Your Role as an Inspector Checklist

For every project, there are various phases or steps in which you, as the inspector, are involved and play a role. From familiarizing yourself with the project plans to recording information for pay quantities, you have an important role to fulfill.

Below is a checklist of the various phases that an inspector is typically involved in.

Note that some specifications described in the following content may not be the same as the specifications followed by your agency. Always check with your State agency's standards and specifications when using these guidelines.

Sections

- **Know the Project Plans**
- **Assemble Your Tool Box**
- **Contractor Arrives On Site**
- **Equipment Set Up**
- **Piles Arrive On Site**
- **Pile Driving**
- **When to Stop**
- **Pay**

Know the Project Plans

- ❑ **The various documents you need to become familiar with are plans, structure plans, and specifications**
- ❑ **The project plans and specifications are the instruments by which the contractor will construct the project**
- ❑ **The plans and specifications may be divided into two categories:**

- Standard drawings and standard specifications and supplemental specifications
- Project specific drawings, specifications, and technical special provisions (technical special provisions override the standard specifications)

- ❑ **Pile driving plans will show the locations, capacities, sizes, type of piles, and batter angle**
- ❑ **Not all of the plans will pertain to the pile driving operation, however, some of the plans that first do not appear to be specifically needed for the pile driving operation can, nonetheless, be useful**
- ❑ **Also part of the plans set for the project are the structure plans, which contain the majority of the "technical" information that you need, including:**
  - Cutoff elevations
  - Scour elevations
  - Pile data
- ❑ **Review the structure plans and become familiar with the information**
- ❑ **Review and become intimately familiar with the project specifications**
- ❑ **It is important for you to understand the governing order of specifications, as certain specifications, such as technical special provisions, override the standard specifications**
- ❑ **Always make sure you know which version of the standard specifications is applicable to your project**

Assemble Your Tool Box

- ❑ **There are certain "tools" that you need to do your job properly. Without some of these, you really can't do your job.**
- ❑ **Forms**
  - Daily Report of Construction
  - Pile Driving Record
- ❑ **Tools**

- Hard hat
- Boots
- Ear protection
- Scale
- Pen/pencil (with a spare)
- 12-ft. tape (preferably 20 ft.)
- Life jacket or reflective jacket
- Watch
- Calculator
- Camera
- Level
- 9-volt batteries
- Builders square
- 150-ft. tape

❑ **Information**

- Project plans and specifications
- Special provisions and technical special provisions
- Pile installation plan
- Driving criteria letter
- Casting lengths letter
- Splice letter

Contractor Arrives On Site

❑ **The contractor has arrived on site. There are a few preliminary items inspector is required to check, initially, that include:**

- Do they have an approved pile installation plan?
- Has the contractor met the requirements for protection of existing structures?
- Is a cofferdam required?

Equipment Set Up

- ❑ **The start of pile driving operations is getting close and the equipment has arrived on site. Just as when the contractor arrived on site, the inspector has a full plate of items he needs to verify and inspect for conformance.**
- ❑ **Check the following:**
  - — Does the equipment match the approved pile installation plan?
  - — Does the hammer match the approved pile installation plan?
  - — Has the contractor supplied certain items, by hammer type called for? Depending upon the type of hammer, the contractor is to provide certain things, like a Saximeter for open-end diesel hammers.
  - — Does the template provided and constructed match the approved pile installation plan?

Piles Arrive On Site

- ❑ **As the piles, concrete, or steel arrive on site, it is the responsibility of the inspector to examine them for evidence of damage and, if stored on site, verify they are stored properly.**
- ❑ **You need to ask these questions and review applicable specifications:**
  - — Is there a DOT stamp on the pile?
  - — Is the length/cross-section/size/prestress configuration correct for your job?
  - — For prestressed concrete piles:
    - ○ Are the lifting eyes removed and epoxied?
    - ○ Are there spalling/cracks, micro cracks or other damage visually apparent? Any damage noted should be reported to your supervisor for evaluation.
    - ○ Are prestress strands cut off below surface of concrete?
    - ○ Did you determine which end is driving head (chamfer)?
  - — For storage on job site:
    - ○ Is dunnage placed at correct lifting positions and is placed so that it won't settle?

Pile Driving

- ❑ **You have verified that the contractor's equipment matches what was submitted and approved in the pile installation plan, that they have complied with protection of existing structures requirements, and they are now getting ready to place the first pile in position.**
- ❑ **For the piles to be accepted, they should conform to the plans and specifications for the specific project in the State where the construction occurs.**
- ❑ **It is important that the pile be located in the proper plan position and be plumb or if battered, at the correct batter. Piles driven at the wrong locations, not plumb or at incorrect batters are a waste of everyone's time. Though not your responsibility, you need to verify that tolerances are adhered to.**
- ❑ **Tolerances:**
  - — It is imperative that the pile be located where it is supposed to be. If not, the remainder of the structure may not match up and that's not good. The plans provide the pile locations and the specifications provide the degree of accuracy the contractor must meet.
  - — How close is the pile to the planned location? The center of the pile is to be within 3 inches of the planned position.
- ❑ **Ensure that the final position of the pile head at cutoff elevation is no more than 3 inches [75 mm] from the plan position indicated in the plans.**
- ❑ **Ensure that the axial alignment of the driven piles does not deviate by more than 1/4 in/ft. [20 mm/m] from the vertical or batter line indicated in the plans.**
- ❑ **Ensure that the final elevation of the pile head is no more than 1.5 inches [38 mm] above, or more than 4 inches [100 mm] below, the elevation shown in the plans.**
- ❑ **Two types of holes: predrilled (not paid for) and preformed (paid for)**

- **Predrilled holes are either "starter holes", holes that have a maximum depth, in feet (set by each State's specifications), or holes drilled through an embankment or compacted fill. They are also used for getting through rock material that may damage the pile during driving.**
- **Preformed holes determined to be necessary by the designer or engineer to penetrate a strata that would prevent the driving or jetting of the piles to the desired penetration. Generally, preformed holes are identified in the project plans.**
- **Also check:**
  - Does the contractor plan on jetting?
  - Is he going to use external jets or center hole jets?
  - There are times when jetting isn't permitted. Jetting through an embankment is not permitted.
- **The inspector needs to set-up the Pile Driving Record Book and some information can be entered prior to driving.**
- **Helpful items for the Pile Driving Record Book include:**
  - The minimum tip target (MT)
    - If a Minimum Tip is specified, this is the elevation the tip of the pile must achieve before driving can be stopped, unless approved by the engineer.
    - This is an elevation that you can mark ahead of time. To have to constantly be calculating where the pile tip is in relation to Minimum Tip Elevation can be a hassle.
    - By making a mark ahead, the inspector has one less thing to worry about.
  - The stop for set-check (CO)
    - During the heat of battle, to have to constantly be calculating where cutoff is in relation to the amount of pile remaining can just be another thing to worry about.
    - Remember, the specification states we should stop driving if the pile is within 12 inches of the cutoff elevation and the required resistance has

not been achieved for a 15-minute set-check. This interruption in driving will allow us to perform a set-check to see if the pile gains capacity. By making a mark ahead, the inspector eliminates one more thing to worry about.

- ❑ **In some instances, the authorized pile length may not be long enough. In those instances, the contractor needs to splice on additional length.**
- ❑ **Once the type of splice is determined, check to ensure that the splice is properly performed.**
- ❑ **On the casted splice sections:**
  - — Check to ensure that the splice has the State DOT stamp from the inspector at the casting yard and not damaged during shipment.
  - — Check to ensure that the dowels are the proper length and that the proper number of dowels are present.
  - — Check to ensure the splice is the proper length. A minimum splice length of 10 ft. should be specified in the pile splice from the District Construction Office.
  - — Prior to splicing, ensure that the dowels and concrete are clean and dry. The epoxy will not properly bond if grease or water is present.
- ❑ **On cutoff pile section used as splice (prestressed concrete):**
  - — Check to ensure that the pile cutoff section has no visible cracks and that the pile head is square and clean.
  - — Check to ensure that the contractor drills the dowel hole in the proper location, on the correct end, and to the proper depth. Typically, these holes are 2 inches deeper than the dowels.
  - — Check to ensure that the dowels are properly placed and epoxied. Dowels should be clean and dry.
  - — The epoxy in the dowel holes of this section must be set before splicing onto the pile to be spliced.
- ❑ **On the pile to be spliced:**

- — Check to ensure that the pile has no visible cracks and that the pile head is square and clean.
- — Check to ensure that the contractor drills the dowel hole in the proper location, on the correct end, and to the proper depth. Typically, these holes are 2 inches deeper than the dowels.
- — A wood form is typically constructed around the pile to hold the epoxy.
- — Ensure that both the holes and the pile top are cleaned out, free of dust and dry.

❑ **Epoxy:**

- — Ask the contractor to provide copies of the epoxy manufacturer's specifications and mixing instructions and ensure they are followed. Pay particular attention to temperature and time restrictions.
- — Check to ensure that enough epoxy is placed in the holes. Epoxy should overflow the holes to fill the 1/2-inch gap between the pile and splice section after placement.
- — Check for expiration dates on the epoxy.

❑ **During splicing:**

- — Once the spliced section is in place, check to ensure the splice section is aligned with the in-place pile section and that it is not moved while the epoxy sets.
- — Set times should be stated in the manufacturer's instructions.
- — Once the set times for the epoxy have been met (check to ensure it is set) the pile may be driven.

❑ **For concrete splices:**

- — Spliced prestressed concrete piles are highly susceptible to damage from high tension stresses due to the lack of prestressing in the splice.
- — The inspector should pay particular attention to the splicing operation and the driving of the spliced pile. Alignment is probably the major cause of failure of spliced piles.

- — Incorrect use of the epoxy procedure is the second leading cause of splice failure. Also remember that spliced piles cannot withstand the same tension stresses as an unspliced pile.

❑ **For steel piles:**

- — Check to ensure that the piece being used for the splice is of the same grade and size steel as the pile being spliced.
- — Check to ensure that the splice length is the same as the lengths specified in splice letter provided to the District Construction Engineer. The contractor can choose to provide a longer splice, however, this is done at no cost to the State. Also, the District Geotechnical Engineer's office must be notified if a longer length is used so that the proper driving criteria can be provided.
- — Once the two sections are fully butt-welded together, the inspector should ensure that the two pieces are plumb and the weld is properly placed.
- — Ask:
  - Is the splice done as shown on the plans?
  - Is the welder qualified for this type of welding procedure?

When to Stop

❑ **Knowing when to stop driving is one of the most important responsibilities the inspector has.**

❑ **Depending upon the situation, this decision has numerous ramifications, such as extra contractor pay, damaging the pile, etc., so it is imperative the inspector knows and understands the when to stop driving and the pile acceptance decision process.**

❑ **Several points at which the inspector needs to make a decision to stop driving, include:**

- — If there is a specified minimum tip elevation, has the pile achieved it?
- — If no minimum tip elevation is specified, have you reached the minimum penetration requirements?
- — Has the specified driving criteria been achieved?
- — Has practical refusal been reached?

— Is the pile within 2 feet of the specified cutoff elevation?

- **The engineer may accept a driven pile when the pile has achieved minimum penetration, the blow count is generally increasing and the minimum required bearing capacity obtained for 24 inches [600 mm] of consecutive driving.**
- **At the engineer's discretion, a driven pile may be accepted when the minimum penetration is achieved and driving has reached practical refusal in firm material.**

Pay

- **To the contractor, this is the most important part of the inspector's paperwork and reporting.**
- **It is important the inspector be thoroughly knowledgeable of method of measurement and basis of payment, and maintain excellent records and documentation.**