Piles:
- No. Test Piles:

**BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>Material</th>
<th>No. Test Piles:</th>
<th>No. Production Piles:</th>
<th>Est. Length:</th>
<th>Factored Resistance Available:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concrete</td>
<td>20</td>
<td>100</td>
<td>100 ft</td>
<td>20,000 lbs</td>
</tr>
</tbody>
</table>

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**PIER**

**FILE NAME**

**PLOT SCALE**

**PLOT DATE**

**CHECKED**

**DRAWN**

**CHECKED**

**DESIGNED**

**REVISED**

**REVISED**

**REVISED**

**REVISED**

**DEPARTMENT OF TRANSPORTATION**

**STATE OF ILLINOIS**

**CONTRACT NO.**

**TOTAL SHEETS**

**SHEET NO.**

**F.A. RTE. SECTION**

**COUNTY**

**CONSTRUCTION**

**Pour steps monolithically with cap.**

**Space reinforcement in cap to miss anchor bolts.**

**For details of piles, see sheet - of -.
Notice:
- Space reinforcement in cap to miss anchor bolts.
- Your details must be completed with cap.
- For details of piles, see sheet of "..."

PILE DATA
- Type:
- Nominal Required Bearing:
- Factored Resistance Available:
- Est. Length:
- No. Production Piles:
- No. Test Piles:

A & B DIMENSIONS

BAR A
- Size
- Length
- Shape

BAR B
- Size
- Length
- Shape

BILL OF MATERIAL
- Type:
- Size
- Length
- Shape

FOOTING PLAN
- Size
- Length
- Shape

PILE DATA
- No. Test Piles:
- No. Production Piles:
- Est. Length:
- Factored Resistance Available:
- Nominal Required Bearing:
- Type:
- Driving Piles:
- Filling - Piles:
- Footing - Piles:
- Foundation - Piles:
- Footing - Required Bearing:
- Footing - Structure:

END VIEW

TOP PLAN

FLOORVIEW

A & B DIMENSIONS

BAR A
- Size
- Length
- Shape

BAR B
- Size
- Length
- Shape

FOOTING PLAN
- Size
- Length
- Shape

PILE DATA
- No. Test Piles:
- No. Production Piles:
- Est. Length:
- Factored Resistance Available:
- Nominal Required Bearing:
- Type:
- Driving Piles:
- Filling - Piles:
- Footing - Piles:
- Foundation - Piles:
- Foundation - Required Bearing:
- Foundation - Structure:
Notes:
Space reinforcement in cap to plus another bars.
Pour area monolithically with cap.
For details of piles, see sheet - or -.

PILE DATA

Type:  
Material: Required Bearing: 
Footing Reinforcement Availability: 
Ed. Length: 
No. Production Piles: 
No. Test Piles: 

Bar No. | Size | Length | Shape
--- | --- | --- | ---
A | B | 

---

BARS

A & B DIMENSIONS

---

ELEVATION

---

FOOTING PLAN

---

BILL OF MATERIAL

---

END VIEW

---

TOP PLAN

---

SEC. A-A

---

SEC. B-B

---

NOTE: Length is height of spiral.
PILE DATA

Types:
- 440 ksi Reinforced Bars
- 36 ksi Rebar
- 40 ksi Steel Plate

Footings:
- For footings over 2' wide:
  - Spacers or equivalent.
  - Pier cap. Provide 4-#4 spacers or equivalent.
  - Extend spiral 2" into top and bottom.

Bar & B Dimensions
- A & B Dimensions
- Optional elements:
  - Spacers or equivalent.
  - Pier cap.

NOTES:
- For details of piles, see sheet # of.
- Pour steps monolithically with cap.
- Space reinforcement in cap to miss anchor bolts.
- Pour floor monolithically with cap.
- Three reinforcement bars:
  - Two bars Epoxy Coated
  - One bar Epoxy Coated

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Bar</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>n(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>u(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>s(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>p(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FOOTING PLAN

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PIER STRUCTURE NO.

P-26
* Limits of Drilled Shaft in Soil

- Each End
  - Top & Bottom:
    - # s(E) bars

- Top of Rock
  - Ground surface

- Drilled Shaft
  - Top of Elev.
  - Estimated ground surface
  - Estimated top of rock

** If the prevailing water surface elevation during construction is consistently different from estimated on the plans, the contractor may propose an adjustment to the top of the drilled shaft elevation as part of their installation procedures. The top of all drilled shafts within a substructure unit shall be adjusted to the same elevation and extend above the prevailing water surface. The quantities and reinforcement detailing are based on the top of shaft and the estimated elevations shown and may change based on the actual elevations encountered at each shaft and the final top of shaft elevation.

** Length is height of spiral.

---

** BILL OF MATERIAL **

<table>
<thead>
<tr>
<th>BAR</th>
<th>No.</th>
<th>Size</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>s(E)</td>
<td>#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p(E)</td>
<td>#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>u(E)</td>
<td>#</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v(E)</td>
<td>#</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Cast steps monolithically with cap.
- Space cap reinforcement to miss anchor bolts.
- Minimum lap for spirals.
- Epoxy Coated Reinforcement Bars.
The quantities and reinforcement detailing are based on the top of shaft and the estimated top of rock elevations shown and may change based on the actual top of rock encountered at each shaft and the final top of shaft elevation.
Contractor is responsible for determining the casing thickness and the actual top elevation to be used. See Article 5A.05.26 of the Standard Specifications.

Flap bolts for the permanent casing are based on the minimum length shown.

** Limits of Drilled Shaft in Rock

* Limits of Drilled Shaft in Soil

Length is height of spiral.

** Minimum lap for spirals = Space cap reinforcement to miss anchor bolts.

Cast steps monolithically with cap. Space cap reinforcement to miss anchor bolts, extend cap for spirals

** length is height of spiral.

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**BILL OF MATERIAL**

**BAR s(E) & s(E)**

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**ELEVATION**

- **Construction Sequence for Web Walls:**
  1. Excavate between shafts to elevation of web wall base and set lower web wall forms through water to bear on the circular edge of drilled shafts. Secure in place with tie bars or ties forms together as required.
  2. Place the lower web reinforcement cage into the forms using spacers to maintain proper clearances.
  3. Before the forms can be sealed against the shafts and strengthened to slow waterproofing, the reinforcement and the concrete placement may be completed in the dry. Alternatively, the related cage can be covered into position through water and the concrete discharged at the base of the excavation through a tremie pipe or pump hose, displacing minimum lap for spirals. 
  5. Construct upper web walls.

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**SECTION C-C**

- **If the prevailing water surface elevation during construction is consistently different than estimated on the plans, the contractor may propose an adjustment to the top of the drilled shaft elevation as part of their installation procedure. The top of all drilled shafts within a substructure unit shall be constructed to the same elevation and extend above the prevailing water surface.**