

# Mission Clay Products

A Division of MCP Industries

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On April 10<sup>th</sup>, 11<sup>th</sup> and 12<sup>th</sup>, Jeff Boschert and I performed testing on MCP's 36" & 24" NO-Dig joint at the Pittsburg, Kansas facility. Assistance was given by Wally Simmons and George Gadow. The following is a report on those results.

Subject: ASTM C1208 and infiltration testing @ 4.3 PSI

ASTM C1208 is the Standard Specification for VCP and Joints for use in Microtunneling. As presently written, ASTM C1208, 5.4 – Test Methods for Assembled Joints - 5.4.1, 5.4.2 and 5.4.3 state that a shear load of 50lbf/in be applied on the pipe and 4.3psi internal water pressure (equiv: to 10-ft head) for 1 hour with zero leakage.

Due to deep project design in our industry, NCPI Tech Services, along with Can Clay and Mission Clay, decided to do individual in-house testing of their microtunnel joint to assess whether a rewrite of ASTM C1208 and the 4.3 internal pressure (infiltration) as presently written, could/should be revised upwards to address the competition in our industry from other pipe materials. Hobas Pipe and Polycrrete Pipe presently publish 35psi internal pressure in their ASTM specifications respectively.

**Project:** Using a Mission Rubber MR013636 ARC coupling and 4 additional T-Bolt clamps for added exterior support, two pieces of 36" NO-DIG were assembled on the test rack in Pittsburg Kansas. The ARC coupling was positioned over the assembled joint and tightened. The coupling was pre-drilled and assembled with an air test gauge and water inlet hose to pressurize the interior space of the coupling and test for infiltration on the NO-DIG joint. ASTM C1208 calls for 50lbf/in or equivalent to 1800lbs shear load for 36" pipe. We applied 75lbf/in, 50% above ASTM C1208, approximately 2700lbs of shear load for this test.

**Results:** We initially took the test gauge utilizing the attached hose and water, to 10 psi external pressure, simulating infiltration, (equiv: to 23' head of water) for 30 minutes with zero leakage at/in the joint. We proceeded to 20 psi for 1/2 hour with zero leakage, then 25 psi pressure (equiv: to 58' head) for 1 hour and zero leakage.

At this time we decided to take off all load on the pipe and test our joint to as far as the coupling would take us. We pressurized the pipe joint to 36psi (equiv: to 84' head) and held that pressure for 3 hours with zero leakage at/in the NO-DIG joint. The coupling failed at 41psi (excessive leaking around the rubber seal). No leaking was observed at/in the joint of pipe.

**Project:** Using a Mission Rubber MR012424 ARC and 24" NO-DIG pipe, we assembled two pieces of 24" NO-DIG and repeated the procedure performed earlier on the 36" pipe. The main difference between the testing of these two sizes of pipe was that no load was applied to the 24" NO-DIG and we were unable to secure the extra (4) T-Bolt clamps to assist in the assembling of the joint. Regular worm drive clamps were used. As a consequence we were unable to hold pressure on the joint beyond 25psi (58' head) due to coupling leakage.

**Conclusion:** On testing of 36" NO-DIG pipe as per ASTM C1208, the results were very favorable. 36" pipe with a 36psi pressure gauge reading, no load applied and held for 3 hours with zero leakage. 36" pipe at 25psi with a shear load of 50% over ASTM C1208, 2700lbf/in, held for 1 hour and zero leakage. 24" NO-DIG testing was also positive. We held 25psi for 1 hour, no load, but due to coupling failure further testing advised.

**Considerations:** MCP Pittsburg attempted to rebuild a Test Cylinder purchased from Pacific Clay Products to conduct these tests. This Test Cylinder was used by P.C. for infiltration testing on their Dubai Microtunneling project many years ago. The correct sealing tube was not found in time to rebuild this test unit and use for our testing. MCP needs to consider whether or not to pursue the correct sealing tubes and retest our NO-DIG joint to failure in our effort to "quantify" the necessary data for a C1208 rewrite. Or, is the data resulting from the use of Mission Rubber ARC couplings sufficient to consider a rewrite of C1208.

\*\*There was a discussion that should we pursue further testing using Mission Rubber couplings vs. the test cylinder, a wider steel shield, cut and supplied by Mission Rubber, and more T-Bolt bands be utilized to insure a tight and proper seal around the exterior of the pipe.

NCPI Tech Services and ASTM are meeting the 2<sup>nd</sup> week of June. Let's get together before that time to discuss Mission's thoughts and position on this matter.

Thank you for your time and consideration,

Bryan Vansell  
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