# Index 6040 Precast Concrete Sheet Pile Wall

## Design Criteria

***AASHTO LRFD Bridge Design Specifications***, 5th Edition; ***Structures Design Guidelines (SDG)***

## Design Assumptions and Limitations

These piles are typically jetted into place rather than driven like a bearing pile. If shallow rock formations exist within the wall limits, other wall types must be considered.

A cast-in-place reinforced concrete bulkhead cap is required to structurally tie the tops of the concrete sheet piles together and to provide corrosion protection for the reinforcing and prestressing steel that extend from the tops of the piles.

These piles can be used for cantilevered walls or tie-backed walls. Project specific designs and details are required for tie-backs. If the length of piles required for a cantilevered wall exceeds the limits shown on the standard drawings, consider using tie-backs.

These piles can be used in all environments with the appropriate concrete admixtures.

The grouted keyway used in combination with plastic filter fabric (the limits of both are defined by dimension "X") are assumed to not be watertight. Thus they contain the soil behind the wall while still allowing groundwater behind the wall to weep through. No other separate weep holes are generally required. The bottom of the "X" dimension is required to be 1'-8" below the mud line.

The tip elevation of piles shall be determined by the Geotechnical Engineer.

See additional information on the Standard Drawing.

## Plan Content Requirements

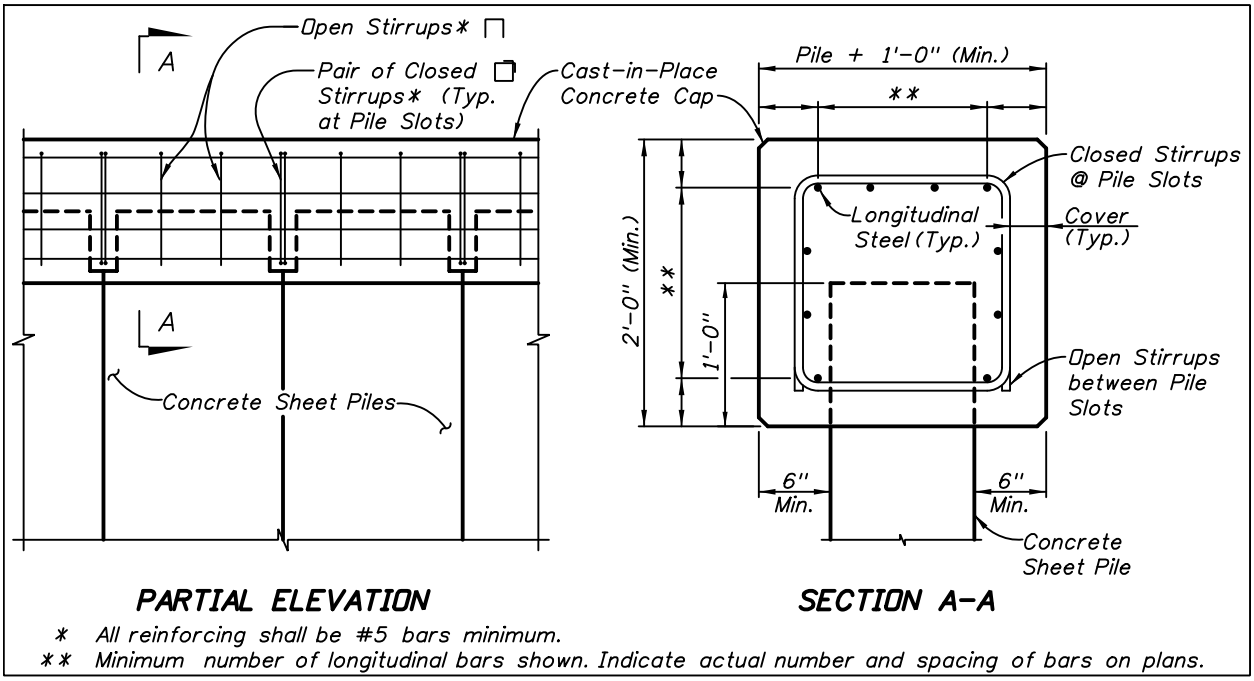
In the Structures or Roadway Plans:

Prepare Wall Control Drawings and related drawings as specified in ***SDM*** Chapter 19 and ***PPM*** Vol. 1, Chapter 30, and include them in the plans. Use combinations of straight and corner piles to accommodate project specific geometric requirements.

Show one Starter Pile location for a given wall. In the Elevation View, show the wall construction sequence proceeding away from the Starter Pile by locating the 11" by 11" corner clip on each Typical Pile on the side farthest away from the Starter Pile. Consider necessary tie-ins with adjacent structures when selecting the Starter Pile location.

Prepare project specific cast-in-place concrete bulkhead cap, tie-back and utility accommodation details and include them in the plans. See Figure 1 for typical cap details. In the Materials Note on the General Notes Sheet, specify the concrete class for the cast-in-place cap in accordance with the retaining wall environment classification. See ***SDG*** 1.4.

## Figure 1 Typical Cap Details




Complete the following "Anchored Concrete Sheet Pile Data Table" or "Cantilever Concrete Sheet Pile Wall Data Table" as applicable and include it on the supplemental sheets. Complete the Notes and add/modify/delete as necessary. See Introduction I.3 for more information regarding use of Data Tables.

| ANCHORED CONCRETE SHEET PILE WALL DATA TABLE | | | | | | | | | | | | | | | | | | | Table Date 01-01-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONSTRUCTION INFORMATION | | | | | | | | | | | | | | DESIGN PARAMETERS | | | | | |
| WALL LOCATION | | WALL NO. | CONCRETE SHEET PILE | | | | | | ANCHORS | | | MINIMUM WALL TIP ELEVATION (ft.) | TOP OF WALL ELEV. (ft.) | SOIL ELEVATION | | WATER ELEVATION | | DESIGN LIVE LOAD (psf) |
| STATION (begin to end) | OFFSET (ft.) | | TYPE (See Detail A) | NUMBER REQUIRED | PILE LENGTH L (ft.) | PILE THICKNESS T (in.) | GROOVE LENGTH X (ft.) | CORNER ANGLE Ø (degrees) | MAXIMUM ANCHOR SPACING (ft.) | REQUIRED ANCHOR RESISTANCE (kips/ft) | ** SOIL ANCHOR MINIMUM UNBONDED LENGTH (ft.) | | | FRONT OF WALL (ft.) | BACK OF WALL (ft.) | FRONT OF WALL (ft.) | BACK OF WALL (ft.) | |
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** Not applicable for deadman type anchors.

NOTES:
1. Work the Data Table with Index No. 6040.
2. Anchor Design Load = Required Anchor Resistance (kips/ft) x Anchor Spacing (ft).
3. Environmental Classification is _____
4. Concrete for cast-in-place retaining wall caps shall be Class _____ (f'c = _____ psi), with/without silica fume, metakaolin or ultrafine fly ash.

| ESTIMATED QUANTITIES | | | |
|---|---|---|---|
| WALL NO. | ITEM | UNIT | QUANTITY |
| 1 | Concrete Sheet Piling, #X# | LF | ## |
| | Concrete Class ##, Bulkhead | CY | ## |
| | Reinforcing Steel - Bulkhead | LB | ## |
| | | | |
| | | | |
| 2 | Concrete Sheet Piling, #X# | LF | ## |
| | Concrete Class ##, Bulkhead | CY | ## |
| | Reinforcing Steel - Bulkhead | LB | ## |
| | | | |
| | | | |

| CANTILEVER CONCRETE SHEET PILE WALL DATA TABLE | | | | | | | | | | | | | | | | Table Date 01-01-11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONSTRUCTION INFORMATION | | | | | | | | | | | DESIGN PARAMETERS | | | | | |
| WALL LOCATION | | WALL NO. | TYPE (See Detail A) | NUMBER REQUIRED | PILE LENGTH L (ft.) | PILE THICKNESS T (in.) | GROOVE LENGTH X (ft.) | CORNER ANGLE Ø (degrees) | MINIMUM WALL TIP ELEVATION (ft.) | WALL TOP ELEV. (ft.) | SOIL ELEVATION | | WATER ELEVATION | | DESIGN LIVE LOAD (psf) |
| STATION (begin to end) | OFFSET (ft.) | | | | | | | | | | FRONT OF WALL (ft.) | BACK OF WALL (ft.) | FRONT OF WALL (ft.) | BACK OF WALL (ft.) | |
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NOTES:
1. Work the Data Table with Index No. 6040.
2. Environmental Classification is _____
3. Concrete for cast-in-place retaining wall cap shall be Class _____ (f'c = _____ psi), with/without silica fume, metakaolin or ultrafine fly ash.

| ESTIMATED QUANTITIES | | | |
|---|---|---|---|
| WALL NO. | ITEM | UNIT | QUANTITY |
| 1 | Concrete Sheet Piling, #X# | LF | ## |
| | Concrete Class ##, Bulkhead | CY | ## |
| | Reinforcing Steel - Bulkhead | LB | ## |
| 2 | Concrete Sheet Piling, #X# | LF | ## |
| | Concrete Class ##, Bulkhead | CY | ## |
| | Reinforcing Steel - Bulkhead | LB | ## |

## Payment

| Item number | Item description | Unit Measure |
|---|---|---|
| 400-2-8 | Concrete Class II, Bulkhead | CY |
| 400-3-8 | Concrete Class III, Bulkhead | CY |
| 400-4-8 | Concrete Class IV, Bulkhead | CY |
| 415-1-8 | Reinforcing Steel - Bulkhead | LB |
| 415-2-8 | Reinforcing Steel - Stainless, Bulkhead | LB |
| 455-14-AA | Concrete Sheet Piling | LF |