WORK INSTRUCTIONS FOR ENGINEERS

Compiled by : NHB

Checked by : LSS

Approved by : GSS

OP-3-40. CHECKLIST FOR BORED CAST-IN-PLACE PILE

40.0 CHECKLIST FOR BORED CAST-IN-PLACE PILE

	CHECKLIST ITEMS	Checked By Engineer	Remarks
	Project Name : _____ **Piling Contractor** : _____		
1.0	**CONSTRUCTION METHOD AND TECHNIQUES**		
	• Pile Diameter _____ • Concrete Grade _____ • Pile Raked Gradient _____ Vertical : _____ Horizontal		
	• Grab Construction (Using Crawler Crane, Casing Oscillator, etc) • Rotary Drilling (Contiguous Flight Auger, Twin Head Rotary Drive) • Rock Coring (Chisel, Core Barrel, Cross Head Cutter, Reamer, etc.)	❑ ❑ ❑	
	• Direct Circulation Drill • Indirect Circulation Drill	❑ ❑	
	Concreting Method • Poured (With Tremie for Wet Hole Construction) • Injected	 ❑ ❑	
	Reinforcement • Reinforcement Cage : Main _____ Link _____ (eg. 32T20) (eg. T12 @ 150 Spiral) [Note: T = 460 N/mm2 , Y = 410 N/mm2 , R = 250 N/mm2] • Lapping Length : _____ • Concrete Cover/ Spacer : _____		
2.0	**PILING EQUIPMENT AND ACCESSORIES**		
	Excavator: • Crawler Crane (Grab method) • Rotary Drive (Continuous Flight Auger, Twin Rotary Head)		
	• Temporary Casing		
	• Drilling Fluid (Bentonite or other Slurry Stabilisation)		
	• Concrete Tremie Pipe (for concreting under water or wet hole) • Hover with short length of chute (direct discharge method for dry hole)	❑ ❑	
3.0	**PILE POSITION SETTING UP**		
	• Three reference points to be setup with respect to the proposed pile point.		

4.0	**BORED PILE CONSTRUCTION**		
	Predrilling • To determine the bored pile length • To check verticality of borehole • To check any deviation in the distance of pile point to the reference points after soil boring.		
	Stability Of Borehole • Temporary steel casing with appropriate size and length (minimum 1m or below the unstable strata) should be applied to prevent loose materials falling into the bottom of borehole. • Borehole to be filled with drilling fluid to stabilise the borehole [See note ##] unless stiff clayey soils are encountered.		
	Verification Of Bedrock (If Required) • Inspection of the excavated rock fragments • The depth achieved (rock encountered / total length) to be compared with the borehole data and checked by a measurement tape. • The bottom soundness is checked with a weight on a tape tamped on the founding strata. • In-situ rock strength test (e.g. Point Load Test) to be conducted [See note ##]		
	Airlifting (Base Cleaning) • Use cleaning bucket to clean the base before carrying out air lifting. • To ensure the cleanliness of the loose and caving-in soil at base. • Make sure the hose is at the base of the pile (not suspended half-way).		
	Reinforcement Cage • The length of the cages should match with the excavated depth. • Insert fabricated reinforcement cage into the cased borehole		
	Check Lap length (if any)	❑	
5.0	**CONCRETING**		
	• Concrete overbreak after each batch of concreting • Pour in concrete (by tremie concrete method or direct discharge method), simultaneously displacing slurry. • Check the density of fluid as in the specification. • The bottom end of the tremie pipe should be always about one to two metres submerged below the level of the concrete. (Not to pull up too abrupt) • Concreting could only be stopped at about 1m above the cut-off level • Record any interruption on concreting (record the duration) • Test Cube : o at least 6 Nos. o achieve design strength (within 28 days)		

	• Concrete Slump Test
	• Record :
	  o Number of trucks
	  o Discharge amount per trucks		

6.0	**PROOF DRILLING**		
	Core drilling to be carried out through piles to check the qualities of • Concrete • Contact between the rock and concrete • Quality of the rock beneath the toe		
7.0	**CHECK BORED PILE SHAFT INTEGRITY**		
	• Use High Strain Dynamic Load Test (HSDLT) • Pile Integrity Test (PIT). • Sonic Logging	❑ ❑ ❑	
8.0	**POST-INSTALLATION**		
	Penetration length • Piling Platform level : _____ • Borehole Drilling Record : _____ • Predicted Length at site : _____ (from HSDLT or PIT)		
	Compared penetration lengths with Borehole or Proof Drilling from Subsurface Investigation.		
	Check As-built position of the bored pile group (Typically eccentricity < 75mm)		
9.0	**COMPUTATION** Estimate the amount of concrete and materials for each piles.		
	Signature by Engineer		

Note : [##] represents the items that will be followed if only necessary.