

### **WORK INSTRUCTIONS FOR ENGINEERS**

Compiled by:	NHB
Checked by :	LSS
Approved by:	GSS

CH-016. CHECKLIST FOR BORED CAST-IN-PLACE PILE

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CHECKLIST FOR BORED CAST-IN-PLACE PILE

### 16.0 CHECKLIST FOR BORED CAST-IN-PLACE PILE

	CHECKLIST ITEMS	Checked By Engineer	Remarks
	Project Name :		
1.0	CONSTRUCTION METHOD AND TECHNIQUES		
	<ul> <li>Pile Diameter</li> <li>Concrete Grade</li> <li>Pile Raked Gradient Vertical : Horizontal</li> </ul>		
	<ul> <li>Grab Construction (Using Crawler Crane, Casing Oscillator, etc)</li> </ul>		
	<ul> <li>Rotary Drilling (Contiguous Flight Auger, Twin Head Rotary Drive)</li> </ul>		
	<ul> <li>Rock Coring (Chisel, Core Barrel, Cross Head Cutter, Reamer, etc.)</li> </ul>		
	Direct Circulation Drill     Indicate Circulation Drill		
	Indirect Circulation Drill		
	<ul> <li>Concreting Method</li> <li>Poured (With Tremie for Wet Hole Construction)</li> <li>Injected</li> </ul>		
	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:		
	<ul> <li>All measuring devices (ruler, measuring tape, spirit bubble and etc.) shall be checked and verified.</li> </ul>		
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)		
	<ul> <li>Concrete Tremie Pipe (for concreting under water or wet hole)</li> </ul>		
	<ul> <li>Hover with short length of chute (direct discharge method for dry hole)</li> </ul>		
3.0	PILE POSITION SETTING UP		

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#### CHECKLIST FOR BORED CAST-IN-PLACE PILE

Three reference points to be setup with respect to the proposed pile point.  BORED PILE CONSTRUCTION  Predrilling To determine the bored pile length To check verticality of borehole 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 fin 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 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-situr rock strength test (e.g. Point Load Test) to be conducted [See note ##]  Verification of Bedrock (Limestone) The piling works have commenced from the lowest anticipated rock head of competent bedrock within the same pile group. The design of rock socket lengthening has considered the situation of large differences in rock levels within the same pile group and adjacent single pile group. A virtual plane is projected from the lowest rock level along the circumferential line of 2.5 or 2.0 times pile diameter, from the pile centreline. The point of intersection between the projected line and the pile centreline is taken as the highest effective rock commencement level, as indicated in the following sketch:				
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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 ##]  Verification of Bedrock (Limestone)  The piling works have commenced from the lowest anticipated rock head of competent bedrock within the same pile group.  The design of rock socket lengthening has considered the situation of large differences in rock levels within the same pile group and adjacent single pile group. A virtual plane is projected from the lowest rock level along the circumferential line of 2.5 or 2.0 times pile diameter, from the pile centreline. The point of intersection between the projected line and the pile centreline is taken as the highest effective rock commencement level, as indicated in the following sketch:  BERROCK (CANTY-FREE))  BERROCK (CANTY-FREE))  BERROCK (CANTY-FREE))  BERROCK (CANTY-FREE))				
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anticipated rock head of competent bedrock within the same pile group.  The design of rock socket lengthening has considered the situation of large differences in rock levels within the same pile group and adjacent single pile group. A virtual plane is projected from the lowest rock level along the circumferential line of 2.5 or 2.0 times pile diameter, from the pile centreline. The point of intersection between the projected line and the pile centreline is taken as the highest effective rock commencement level, as indicated in the following sketch:  BEDROCK PROPILE  FEFECTIVE ROCK SOCKET (ROCK HEAD OF COMPETENT BEDROCK (CAVITY-FREE))  BEDROCK (CAVITY-FREE))  ANGLE OF VIRTUAL PLANE		Verification of Bedrock (Limestone)		
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The tabulation of estimated rock head levels of competent bedrock (cavity-free) for each bored pile have been		situation of large differences in rock levels within the same pile group and adjacent single pile group. A virtual plane is projected from the lowest rock level along the circumferential line of 2.5 or 2.0 times pile diameter, from the pile centreline. The point of intersection between the projected line and the pile centreline is taken as the highest effective rock commencement level, as indicated in the following sketch:    BPT		

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	compared with the actual rock head level encountered during rock coring.					
	during rock coring.					
	Bored Pile Ref.	Estimated Rock Head of Competent Bedrock (Cavity-free) (RL)	Actual Rock Head of Competent Bedrock (Cavity-free) (RL)(Note <sup>3</sup> )	Status (Note <sup>1&amp;2</sup> )		
	BP 001-1	50.00	49.00	Acceptable		
	BP 001-2	50.10	51.50	Acceptable		
	BP 001-3	50.20	47.00	Not Acceptable		
	BP 001-4	50.30	53.00	Not Acceptable		
	Note 1: Variations of ±2 meters between the estimated and actual rock head (cavity free) are considered acceptable; deviations beyond this threshold must be brought to the Engineer's attention (subjected to the Project Director's confirmation).  Note 2: Minimum one (1) verification rock probe shall be drilled if the variation exceeds ±2 meters (subjected to the Project Director's confirmation).  Note 3: To be tabulated during rock coring for bored piling works.					
	Airlifting (Base Cleaning)					
	<ul> <li>Use clear</li> <li>air lifting</li> </ul>		ean the base before o	carrying out		
	<ul> <li>To ensu base.</li> </ul>	re the cleanliness	of the loose and cav	ing-in soil at		
	Make su half-way		the base of the pile (r	not suspended		
	Reinforcem	ent Cage				
	<ul> <li>The length of the cages should match with the excavated depth.</li> </ul>					
	<ul> <li>Insert fa</li> </ul>	bricated reinforce	ment cage into the ca	ased borehole		
	and fabr	rication of sonic lo	ng insertion of reinfor gging tube and during ately blocking the so	g lowering to	) [	
	Check Lap I	ength (if any)				
5.0	CONCRETING					
	<ul> <li>Concret</li> </ul>	e overbreak after	each batch of concre	ting		
	discharg	ge method), simult	ie concrete method o taneously displacing a as in the specification	slurry.		
		•	mie pipe should be al			
	one to t		rged below the level of			
	<ul> <li>Concret cut-off le</li> </ul>		stopped at about 1m	above the		
	<ul> <li>Record</li> </ul>	any interruption of	n concreting (record t	he duration)		

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#### CHECKLIST FOR BORED CAST-IN-PLACE PILE

	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.

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CHECKLIST FOR BORED CAST-IN-PLACE PILE

# **R&D DOCUMENT REVISION LOG**

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REV	VERSION	DATE	LOGGER	AMENDMENTS
0	0	-	-	-
1	1	03/05/2022	-	-
2	2	05/03/2025	NAA	Add in Item 4.0 Verification of Bedrock (Limestone)