



Florida Department of Transportation

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SECRETARY

May 26, 2010

Monica Gourdine
Program Operations Engineer
Federal Highway Administration
545 John Knox Road, Suite 200
Tallahassee, Florida 32303

Re: Office of Design, Specifications
Section 923
Proposed Specification: 9230000 Water For Concrete.

Dear Ms. Gourdine:

We are submitting, for your approval, two copies of the above referenced Supplemental Specification.

These changes were proposed by Susan Blazo of the State Materials Office to clarify requirements by aligning FDOT and DEP terms and definitions for different types of water and to add the requirement to use an accredited lab for water testing.

Please review and transmit your comments, if any, within two weeks. Comments should be sent via Email to ST986RP or rudy.powell@dot.state.fl.us.

If you have any questions relating to this specification change, please call Rudy Powell, State Specifications Engineer at 414-4280.

Sincerely,

Rudy Powell, Jr., P.E.
State Specifications Engineer

RP/cah
Attachment

cc: Gregory Jones, Chief Civil Litigation
Florida Transportation Builders' Assoc.
State Construction Engineer

WATER FOR CONCRETE.**(REV ~~3-24-10~~5-20-10)**

SECTION 923 (Pages 848 - 849) is deleted and the following substituted:

**SECTION 923
WATER FOR CONCRETE****923-1 General Requirements.**

Water for use with cement shall be clear and free from ~~injurious amounts of~~ oil, *and injurious amounts of* acid, alkali, chlorides, organic matter, and other deleterious substances. It shall not be salty or brackish. If it contains quantities of substances which discolor it or make it smell or taste unusual or objectionable or cause suspicion, it shall not be used unless ~~service records of concrete made with it indicates that it is not injurious to the quality of the concrete or approved by the Engineer~~ *Department. Water sources permitted include* ~~the~~ *potable water supplies that are approved by a public health department, open bodies of water, well water, reclaimed water, and recycled water. Reclaimed water shall be as defined in Chapter 62-610, F.A.C. Open bodies of water are defined as naturally occurring rivers, lakes, and ponds. Recycled water includes* ~~Wash~~ *wash* water from mixer washout operations, (stored in a lined settling pond). ~~→~~ *All other sources of and recycled wash water not listed above shall be considered recycled and reclaimed water. Recycled and reclaimed* may be used only to sprinkle the coarse aggregate stockpiles and for use in the batching of concrete meeting the requirements of Section 347. ~~Samples arriving at the laboratory shall be allowed 14 days for completion of tests. The frequency of testing, by the Department, of approved sources will be as outlined in the Sampling, Testing and Reporting Guide. At the discretion of the Engineer, the Department may require additional compliance testing at any time, of any water source.~~

923-2 Evaluation of Water for Concrete.

923-2.1 General: Water from ~~city~~ *potable* water supplies that are approved by a public health department ~~may- be~~ *may be accepted* ~~used~~ without *additional* testing. ~~Wash water from mixer washout and recycled wash water shall meet the requirements of 923-3.2. and 923-4. All other sources of water shall meet the requirements 923-3.3 and 923-4. The concrete producer shall provide test data of water samples~~ *from other sources. To determine chemical properties, use a laboratory accredited by the National Environmental Laboratory or Construction Materials Engineering Council Accreditation Program. To determine physical properties, use a laboratory accredited by the Construction Materials Engineering Council Accreditation Program or Cement and Concrete Reference Laboratory.*

923-2.2 Source ~~Initial Sampling and Testing Frequency: Approval:~~ *Open bodies of water and well water shall be initially sampled once prior to use. Wash* ~~Recycled and reclaimed water from mixer washout operations and recycled wash water shall be tested once per week for four weeks initially, and thereafter once per month for four months prior to its use, provided that the results of the test samples~~

comply with all the applicable limits. ~~All other sources shall test one sample initially.~~ *Failing test results will result in restarting initial sampling and testing.*

923-2.3 Source Sampling *Production Sampling and Testing Frequency*: Open bodies of water and recycled water shall be tested monthly. Well *water and reclaimed water shall* ~~and other sources of water will~~ be tested once every three months. If the last eight consecutive well water *and reclaimed water* samples meet the requirements, then the sample frequency may be reduced to one sample every six months, as approved by the ~~Engineer~~ *Department*. If a well water ~~sample~~ *or reclaimed water sample* fails once the frequency has been ~~changed~~ *reduced*, then the sampling frequency shall revert back to once every three months.

923-3 Chemical Requirements.

923-3.1 Testing: All chemical analysis or tests shall be performed in accordance with ~~the AASHTO T 26 Test Methods~~ *listed in Tables 1 and 2* or Standard Methods for the Examination of Water and Wastewater.

923-3.2 Reclaimed *Recycled and Reclaimed Water*: *Recycled and reclaimed Water* ~~water~~ from mixer washout and recycled wash water shall be tested ~~and approved~~ before use and shall not exceed the following allowable limits *in Table 1*:

Chemical Test	<i>Test Method</i>	Maximum (%)
Equivalent Alkalis as (Na ₂ O + 0.658 K ₂ O)	<i>ASTM D 6919</i>	0.06
Total Solids	<i>AASHTO T 26</i>	5.00
Total Chlorides as Sodium Chloride <i>Cl</i>	<i>ASTM D 512</i>	0.05 <i>0.031</i>
<i>Total Sulfates</i> as SO ₄ ²⁻	<i>ASTM D 516</i>	0.30

923-3.3 All *Open Bodies of Water and Well Water* ~~Other Sources~~: *Open bodies of water and well water* from all sources, other than public health approved sources, shall be tested ~~and approved~~ before use and shall not exceed the following allowable limits *of Table 2*:

Chemical Test	<i>Test Method</i>	Maximum (%)
Acidity or A <i>alkalinity</i> C <i>calculated</i> in terms of C <i>calcium</i> C <i>carbonate</i>	<i>AASHTO T 26</i>	0.05
Total O <i>organic</i> S <i>solids</i>	<i>AASHTO T 26</i>	0.05
Total I <i>inorganic</i> S <i>solids</i>	<i>AASHTO T 26</i>	0.08
Total C <i>chlorides</i> as Cl <i>sodium chloride</i>	<i>ASTM D 512</i>	0.05 <i>0.031</i>
<i>Total Sulfates</i> as SO ₄ ²⁻	<i>ASTM D 516</i>	<i>0.30</i>

923-4 Physical Requirements for Mortar.

Mortar shall be tested in accordance with ~~AASHTO T 106~~ *ASTM C 109* with the following exception: the mortar shall not be tested for flow. The mortar, composed of the sampled water, shall have a compressive strength of not less than 90% when compared to a mortar prepared using distilled water and tested at seven days.

Water of a questionable quality, as determined by the ~~Engineer~~*Department*, shall be subject to the acceptance criteria for time of set as required by ~~AASHTO M-157~~*ASTM C 1602*, Table 1.

WATER FOR CONCRETE.**(REV 5-20-10)**

SECTION 923 (Pages 848 - 849) is deleted and the following substituted:

**SECTION 923
WATER FOR CONCRETE****923-1 General Requirements.**

Water for use with cement shall be clear and free from oil, and injurious amounts of acid, alkali, chlorides, organic matter, and other deleterious substances. It shall not be salty or brackish. If it contains quantities of substances which discolor it or make it smell or taste unusual or objectionable or cause suspicion, it shall not be used unless approved by the Department. Water sources permitted include potable water supplies that are approved by a public health department, open bodies of water, well water, reclaimed water, and recycled water. Reclaimed water shall be as defined in Chapter 62-610, F.A.C. Open bodies of water are defined as naturally occurring rivers, lakes, and ponds. Recycled water includes wash water from mixer washout operations (stored in a lined settling pond). All other sources of water not listed above shall be considered recycled and reclaimed water. Recycled and reclaimed may be used only to sprinkle the coarse aggregate stockpiles and for batching concrete meeting the requirements of Section 347.

923-2 Evaluation of Water for Concrete.

923-2.1 General: Water from potable water supplies approved by a public health department may be used without additional testing. The concrete producer shall provide test data of water samples from other sources. To determine chemical properties, use a laboratory accredited by the National Environmental Laboratory or Construction Materials Engineering Council Accreditation Program. To determine physical properties, use a laboratory accredited by the Construction Materials Engineering Council Accreditation Program or Cement and Concrete Reference Laboratory.

923-2.2 Initial Sampling and Testing Frequency: Open bodies of water and well water shall be initially sampled once prior to use. Recycled and reclaimed water shall be tested once per week for four weeks initially, and thereafter once per month for four months prior to its use, provided that the results of the test samples comply with all the applicable limits. Failing test results will result in restarting initial sampling and testing.

923-2.3 Production Sampling and Testing Frequency: Open bodies of water and recycled water shall be tested monthly. Well water and reclaimed water shall be tested once every three months. If the last eight consecutive well water and reclaimed water samples meet the requirements, then the sample frequency may be reduced to one sample every six months, as approved by the Department. If a well water or reclaimed water sample fails once the frequency has been reduced, then the sampling frequency shall revert back to once every three months.

923-3 Chemical Requirements.

923-3.1 Testing: All chemical analysis or tests shall be performed in accordance with the test methods listed in Tables 1 and 2 or Standard Methods for the Examination of Water and Wastewater.

923-3.2 Recycled and Reclaimed Water: Recycled and reclaimed water shall be tested before use and shall not exceed the limits in Table 1:

Table 1		
Chemical Test	Test Method	Maximum (%)
Equivalent Alkalies as (Na ₂ O + 0.658 K ₂ O)	ASTM D 6919	0.06
Total Solids	AASHTO T 26	5.00
Total Chlorides as Cl ⁻	ASTM D 512	0.031
Total Sulfates as SO ₄	ASTM D 516	0.30

923-3.3 Open Bodies of Water and Well Water: Open bodies of water and well water shall be tested before use and shall not exceed the limits of Table 2:

Table 2		
Chemical Test	Test Method	Maximum (%)
Acidity or Alkalinity Calculated in terms of Calcium Carbonate	AASHTO T 26	0.05
Total Organic Solids	AASHTO T 26	0.05
Total Inorganic Solids	AASHTO T 26	0.08
Total Chlorides as Cl ⁻	ASTM D 512	0.031
Total Sulfates as SO ₄	ASTM D 516	0.30

923-4 Physical Requirements for Mortar.

Mortar shall be tested in accordance with ASTM C 109 with the following exception: the mortar shall not be tested for flow. The mortar, composed of the sampled water, shall have a compressive strength of not less than 90% when compared to a mortar prepared using distilled water and tested at seven days.

Water of a questionable quality, as determined by the Department, shall be subject to the acceptance criteria for time of set as required by ASTM C 1602, Table 1.