

FREQUENTLY ASKED QUESTIONS BY ENGINEERS AND CONTRACTORS REGARDING NON-REINFORCED CONCRETE PIPE

1. **Is this a new product?** No, prior to the 1920's, all the concrete pipe produced in the United States was non-reinforced. In fact, the oldest concrete sanitary sewer pipeline in the U.S. is non-reinforced pipe. This line was installed in 1842 in Mohawk, New York and is still in service today.
2. **How many State DOT's allow the use of non-reinforced concrete pipe?** Currently at least 30 States allow the use of non-reinforced concrete pipe under the traveled roadway, for side drains and in the median.
3. **Is the installation of non-reinforced concrete pipe any different than reinforced concrete pipe?** No, non-reinforced concrete pipe is handled and installed exactly like reinforced concrete pipe.
4. **Are the earth and live loads calculated differently when designing for non-reinforced concrete pipe?** No, the calculation of all loads, earth, live, surcharge, etc. are determined using the same methodology that is used for reinforced concrete pipe.
5. **What safety factors are used when designing NRCP?** Non-reinforced concrete pipe uses a test load safety factor of 1.5 for all designs unlike reinforced concrete pipe where the test load safety factor varies from 1.25 to 1.5.
6. **What is modulus of rupture?** It is defined as the ultimate tensile stress in the extreme fibers of the concrete based on triangular stress distribution with the neutral axis being in the center of the wall.
7. **What other types of non-reinforced pipe are there besides concrete?** Clay pipe, asbestos-cement pipe and cast-in-place concrete pipe are three examples of non-reinforced pipe.
8. **Are there specific ASTM/AASHTO standards relating to NRCP?** Yes, in fact the first ASTM concrete pipe standard approved, ASTM C 14, was for non-reinforced concrete pipe. Other ASTM standards for non-reinforced concrete pipe include ASTM C118, C412, C505 and C985.
9. **Do D-Load classifications apply to NRCP like they do for RCP?** Yes, D-Load classification refers to the strength of the pipe, non-reinforced or reinforced concrete pipe.

10. **Would a NRCP 3-EB test be applied the same as with RCP?** Yes, the 3-Edge-Bearing Test for strength determination is the same for both non-reinforced and reinforced concrete pipe.
11. **What are the maximum fill heights that can be used with NRCP?** As with reinforced concrete pipe, this would depend upon the diameter of the pipe being used, wall thickness, and the type of installation. As an example, for a 24" diameter 3" wall non-reinforced concrete pipe installed per AASHTO Type I installation, a maximum fill height of over 20' would be allowed.
12. **Does the 0.01" crack testing apply to NRCP?** No, non-reinforced concrete pipe is designed not to crack.
13. **Do contractors have trouble laying NRCP without breaking it?** No, non-reinforced concrete pipe has handling safety factors that range from 61 for 12" diameter to 9 for 36" diameter pipe. Breakage is not a problem.
14. **Why is this product just now available?** Non-reinforced concrete pipe has always been available. As stated previously over half of the State DOT's across the country have had a non-reinforced concrete pipe specification in their standards for years.
15. **Is NRCP interchangeable with RCP?** Yes, provided the strength class is maintained.
16. **Do the Standard Installation bedding factors apply to non-reinforced concrete pipe?** Yes, all aspects of the pipe design with regards to loads, installation, bedding factors, etc. are the same as for reinforced concrete pipe.