<table>
<thead>
<tr>
<th>CELL / MODEL NAME</th>
<th>DESCRIPTION</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>P-1</td>
<td>Solid straight stem pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-10</td>
<td>Single hammerhead pier (modified)</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-11</td>
<td>Two column trapezoidal pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-12</td>
<td>Three column trapezoidal pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-13</td>
<td>Four column trapezoidal pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-14</td>
<td>Five column trapezoidal pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-2</td>
<td>Single hammerhead pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-24</td>
<td>Four column pier (over railroad)</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-26</td>
<td>Six column pier (over railroad)</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-3</td>
<td>Double hammerhead pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-4</td>
<td>Double hammerhead pier (alternate)</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-5</td>
<td>Three column pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-6</td>
<td>Multiple column pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-7</td>
<td>Trapezoidal pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-DS</td>
<td>Drilled shaft pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-DSCW</td>
<td>Drilled shaft pier with crashwall</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-DSSW</td>
<td>Drilled shaft pier (solid)</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-DSTB</td>
<td>Drilled shaft pier with transfer beam</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>P-DSWW</td>
<td>Drilled shaft pier with webwall</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>PB-1</td>
<td>Solid battered stem pier</td>
<td>2/17/2017</td>
</tr>
<tr>
<td>PC-1</td>
<td>Solid straight stem pier with cap</td>
<td>2/17/2017</td>
</tr>
</tbody>
</table>
Notes:
- Space reinforcement in cap to miss anchor bolts.
- Pour steps monolithically with cap.
- For details of piles, see sheet - of -

Each End
- # v(E) bars at cts. Each Face
- # h(E) bars at cts. Each Face
- # n(E) bars at cts. Each Face

Each Face
- # v(E) bars at cts.
- # h(E) bars at cts.
- # n(E) bars at cts.

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

FOOTING PLAN

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Bar No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Structure Excavation Co. Inc.
Concrete Rebars Co. Inc.
Reinforcement Bars, Epoxy Coated
Furnishing Piles, Foot
Pouring Piles, Foot
Test Pile, Each

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

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

End View

Top Plan

Elevation

Footing Plan

End View

P-1
2-17-2017
Notes:
Space reinforcement in cap to miss anchor bolts.
Pour steps monolithically with cap.
For details of piles, see sheet - - of -.

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

TOP PLAN
- # s (E) at cts.
- # s (E) bars at cts.
Each End
- # p (E) bars
Each End
- 3-48 h (E) bars Each Face
- # 3 (E) bars Bottom
Optional const. joint

ELEVATION
(looking T)

FOOTING PLAN

A & B DIMENSIONS

BARS

BILL OF MATERIAL
Bar No.  Size  Length  Shape  Notes
s (E)  #  

SECTION A-A

SECTION B-B

SECTION C-C

BARS n (E) & n (E)

END VIEW

FORGE & PIER

A & B DIMENSIONS

BARS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
PIER
STRUCTURE NO.
No Test Piles:
Notes:
Space 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:
Est. Length:
No. Production Piles:
No. Test Piles:

TOP PLAN
- # s (E) bars at cts.
- # p (E) bars Top
- # h (E) bars Each Face
- # s (E) bars at cts.
- # s (E) bars at cts.
- # s (E) bars at cts.
- # h (E) bars Each Face

SEC. A-A
# n (E) bars

SEC. B-B
- # p (E) bars Top
- # s (E) bars Bottom

BILL OF MATERIAL
BAR n (E)
BAR s (E)
BAR u (E)

END VIEW

A & B DIMENSIONS

BARS

ELEVATION

FOOTING PLAN

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

PIER STRUCTURE NO.

P-24
2-17-2017
Notes:
- Splice reinforcement in cap to miss anchor bolts.
- Pour steps monolithically with cap.
- For details of piles, see sheet - of -.

PILE DATA
- Type: Pile
- Nominal Required Bearing: 100 kips
- Factored Resistance Available: 70 kips
- Est. Length: 30 ft
- No. Production Piles: 10
- No. Test Piles: 3

TOP PLAN
- # s(E) bars at top and bottom
- # p(E) bars at top and bottom
- # u(E) bars at top and bottom
- # n(E) bars at top and bottom
- # r(E) bars at top and bottom

ELEVATION (Looking )
- # s(E) bars at top and bottom
- # n(E) bars at top and bottom
- # r(E) bars at top and bottom

FOOTING PLAN
- # s(E) bars at top and bottom
- # u(E) bars at top and bottom

BILL OF MATERIAL
- # Bar n(E)
- # Bar s(E)
- # Bar u(E)

A & B DIMENSIONS
- Bar A
- Bar B

BARS
- Bar A
- Bar B

Footings - Piles, Foot
Driving Piles, Foot
Epoxy Coated Reinforcement Bars, Pound
Structural Specifications, CU-FE
Structural Excavation Co-Fe
Epoxy Coated Bars, Emulsified
---
---
---
---
Notes:
Space 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:
L: Length:
No. Production Piles:
No Test Piles:

TOP PLAN
# s (E) bar at its
# p (E) bars Top

SECTION A-A
# p (E) bars Top
Bottom of Cap Ea. End

END VIEW
(Are)

ELEVATION
(Loe)

FOOTING PLAN

BILL OF MATERIAL

P-4
2-17-2017

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
PIER STRUCTURE NO.
Notes:
Space reinforcement in cap to miss anchor bolts. Pour steps monolithically with cap. For details of piles, see sheet - of -.

PILE DATA

Type: Epoxy Coated Reinforcement Bars, Driving Piles

Driving Piles

Test Pile

Concrete Structures

Structure Fabrication: C1, C2

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

For details of piles, see sheet - of -.
**Note:**
- Space 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:
- Ex. Length:
- No. 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>
</tr>
</thead>
<tbody>
<tr>
<td>h(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n(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>
<tr>
<td>s(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>s(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>s(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>t(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>v(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>w(E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**PIER STRUCTURE NO.**
* Limits of Drilled Shaft in Soil

Drilled Shaft in Rock

Each End

Top & Bottom

-# s(E) bars at each end
-# p(E) bars -# s(E) bars at each end
-# p(E) bars -# u(E) bars
-# p(E) bars Bottom

-# p1(E) bars
-# p2(E) bars

Each End

Bottom

Top & Bottom

-# u(E) bars

Each End

Top & Bottom

-# s(E) bars at each end
-# p(E) bars

H(E)

Top of rock

Estimated ground surface

Estimated top of rock

Estimated water surface

All shafts to be constructed to the same elevation and extend above the prevailing water surface. The quantities and reinforcement detailing are based on the top of each 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.

* 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. The quantities and reinforcement detailing are based on the top of each 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.

** Minimum lap for spirals = Length is height of spiral

** Splice cap reinforcement to miss anchor bolts.

Concrete Structures

Reinforcement Bars

Epoxy Coated Reinforcement Bars,

Spacers or equivalent.

Provide min. 4-#4 turn top and bottom.

Provide 1-# sp 1 spiral

Each Column

# sp1(E) spiral

Each Shaft

# s(E) bars at each end

Top & Bottom

See Sec. B-B

Pitch

Top of rock

5" cl.

Concrete columns to be cast monolithically with cap.

Top of rock

Estimated ground surface

Estimated water surface

Opt. cover joint

Drilled Shaft in Soil

Drilled Shaft in Rock

Minimum lap for spirals = Length is height of spiral

** Minimum lap for spirals = Length is height of spiral

Concrete Structures

Reinforcement Bars

Epoxy Coated Reinforcement Bars,

Spacers or equivalent.

Provide min. 4-#4 turn top and bottom.

Provide 1-# sp 1 spiral

Each Column

# sp1(E) spiral

Each Shaft

# s(E) bars at each end

Top & Bottom

See Sec. B-B

Pitch

Top of rock

5" cl.

Concrete columns to be cast monolithically with cap.

Top of rock

Estimated ground surface

Estimated water surface

Opt. cover joint

Drilled Shaft in Soil

Drilled Shaft in Rock

Minimum lap for spirals = Length is height of spiral

** Minimum lap for spirals = Length is height of spiral

Concrete Structures

Reinforcement Bars

Epoxy Coated Reinforcement Bars,

Spacers or equivalent.

Provide min. 4-#4 turn top and bottom.

Provide 1-# sp 1 spiral

Each Column

# sp1(E) spiral

Each Shaft

# s(E) bars at each end

Top & Bottom

See Sec. B-B

Pitch

Top of rock

5" cl.

Concrete columns to be cast monolithically with cap.

Top of rock

Estimated ground surface

Estimated water surface

Opt. cover joint

Drilled Shaft in Soil

Drilled Shaft in Rock

Minimum lap for spirals = Length is height of spiral

** Minimum lap for spirals = Length is height of spiral

Concrete Structures

Reinforcement Bars

Epoxy Coated Reinforcement Bars,

Spacers or equivalent.

Provide min. 4-#4 turn top and bottom.

Provide 1-# sp 1 spiral

Each Column

# sp1(E) spiral

Each Shaft

# s(E) bars at each end

Top & Bottom

See Sec. B-B

Pitch

Top of rock

5" cl.

Concrete columns to be cast monolithically with cap.

Top of rock

Estimated ground surface

Estimated water surface

Opt. cover joint

Drilled Shaft in Soil

Drilled Shaft in Rock

Minimum lap for spirals = Length is height of spiral

** Minimum lap for spirals = Length is height of spiral

Concrete Structures

Reinforcement Bars

Epoxy Coated Reinforcement Bars,
Contractor is responsible for determining the casing thickness and the actual top elevation to be used. See Article 518.006(a) of the Standard Specifications.

Pay limits for the Permanent Casing are based on the minimum length shown.

**Drilled Shaft in Soil**

- Limits of Drilled Shaft in Soil based on the minimum length shown.

**Drilled Shaft in Rock**

- Limits of Drilled Shaft in Rock based on the minimum length shown.

Estimated ground surface elevation to be used. See Article 516.06(d) for the casing thickness and the actual tip elevation and extend above the prevailing water surface. The 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 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.

Construction Sequence for encasement walls:
1. Excavate through water, between and outside of shafts, to base of lower encasement wall.
2. Set lower encasement wall forms into place through water and secure at top and bottom as required to maintain proper clearances from shaft and forms.
3. Place the lower encasement wall reinforcement cage into forms using spacers to maintain proper clearances from shaft and forms.
4. If the forms can be sealed against the streambed to allow dewatering, the reinforcement and the concrete placement may be completed in the dry. Alternatively, the rebar cage can be lowered into position through water and the concrete discharged at the base of the excavation through a tremie pipe. The tremie hose, displacing water, sediment, and tainted concrete out the top of the forms.
5. Prepare construction joint at top of drilled shafts and lower encasement wall.
6. Spike upper encasement wall reinforcement and cage length to lower encasement and shaft reinforcement, form and pour upper encasement wall.

**STATE OF ILLINOIS**

**DEPARTMENT OF TRANSPORTATION**

**PIER STRUCTURE NO.**

**BILL OF MATERIAL**

<table>
<thead>
<tr>
<th>Bar</th>
<th>No.</th>
<th>Size</th>
<th>Length</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>4</td>
<td>#4</td>
<td>4'</td>
<td>Bars</td>
</tr>
<tr>
<td>#2</td>
<td>4</td>
<td>#6</td>
<td>4'</td>
<td>Bars</td>
</tr>
<tr>
<td>#3</td>
<td>4</td>
<td>#8</td>
<td>4'</td>
<td>Bars</td>
</tr>
<tr>
<td>#4</td>
<td>4</td>
<td>#10</td>
<td>4'</td>
<td>Bars</td>
</tr>
</tbody>
</table>

Concrete Structures Co. Inc.

Reinforcement Bars,  .

Dewatering Bar & Pump Hose...

Drilled Shaft in Rock Each

Permanent Casing 1'-0"...
### Drilled Shaft in Soil

- The limits of drilled shaft in soil vary with the shaft form.
- For each shaft, the estimated elevations shown and may change based on the actual elevations encountered at each shaft and the final top of shaft elevation as part of their construction procedure.

### Drilled Shaft in Rock

- The quantities and reinforcement details 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.

#### Construction Sequence for Web Wall

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.
2. Secure in place with fill, struts or tie forms together as required.
3. If the forms can be sealed against the shafts and streambed to maintain proper clearances.
4. Place the lower web wall reinforcement cage into the forms using spacers or equivalent.
5. Secure in place with fill, struts or tie forms together as required.

#### Reinforcement Bars

- **Concrete Structures Co. Ltd.**
  - **Reinforcement Bars**
  - **Pound**

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

**Bill of Material**

- **Bar s(E) & s2(E)**

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

**Concrete Structures Co. Ltd.**

- **Reinforcement Bars**
  - **Pound**
  - **Each**
  - **Underwater Structural Protection Precaution**
  - **Each**

**Concrete Structures Co. Ltd.**

- **Reinforcement Bars**
  - **Space cap reinforcement to miss anchor bolts.**
  - **Length is height of spiral.**

#### Construction Notes

- 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. The quantities and reinforcement details 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.

#### P-DSWW

- **Structural No.**
  - **STATE OF ILLINOIS**
  - **DEPARTMENT OF TRANSPORTATION**

- **BILL OF MATERIAL**
  - **Concrete Structures Co. Ltd.**
  - **Reinforcement Bars**
  - **Pound**
  - **Each**
  - **Underwater Structural Protection Precaution**
  - **Each**

**Excavation Protection**

- **Each**

**State of Illinois**

- **Drilled Shaft in Soil**
  - **Cu. Yd.**
  - **Pound**

**Count**

- **Pier**
  - **No.**

**DATE**

- **2-17-2017**

**DEPARTMENT OF TRANSPORTATION**

- **STATE OF ILLINOIS**
  - **Drilled Shaft in Soil**
  - **Cu. Yd.**
  - **Pound**

**BILL OF MATERIAL**

- **Concrete Structures Co. Ltd.**
  - **Reinforcement Bars**
  - **Pound**
  - **Each**
  - **Underwater Structural Protection Precaution**
  - **Each**

**Excavation Protection**

- **Each**

**State of Illinois**

- **Drilled Shaft in Soil**
  - **Cu. Yd.**
  - **Pound**

**Count**

- **Pier**
  - **No.**

**DATE**

- **2-17-2017**
Notes:
Square reinforcement in cap to miss anchor bolts.
Pour steps monolithically with cap.
For details of piles, see sheet \( \ldots \).

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

DETAIL OF BARS
v (E) or n (E) bars at cts. Each Face

BILL OF MATERIAL
<table>
<thead>
<tr>
<th>Bar</th>
<th>No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FOOTING PLAN

PB-1
2-17-2017

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
PIER STRUCTURE NO.
### PILE DATA

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

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

### BILL OF MATERIAL

<table>
<thead>
<tr>
<th>Bar</th>
<th>No.</th>
<th>Size</th>
<th>Length</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>s (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>v (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>n (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>
<tr>
<td>w (E)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### FOOTING PLAN

**PC-1**

**2-17-2017**

**STATE OF ILLINOIS**
**DEPARTMENT OF TRANSPORTATION**

**PIER**
**STRUCTURE NO.**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Ft</th>
<th>Yd</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 (E)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p (E)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>s (E)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>u1 (E)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>t (E)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>v (E)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**END VIEW**

**TOP PLAN**

**ELEVATION**

**FOOTING PLAN**