<table>
<thead>
<tr>
<th>CELL / MODEL NAME</th>
<th>DESCRIPTION</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSA-SB-PSSP-LS</td>
<td>2 rows of reinf in top slab; 1 row of reinf in each sidewall; Permanent Steel Sheet Pile Wingwalls, Left Skew</td>
<td>10/15/2016</td>
</tr>
<tr>
<td>TSA-SB-PSSP-RS</td>
<td>2 rows of reinf in top slab; 1 row of reinf in each sidewall; Permanent Steel Sheet Pile Wingwalls, Right Skew</td>
<td>10/15/2016</td>
</tr>
<tr>
<td>TSA-SB-PSSP-ZS</td>
<td>2 rows of reinf in top slab; 1 row of reinf in each sidewall; Permanent Steel Sheet Pile Wingwalls, Zero Skew</td>
<td>10/15/2016</td>
</tr>
<tr>
<td>TSA-SC-PSSP-LS</td>
<td>2 rows of reinf in top slab; 2 rows of reinf in each sidewall; Permanent Steel Sheet Pile Wingwalls, Left Skew</td>
<td>10/15/2016</td>
</tr>
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<td>TSA-SC-PSSP-ZS</td>
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<td>10/15/2016</td>
</tr>
<tr>
<td>TSB-SB-PSSP-LS</td>
<td>1 row of reinf in top slab; 1 row of reinf in each sidewall; Permanent Steel Sheet Pile Wingwalls, Left Skew</td>
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<td>TSB-SB-PSSP-RS</td>
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<td>TSB-SC-PSSP-ZS</td>
<td>1 row of reinf in top slab; 2 rows of reinf in each sidewall; Permanent Steel Sheet Pile Wingwalls, Zero Skew</td>
<td>10/15/2016</td>
</tr>
</tbody>
</table>
LONGITUDINAL SECTION

(b) bars in skew portion of side shell shall be ordered full length & cut to fit. Balance of bar to be used in opposite end of culvert.

(h) bars in skew portion of side shell shall be ordered full length & cut to fit.

At the Contractor's option, a longer (h) bar may be ordered to replace the (h) bar. No reduction in quantities shall be made for this substitution.

**Notes:**
- Bars indicated thus 3 x 4-#5 etc. indicates 3 lines of bars with 4 lengths per line.
- Geosynthetic filter fabric per Section 1028 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.
- All reinforcement bars shall be furnished and installed having a minimum yield strength of 650 psi or a minimum compressive strength of 3500 psi.
- The cost of reinforcing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.

**Detailed Notes:**
- **Filter Fabric**
  - per Section 1080.01 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.
- **Elastomeric Mat**
  - per Section 1028 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.
- **Geosynthetic Filter Fabric**
  - per Section 1028 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.
- **Reinforcement Bars**
  - per AASHTO M270 Grade 50W.

**Bill of Material**

<table>
<thead>
<tr>
<th>BAR</th>
<th>#</th>
<th>DIA</th>
<th>LENGTH</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR a</td>
<td>1</td>
<td>2</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BAR b</td>
<td>2</td>
<td>6</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BAR c</td>
<td>3</td>
<td>4</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BAR d</td>
<td>4</td>
<td>2</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>

**LONGITUDINAL SECTION**

(Continuations of W. L. to E. Roadway)

SECTION THRU HEADWALL

SECTION THRU BARREL

BILL OF MATERIAL

<table>
<thead>
<tr>
<th>BAR</th>
<th>#</th>
<th>DIA</th>
<th>LENGTH</th>
<th>QTY</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAR a</td>
<td>1</td>
<td>2</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BAR b</td>
<td>2</td>
<td>6</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BAR c</td>
<td>3</td>
<td>4</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
<tr>
<td>BAR d</td>
<td>4</td>
<td>2</td>
<td>8'0&quot;</td>
<td>1</td>
</tr>
</tbody>
</table>
Sheet piling shall not be driven until the concrete strength has attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.

The minimum effective section modulus of the permanent steel sheet pile wall shall be $\frac{I}{w} = \text{in.}^3/\text{ft.}$

The cost of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.

Each Corner Bar
- $h$ bars at $12"$ cts.
- $d$ bars at $8"$ cts.
- $a$ bars at $12"$ cts.
- $b$ bars at $8"$ cts.

Bott. of Bottom Slab
- $h$ bars at $12"$ cts.
- $d$ bars at $8"$ cts.
- $a$ bars at $12"$ cts.
- $b$ bars at $8"$ cts.

Top of Bottom Slab
- $h$ bars at $12"$ cts.
- $d$ bars at $8"$ cts.
- $a$ bars at $12"$ cts.
- $b$ bars at $8"$ cts.

Top of Top Slab
- $h$ bars at $12"$ cts.
- $d$ bars at $8"$ cts.
- $a$ bars at $12"$ cts.
- $b$ bars at $8"$ cts.

Each Wall
- $h$ bars at $12"$ cts. I.F.
- $d$ bars at $8"$ cts. I.F.
- $a$ bars at $12"$ cts. O.F.
- $b$ bars at $8"$ cts. O.F.

**Notes:**
- Bars indicated thus $12 x 4 -#5$ etc. indicates $12$ lines of bars with $4$ lengths per line.
- No reduction in quantities shall be made for this substitution.
- The minimum effective section modulus of the permanent steel sheet pile wall shall be in. $^3/ft.$
- Steel piling shall not be driven until the concrete strength has attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.
- The cost of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.

**Dimensions at Rt. {'s to ~ Roadway**

- $\text{Elev.}$
- $\text{Sta.}$
- $\text{Face}$
- $\text{Back}$
- $\text{Downstream}$
- $\text{Upstream}$

**Concrete Slab Materials**
- Slab
- Reinforcement Bars
- Geosynthetic Filter Fabric

**Geosynthetic Filter Fabric** per Section 1028.01 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.

**Specifications**
- Minimum weight shall be 4 oz./sq. yd. Fold as shown.
- The cost of furnishing and installing the manufactured steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.
These are the notes:

- Bars indicated thus # x # in. - indicates # lines of bars with # lengths per line.
- The minimum effective section modulus of the permanent steel sheet pile wall shall be in. / ft.
- 等于
- The cost of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.

Notes:

- Erection of the culvert shall not be held up, in the absence of abnormal weather conditions, as a reason for delay in the construction of the culvert.
- Permanent Sheet Piling shall not be driven until the concrete strength has attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.
- ... and filter fabric shall be included in the cost of Permanent Sheet Piling.

**Bill of Material**

<table>
<thead>
<tr>
<th>Sheet No.</th>
<th>Size</th>
<th>Length</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2x4</td>
<td>3x4</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3x4</td>
<td>4x4</td>
<td>3</td>
</tr>
</tbody>
</table>

**Corner Detail**

- 每个角落
- 钢筋 4 号

**Section A-A**

- 水平截面
- 垂直截面
- 角落

**Longitudinal Section**

- 水平剖面
- 垂直剖面
- 角落

**Section Thru Barrels**

- 水平剖面
- 垂直剖面
- 角落

**Plan Showing Headwall**

- 断面图
- 施工图
- 角落

**Bill of Material**

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>#7</td>
<td>Bars</td>
<td>100</td>
</tr>
<tr>
<td>#8</td>
<td>Bars</td>
<td>50</td>
</tr>
<tr>
<td>#9</td>
<td>Bars</td>
<td>30</td>
</tr>
<tr>
<td>#10</td>
<td>Bars</td>
<td>10</td>
</tr>
</tbody>
</table>

**Corner Detail**

- 角落
- 钢筋 4 号

**Section A-A**

- 水平截面
- 垂直截面
- 角落

**Longitudinal Section**

- 水平剖面
- 垂直剖面
- 角落

**Section Thru Barrels**

- 水平剖面
- 垂直剖面
- 角落

**Plan Showing Headwall**

- 断面图
- 施工图
- 角落

**Bill of Material**

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<tr>
<td>#9</td>
<td>Bars</td>
<td>30</td>
</tr>
<tr>
<td>#10</td>
<td>Bars</td>
<td>10</td>
</tr>
</tbody>
</table>
The drawings include plans and cross-sections of a culvert. The following annotations and details are included:

- **Longitudinal Section**:
  - Dimensions of H.W. L to E Roadway

- **Section Thru Headwall**:
  - Showing Headwall
  - Showing Tie Wall
  - Longitudinal Section
  - Section Thru Barrel

- **Bill of Material**:
  - Details of materials and quantities are listed in a table format.

- **Notes**:
  - Bars indicated thus 3 x 4" = 3 bars with 4" length per line.
  - For substitution, a larger size bar may be ordered to replace the x bar. No reduction in quantity shall be made for this substitution.
  - The minimum effective section modulus of the permanent sheet pile wall shall be 2 in. /ft.
  - Steel piling shall not be driven until the concrete strength has attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.

- **Geosynthetic Filter Fabric**:
  - Per Section 1080.01 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.

- **Concrete Box Culverts**:
  - Per AASHTO M270 Grade 50W

- **Section A-A**:
  - Details of the structure are shown in section A-A.

The document is related to the construction and design of a culvert in the state of Illinois, involving the use of permanent sheet piling, geosynthetic filter fabric, and concrete box culverts.
Notes:

- Bars indicated thus 3-#4 x 8'-0" etc. indicates 3# lines of bars with 8' length per line.
- At the Contractor's option, a larger v bar may be ordered to replace the v bar. No reduction in quantities shall be made for this substitution.
- The minimum effective section modulus of the permanent steel sheet pile wall shall be 111 in. /ft.
- Steel piling shall not be driven until the concrete strength has attained a minimum flexural strength of 650 psi or a minimum compressive strength of 3500 psi.
- The cost of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.

**Concrete Block Culvert**

- Reinforcement Bars
  - For 2" min. cl.
  - Tilt hook of a cl.
  - Const. Jt.

**Permanent Sheet Piling**

- Foundation sheet per Section 1028 of the Standard Specifications.
- Geosynthetic filter fabric per Section 1080.01 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.

**Concrete pile (typ.)**

- For 2" min. cl.
- Tilt hook of a cl.
- Const. Jt.

**Steel pile (typ.)**

- 6" piling (typ.)
- Permanent Sheet Piling

**Concrete Block Culvert**

- Reinforcement Bars
  - For 2" min. cl.
  - Tilt hook of a cl.
  - Const. Jt.

**Permanent Sheet Piling**

- Foundation sheet per Section 1028 of the Standard Specifications.
- Geosynthetic filter fabric per Section 1080.01 of the Standard Specifications. Minimum weight shall be 4 oz./sq. yd. Fold as shown.

**Concrete pile (typ.)**

- For 2" min. cl.
- Tilt hook of a cl.
- Const. Jt.

**Steel pile (typ.)**

- 6" piling (typ.)
- Permanent Sheet Piling
LONGITUDINAL SECTION

(Corner of Rt. L to E Roadway)

PLAN

SECTION THRU HEADWALL

SECTION A-A

BILL OF MATERIAL

Notes:

Bars indicated thus # x # length per line.

The cost of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Sheet Piling.

CONTRACT NO.

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

CULVERT DETAILS

STRUCTURE NO.

T Diagram

SECTION A-A

FILE NAME

TSB-SC-PSSP-LS

REVISED 12-3-2016

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

CULVERT DETAILS

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T Diagram

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CULVERT DETAILS

STRUCTURE NO.

T Diagram

SECTION A-A
The cost of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be not less than 650 psi or a minimum compressive strength of 3500 psi.

Sheet piling shall not be driven until the concrete strength has attained a minimum flexural strength of 300 psi.

The minimum effective section modulus of the permanent steel sheet pile wall shall be 1 in. /ft.

Quantities shall be made for this substitution.

At the Contractor's option, a longer v bar may be ordered to replace the v bar. No reduction in bars indicated thus: 12 x 4-#5 etc. indicates 12 lines of bars with 4 lengths per line.

Notes:
- # of bars at 12” cts.
- # of bars at 6” cts.
- # of bars at 3” cts.
- # of bars at 1” cts.

Each Corner
2-# v bars

Top of Bott. Slab
-# a bars at 1” cts.

Bott. of Top Slab
-# a bars at 1” cts.

Top of Bottom Slab
-# h bars in 4” (Min. Lap)

Bott. of Bott. Slab
-# h bars in 3” (Min. Lap)

Cu. Yd.


The use of furnishing and installing the fabricated steel cap, elastomeric mat, and filter fabric shall be included in the cost of Permanent Steel Piling.
NOTES:

BARS INDICATED AS X, X, X ETC. INDICATES X TIMES X TIMES X EACH SIDE.

AT THE CONTRACTOR'S OPTION, SPECIAL BARS MAY BE ORDERED TO REPLACE X BARS. NO REDUCTION IN QUANTITIES SHALL BE MADE FOR THIS SUBSTITUTION.

THE MINIMUM EFFECTIVE SECTIONS MODULUS OF THE PERMANENT STEEL SHEET PILE WALL SHALL BE 4750 PSI (MINIMUM COMpressive STRENGTH OF 3500 PSI). SHEET PILING SHALL NOT BE DRIVEN UNTIL THE CONCRETE STRENGTH HAS ATTAINED A MINIMUM FLEXURAL STRENGTH OF 450 PSI PLUS A MINIMUM COMpressive STRENGTH OF 3500 PSI.

THE COST OF FURNISHING AND INSTALLING THE FABRICATED STEEL CAP, ELASTOMERIC MAT, AND FILTER FABRIC SHALL BE INCLUDED IN THE COST OF PERMANENT SHEET PILING.

THAT PILING (SPECIFIED) FOR THE MINIMUM EFFECTIVE SECTIONS MODULUS OF THE PERMANENT STEEL SHEET PILE WALL SHALL BE 4750 PSI (MINIMUM COMpressive STRENGTH OF 3500 PSI). THE COST OF FURNISHING AND INSTALLING THE FABRICATED STEEL CAP, ELASTOMERIC MAT, AND FILTER FABRIC SHALL BE INCLUDED IN THE COST OF PERMANENT SHEET PILING.

THE MINIMUM EFFECTIVE SECTIONS MODULUS OF THE PERMANENT STEEL SHEET PILE WALL SHALL BE 4750 PSI (MINIMUM COMpressive STRENGTH OF 3500 PSI). SHEET PILING SHALL NOT BE DRIVEN UNTIL THE CONCRETE STRENGTH HAS ATTAINED A MINIMUM FLEXURAL STRENGTH OF 450 PSI PLUS A MINIMUM COMpressive STRENGTH OF 3500 PSI.

THE COST OF FURNISHING AND INSTALLING THE FABRICATED STEEL CAP, ELASTOMERIC MAT, AND FILTER FABRIC SHALL BE INCLUDED IN THE COST OF PERMANENT SHEET PILING.

THAT PILING (SPECIFIED) FOR THE MINIMUM EFFECTIVE SECTIONS MODULUS OF THE PERMANENT STEEL SHEET PILE WALL SHALL BE 4750 PSI (MINIMUM COMpressive STRENGTH OF 3500 PSI). THE COST OF FURNISHING AND INSTALLING THE FABRICATED STEEL CAP, ELASTOMERIC MAT, AND FILTER FABRIC SHALL BE INCLUDED IN THE COST OF PERMANENT SHEET PILING.

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THE MINIMUM EFFECTIVE SECTIONS MODULUS OF THE PERMANENT STEEL SHEET PILE WALL SHALL BE 4750 PSI (MINIMUM COMpressive STRENGTH OF 3500 PSI). SHEET PILING SHALL NOT BE DRIVEN UNTIL THE CONCRETE STRENGTH HAS ATTAINED A MINIMUM FLEXURAL STRENGTH OF 450 PSI PLUS A MINIMUM COMpressive STRENGTH OF 3500 PSI.

THE COST OF FURNISHING AND INSTALLING THE FABRICATED STEEL CAP, ELASTOMERIC MAT, AND FILTER FABRIC SHALL BE INCLUDED IN THE COST OF PERMANENT SHEET PILING.