# Index 6040 Precast Concrete Sheet Pile Wall

## **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.

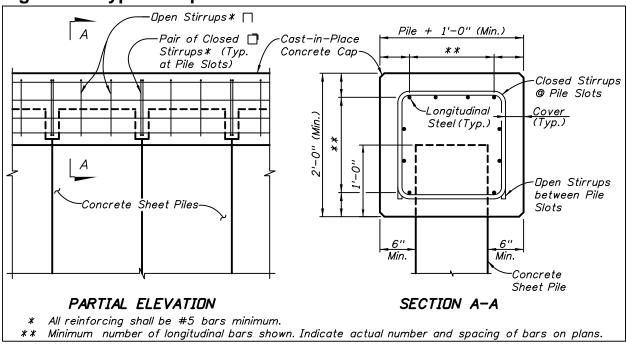
## **Plan Content Requirements**

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.



#### 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	Table Date 07-01-1				
CONSTRUCTION INFORMATION													DESIGI	METER	15			
		солс	RETE SHEET	PILE FABRIC.	ATION			ANCI	HORS					SOIL ELEVATION				
WALL NO.	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)	FACTORED ANCHOR LOAD (kips/ft)	SERVICE ANCHOR LOAD (kips/ft)	MINIMUM UNBONDED LENGTH (ft)	INST ALLATION ANGLE BELOW HORIZONTAL (degrees)	MINIMUM WALL TIP ELEVATION (ft)	TOP OF WALL ELEV. (ft)	* FRONT OF WALL (ft)	BACK OF WALL (ft)	FRONT OF WALL (ft)	BACK OF WALL (ft)	SURCHAR
																		<u> </u>
		WALL (See	TYPE WALL (See NUMBER	CONCRETE SHEET PILE LENGTH VALL (See NUMBER L	CONSTRUC CONCRETE SHEET PILE FABRIC PILE PILE LENGTH THICKNESS THICKNESS T	CONSTRUCTION INF	CONSTRUCTION INFORMATION CONCRETE SHEET PILE FABRICATION PILE PILE PILE GROOVE CORNER LENGTH THICKNESS LENGTH ANGLE VALL (See NUMBER L V	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION  TYPE PILE PILE PILE GROOVE CORNER MAXIMUM ANCHOR SPACING SPACING	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION ANCI  TYPE PILE PILE PILE PILE GROOVE CORNER MAXIMUM FACTORED ANCHOR ANCHOR ANCHOR LENGTH T X 0 SPACING LOAD	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION ANCHORS  TYPE PILE PILE PILE PILE PILE GROOVE CORNER ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR LOAD LOAD LOAD	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION ANCHORS  TYPE PILE PILE PILE FABRICATION PILE PILE GROOVE CORNER ANCHOR ANCHO	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION ANCHORS  CONCRETE SHEET PILE FABRICATION PILE PILE PILE PILE PILE GROOVE CORNER MAXIMUM FACTORED SERVICE MINIMUM UNBONDED DEL SPACING LOAD LOAD LENGTH HORIZONTAL	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION ANCHORS  INSTALLATION PILE PILE PILE PILE PILE FILE SGROOVE CORNER ANCHOR ANCHOR SERVICE NUMBER I SERVICE NUMBER I SERVICE NUMBER I SERVICE INSTALLATION ANGLE SERVICE INSTALLATION	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION ANCHORS  CONCRETE SHEET PILE FABRICATION PILE PILE PILE PILE GROOVE CORNER MAXIMUM FACTORED SERVICE MINIMUM UNBONDED BELOW WALL TIP WALL CSee NUMBER L L ST T S S S S S S S S S S S S S S S	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION  ANCHORS  CONCRETE SHEET PILE FABRICATION  CORNER  PILE PILE PILE PILE GROOVE CORNER MAXIMUM FACTORED SERVICE MINIMUM NAGLE BELOW WALL TP WALL V SPACING LOAD LOAD LENSTH HORIZONTAL LEIVATION	CONSTRUCTION INFORMATION DESIGN CONCRETE SHEET PILE FABRICATION ANCHORS CONCRETE SHEET PILE FABRICATION FOR FILE PILE PILE PILE PILE FILE GROOVE CORNER ANCHOR FACTORED SERVICE MINIMUM ANCHOR NOCHOR ANCHOR	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION  CONCRETE SHEET PILE FABRICATION  CONCRETE SHEET PILE FABRICATION  ANCHOR  CORNER  ANCHOR  SERVICE  MINIMUM  ANGLE  BELOW  CORNER  ANCHOR  ANCHOR ANCHOR  ANCHOR  ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANCHOR ANC	CONSTRUCTION INFORMATION  CONCRETE SHEET PILE FABRICATION  CONCRETE SHEET PILE FABRICATION  CONCRETE SHEET PILE FABRICATION  CONCRETE SHEET PILE FABRICATION  ANCHOR  CONCRETE SHEET PILE  PILE

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

#### NOTES:

CONCRETE SHEET PILE WALL WITH DEAD MAN ANCHORS DATA TABLE																	
CONSTRUCTION INFORMATION												DESIGN PARAME				TERS	
				CONCRETE SHEET PILE FABRICATION						ANCHORS			SOIL		WATER		
WALL LOCA	TION											TOP OF WALL	ELEVATION		ELEVATION		1
			TYPE		PILE LENGTH	PILE THICKNESS		CORNER ANGLE	ANCHOR BAR	ANCHOR BAR	MINIMUM WALL TIP		* FRONT OF	OF	FRONT OF	BACK OF	SURCHAR
STATION (begin to end)			(See Detail A)	NUMBER REQUIRED	L (ft)	T (in)	X (ft)	Ø (degrees)	SPACING (ft)	DIAMETER (in)	ELEVATION (ft)	ELEV. (ft)	WALL (ft)	WALL (ft)	WALL (ft)	WALL (ft)	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													V PARA	AMETERS		
WALL LOCA	ALL 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)	DESIGN 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 \_\_\_\_\_\_(rc = \_\_\_\_\_psi), \_\_\_\_\_\_(with/without) silica fume, metakaolin or ultrafine fly ash.

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