# Index 6040 Precast Concrete Sheet Pile Wall (Rev. 07/13)

## **Design Criteria**

AASHTO LRFD Bridge Design Specifications, 6th 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 tied-back 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.

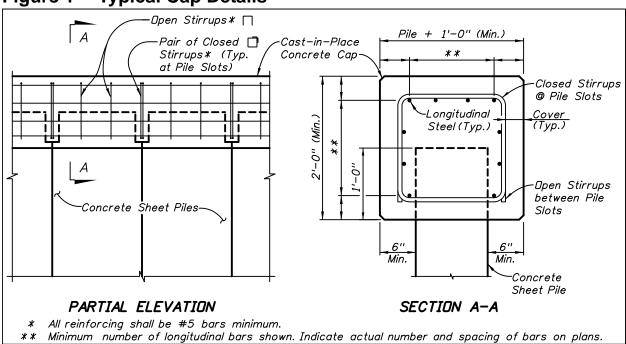
## **Plan Content Requirements**

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 and other boundary restrictions 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.



Topic No. 625-010-003-j

2014

#### Figure 1 Typical Cap Details

Complete the following "Concrete Sheet Pile Wall with Prestressed Soil Anchors Data Table", "Concrete Sheet Pile Wall with Dead Man Anchors Data Table" or "Concrete Sheet Pile Wall, Cantilever 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.

	CONCRETE SHEET PILE WALL WITH PRESTRESSED SOIL ANCHORS DATA TABLE															Table Date 07-01-1			
CONSTRUCTION INFORMATION											DESIGN PARAMETERS				IS				
			CONC	RETE SHEET	PILE FABRIC	ATION			ANCI	HORS					SOIL				
TION															ELEVATION		ELEVATION		
		TYPE		PILE LENGTH	PILE THICKNESS	GROOVE LENGTH	CORNER ANGLE	MAXIMUM ANCHOR	FACTORED ANCHOR	SERVICE ANCHOR	MINIMUM UNBONDED	ANGLE BELOW	ANGLE MINIMUM BELOW WALL TIP	TOP OF WALL	OF	OF	OF	OF	F SURCHARGE
(ft)	NO.	(See Detail A)	REQUIRED	(ft)	(in)	(ft)	(degrees)	(ft)	(kips/ft)	(kips/ft)	(ft)	HORIZONTAL EI (degrees)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(psf)
	OFFSET	OFFSET WALL	OFFSET WALL (See	ION OFFSET WALL (See NUMBER	ION OFFSET WALL TYPE NUMBER PILE USE NUMBER LENGTH	ION OFFSET WALL TYPE NUMBER PILE PILE See NUMBER PILE LENGTH THICKNESS	ION OFFSET WALL TYPE NUMBER PILE PILE GROOVE (See NUMBER LENGTH THICKNESS LENGTH	TION OFFSET WALL CSee NUMBER PILE PILE FABRICATION CONCRETE SHEET PILE FABRICATION PILE PILE PILE LENGTH THICKNESS GROOVE CORNER LENGTH O NUMBER CONCRETE SHEET PILE FABRICATION	ION OFFSET WALL TYPE NUMBER PILE PILE FABRICATION TYPE NUMBER PILE PILE FABRICATION PILE PILE FABRICATION PILE PILE SGROOVE CORNER MAXIMUM THICKNESS X 0 0 SPACING SPACING	ION OFFSET WALL (See NUMBER L L L L L L L L L L L L L L L L L L L	ION OFFSET WALL (See NUMBER LENGTH CALL LANGE NUMBER LENGTH CALL LANGE SERVICE ANGLE ANGL	ION TYPE NUMBER FILE FABRICATION ANCHORS	ION VALL (See NUMBER L L LENSTH HILE FABRICATION ANCHORS INSTALLATION ANCHOR SUBJECT OF SERVICE MINIMUM FACTORED SERVICE MINIMUM ANGLE BELOWSTH ANGLE ANCHOR	ION VALL CONCRETE SHEET PILE FABRICATION ANCHORS	ION VALL (See NUMBER LEVATION ELEVATION ANCHOR SERVICE MINIMUM ANGLE MINIMUM FACTORED ANCHOR	ION VALL CSee NUMBER L L T T X LLATION LEV. VALL	ION VALL (See NUMBER LEVATION LEV. VALL LTP VALL (See NUMBER LEVATION LTT T T CONCRETE SHEET PILE FABRICATION ANGLE ANGL	ION ALL VALL VALL VALL VALL VALL VALL VALL	$\begin{tabular}{ c c c c c c c } \hline \hline & & & & & & & & & & & & & & & & & $

\* Minimum of Design Ground Surface or Design Scour Depth.

#### NOTES:

CONSTRUCTION INFORMATION												DESIGN PARAMETER				₹5	
			CONCRETE SHEET PILE FABRICATION						ANCHORS				SOIL ELEVATION		WATER ELEVATION		
WALL LOCA	TION											TOP OF WALL ELEV. (ft)	*				FACTORED
STATION (begin to end)	OFFSET (ft)	WALL NO.	TYPE (See Detail A)	NUMBER REQUIRED	PILE LENGTH L (ft)	PILE THICKNESS T (in)	GROOVE LENGTH X (ft)	CORNER ANGLE Ø (degrees)	ANCHOR BAR SPACING (ft)	ANCHOR BAR DIAMETER (in)	MINIMUM WALL TIP ELEVATION (ft)		FRONT OF WALL (ft)	BACK OF WALL (ft)	FRONT OF WALL (ft)	BACK OF WALL (ft)	DESIG SURCHAR LOAD (psf)
																	<u> </u>

\* Minimum of Design Ground Surface or Design Scour Depth.

#### NOTES:

CONCRETE SHEET PILE WALL, CANTILEVER DATA TABLE														Table Date 07-01-12			
	CONSTRUCTION INFORMATION														AMETERS		
WALL LOCATION											SOIL ELEVATION		WATER ELEVATION				
STATION (begin to end)	OFFSET (ft)	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)	FRONT OF WALL (ft)	BACK OF WALL (ft)	FRONT OF WALL (ft)	BACK OF WALL (ft)	DESIGI LIVE LOAD (psf)		

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 \_\_\_\_\_(trc = \_\_\_\_psi), \_\_\_\_\_\_(with/without) silica fume, metakaolin or ultrafine fly ash.

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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
451-70-AA	Prestressed Soil Anchor	EA
455-14-AA	Concrete Sheet Piling	LF
455-87	Anchor Bar, Steel	EA