Generic Specification (11-6)

Owner responsible to “estimate” pile lengths

Contractor responsible to provide and install undamaged piles.

Must satisfy minimum required depth of embedment

Must drive to required ultimate capacity, w/ reasonable BC
Approved Hammers (11-9)

OED Measure Stroke (11-10)

CED Bounce Chamber Pressure (11-10)
Approval of Pile Driving Equipment (11-11)

Wave Equation Equipment Form (11-14)

Reasonable Blow Count
30-120 bpf (11-15)

Driving Stresses (11-15, chap 10)

Concrete (f'c, f_{pe})

Steel (f_y)
Grade 50 ksi
ASD Factors of Safety (11-16)

Ultimate Pile Capacity (i.e. “target” capacity must be shown on Plans: ASD Or LRFD

Optimum Pile Installation - Maximum Curvature (11-17)
Drive System Components (11-19)

Hammer Cushion (11-19)

Pile Cushion w/ concrete piles (11-20)

New Pile Cushion for each Pile
Used Pile Cushion for Re-Strikes

Leads (11-21)
Hammer Cushions

• Are materials placed between the pile hammer ram and the helmet

• It’s function?

  To relieve impact shock and thereby protect the hammer while at the same time transmit consistent energy to the pile
## Hammer Cushions

**Recommended:**
- Man-made cushion materials made of micarta, nylon, urethane, or other polymers

**Not Recommended:**
- Hardwood
- Plywood
- Wire rope
- Asbestos
Pile Cushion

• Concrete piles require a pile cushion between the helmet and the pile lead

• Typically made of plywood, hardwood, plywood & hardwood composites, or other man-made materials
Followers (11-21) Only with Engineer’s Approval

Jets (11-22) Only with Engineers Approval

Pre-Boring (11-22) Only with Engineers Approval
Follower

• Is a member interposed between a pile hammer and a pile to transmit blows when the pile head is below the reach of the hammer.

• Use of a follower is accompanied by a loss of energy delivered to the pile due to compression of the follower & losses in connection.
Jetting

- The use of a water or air jet to facilitate pile driving by displacing parts of the soil.

- Jetting is useful in driving piles through very dense material.
Predrilling

• Soil augers or drills used where jetting is inappropriate / ineffective to
  - Penetrate obstructions, boulders, debris fills
  - Facilitate pile placement through embankments
  - Reduce ground movements

• Predrilled hole diameter 100 mm less than diagonal of square pile, or 25 mm less than diameter of round pile
Gates Formula - limited (11-23)

Phase in WEAP (11-25)

Static Load Tests (11-26 & 27)

Include Dynamic Testing (11-28)

Contractor Responsibilities (11-29)

Restrike (11-30)

Duration

Cold Hammer
Tolerances (11-35)
Pile Heave (11-35)
Installation Sequence (11-36)
Unsatisfactory Piles (11-36)
Pay Items (11-40)
ANY QUESTIONS?