PILE RECORD FOR FRICTION PILES USING FHWA MODIFIED GATES METHOD

Pile No.	Project Hammer Number	Pile Cut-off Elevation	Pile Length In Place	Estimated Pile Tip Elevation	Highest Allowable Pile Tip Elevation	Pile Tip Elevation As Driven	Design Factored Axial Load		Required Nominal Axial Resistance		Hammer Fuel Setting at EOD	Actual at EOD (Last 10 Blows)					
												Set	Actual No. of Blows	Blow Count (N)	Hammer Stroke (H)	Developed Hammer Energy (E)	*Calculated Nominal Axial Resistance (Rn)
		FEET	FEET	FEET	FEET	FEET	KIPS	TONS	KIPS	TONS		INCH		BLOWS PER INCH	FEET	FT-LBS	TONS
INTEGRAL END BENT #1																	
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
PIER #1																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
PIER #2																	
17																	
18																	
19																	
20																	
21																	
22																	
23																	
24																	
INTEGRAL END BENT #2																	
25																	
26																	
27																	
28																	
29																	
30																	
31																	
32																	

* The Modified Gates Formula is only applicable at the End of Drive (EOD) and may not be applied at Beginning of Restrike (BOR).

Definitions of Terms

PILE CUT-OFF ELEVATION: Elevation of the top of pile in the finished structure.

PILE LENGTH IN PLACE: Actual pile length below the Pile Cut-Off Elevation in the finished structure.

PILE TIP ELEVATION AS DRIVEN: Actual Pile Tip elevation in the finished structure.

DESIGN FACTORED AXIAL LOAD: The design factored strength loads as estimated from structural design calculations.

REQUIRED NOMINAL AXIAL RESISTANCE: The total geotechnical axial resistance required by the pile to satisfy applicable design requirements. This is arrived at by dividing the Design Factored Axial Load by the resistance factor, $\phi = 0.40$, plus any other applicable considerations such as scour, embankment layers, etc. Note that dynamic formulas, including the FHWA Modified Gates Formula, should not be used when the required nominal axial resistance exceeds 600 kips.

END OF DRIVING (EOD): When the pile was driven to tip elevation.

HAMMER STROKE (H): The length of the free-fall of the ram for a gravity, diesel or single-acting steam or compressed air hammer.

DEVELOPED HAMMER ENERGY (E): This is the energy of the ram impact for a given blow. If a direct energy reading is not taken, "E" can be assumed to be the ram weight (in pounds) times the hammer stroke (in feet). (E=WH) ft-lbs.

SET: Amount of downward veritical displacement in the pile over the last 10 blows.

BLOW COUNT (N): Number of hammer blows per inch at the end of initial driving to be taken as 10 blows divided by the Set in inches.

FHWA MODIFIED GATES FORMULA: Calculated Nominal Pile Resistance $Rn = 0.875\sqrt{E}\log_{10}(10N) - 50$ Resulting value is in tons. The Modified Gates Formula is only applicable at the End of Drive (EOD) and may not be applied at Beginning of Restrike (BOR).

Driving Criteria

Satisfy two criteria when driving friction piles:

1. Drive piles to the Highest Allowable Pile Tip Elevation
2. Drive piles until the Calculated Nominal Pile Resistance (Rn) is equal to the Required Nominal Pile Resistance at End of Driving (EOD).

Hammer fuel setting shall be adjusted so that the blow count at the end of driving ranges from 3 to 10 blows per inch.

If the Calculated Nominal Pile Resistance (Rn) is achieved at an elevation higher than the Highest Allowable Pile Tip Elevation, continue driving until the Highest Allowable Pile Tip Elevation is reached. If the pile cannot be advanced to the Minimum Point of Pile Elevation or if the pile is being driven "significantly" past the Estimated Pile Tip Tip Elevation, consult the Central Office Division of Construction.

Project Hammer Number	Hammer Manufacturer and Model	Weight of Ram W Lbs.	Maximum Rated Energy Ft-Lbs

Field Data

For each pile, the Project Engineer shall record all applicable data in the Pile Record for Friction Piles Sheet.

Submit this record to:

Kentucky Transportation Cabinet
Division of Structural Design
3rd. Floor East
200 Mero Street
Frankfort, KY 40622

This pile record does not replace other pile records the Project Engineer is required to keep and submit.

Include notes on the hammer size from the Geotech Report.

Use 14" Reinforced Concrete Piles in accordance with BPC-002, c.e.
Use 14" Precast Prestressed Concrete Piles in accordance with BPC-011, c.e.
Use HP 12x53 in accordance with BPS-003, c.e.
Use HP 14x73 in accordance with BPS-009, c.e.
Use HP 14x89 in accordance with BPS-011, c.e.
Use XX" Pipe Piles with x/x" wall thickness.

REVISION	DATE

DATE:	CHECKED BY
DESIGNED BY:	
DETAILED BY:	

Commonwealth of Kentucky
DEPARTMENT OF HIGHWAYS

COUNTY

ROUTE | CROSSING

ITEM NUMBER

PREPARED BY | SHEET NO. | DRAWING NO.