Volume 5, Issue 6 November 22, 2021

STRUCTURE BULLETIN

NCDOT Construction Unit

Website email

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Current Issues:

Lifting Holes in Piles

Guidance on allowable lifting holes in piles has been updated. The Construction Manual is being updated as written below:

Contractors are allowed to place a hole in steel piles for safe lifting purposes. **Holes are not allowed to be used for supporting falsework** or for any other reasons unless approved by the Engineer. The size of the hole is limited to a one and one-half (1½) inch diameter if the hole is allowed to remain in place and must have an edge distance of at least one hole diameter. **If the hole is formed with a cutting torch, the portion of the pile above the bottom of the hole must be cut off and wasted**. Burned holes cannot remain in place or be repaired.

For **H-Piles**, with a drilled or punched hole, no repair is necessary other than touch up of any applicable coating in accordance with Article 1076-7.

For **Pipe Piles**, with a drilled or punched hole, the following criteria shall apply:

- If the location of the hole is within the limits of required galvanization or metallization as shown on the plans, the portion of the pile above the bottom of the hole must be cut off and wasted.
- As an exception, if the hole is completely encased in concrete from the footing or cap, the hole may remain, and the coating repaired in accordance with Article 1076-7.
- For Closed End Pipe Piles, the portion of the pile above the bottom of the hole must be cut off and wasted regardless of the location, unless fully encased in concrete.
- **Holes shall not be located on the spiral weld of the pipe pile.**

Pipe Pile Patches (No Longer Allowed):

In the past, some Contractors have welded a small patch over holes cut in pipe piles. Moving forward, in lieu of patching, the portion of the pile with the hole should be cut off in accordance with the guidance to the left, prior to welding the next section of pipe pile. The above picture also shows a hole that was cut over a spiral weld. Holes shall never be located on the spiral weld of the pipe pile.

For more information on H-Pile and Pipe Pile welding, always check your plans for applicable weld details and refer to M&T's website for Approved Structural Steel Welding Procedures. Contractors should also always use a rigid guide when cutting any type of structural steel.

Cold Weather Concrete:

As temperatures drop, modifications to concrete batching, placement, and curing become very important. Article 420-7 of the Standard Specs discusses requirements for placement of concrete in cold weather. Below is a summary of some of the requirements:

- If it's below 35° during the curing period, it must be protected. Use plenty of high low thermometers
- Protection Times - High Early (48 hrs); Straight Cement (72 hrs); Fly Ash or Slag (7 days)
- Protection Options

  - **Heated Enclosures**
    - Heat enclosure using stoves, salamanders, or steam equipment
    - Maintain 50°-90°
    - Prevent moisture loss
  - **Insulation**
    - See 420-7(C) for insulation requirements
    - Cover sides and bottoms of overhangs
    - If drops below 50° under insulation, immediately switch to heated enclosure.
    - When insulation is required, use a cold weather concrete mix (Table 1000-1 minimum cement content increased)
      - Type III Cement – No adjustment
      - Type I/II Cement– 677 lbs/cy
      - Fly Ash Mix – 572 lbs/cy cement, *143 lbs/cy fly ash (*spec says 172 but this is outdated and will be corrected)
      - Slag Mix – 465 lbs/cy cement, 250 lbs/cy slag

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If you have a topic you would like to see in a future edition of the Structure Bulletin, please email us at aearwood@ncdot.gov

Videos:

Inspection training videos can be found on the Construction Unit YouTube playlist.

Training: TBD

Structure Bulletins are now archived on the Construction Unit website under Construction Resources.

Freezing Weather:

We are quickly approaching the winter months and freezing temperatures have already begun in many places. Don't forget to protect your concrete when the temperatures drop. During extreme freezes, we need to ensure that there are no confined voids in structures that are holding water. In areas such as dowel holes, grout pots, and even CSL tubes, water can freeze, expand, and crack the concrete. Below is an example of an end bent which cracked when water in the anchor bolt void froze and expanded. Contractors should be sure to either blow out the water, add RV antifreeze, or fill the void with compressible material such as backer rod.