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| REVIEW OF NEW SPECIFICATION OR SPECIFICATION CHANGE  | **Log No.**  203-6 2nd review |
| **Specification Section No.:** 203 | **Item:** Imported Material for Embankment |
| **Originating Office:** Pipe Materials Task Group | **By:** Rees |
| **Date Sent For Review:** January 11, 2011 | **Date Comments Due: January 26, 2011** |
| Please submit response to: STANDARDS AND SPECIFICATIONS UNIT, ROOM 290, HEADQUARTERS, DENVER |
| **Reviewer** | **Concurrent Reviews – Others Commenting** | The attached Draft Specification is submitted for your review and comments. If not returned by Date Comments Due, the draft specification will be considered to be approved unless the Specification Unit of Staff Design [(303) 757-9474, (303) 757-9402] is advised otherwise.**REMARKS:** Modifications to the original proposals are shown in the attached. The key changes to the previous version involve when pH, sulfate, resistivity, chloride, and combinations thereof should be tested.If these modifications are approved, our unit will issue these in a new standard special provision.  |
|  | **Spec Committee Members:** |  |
|  | Chairman: Wassenaar | X |
|  | Region 1: Cox | **X** |
|  | Region 2: Burch | **X** |
|  | Region 3: Alexander | **X** |
|  | Region 4: Frieler | **X** |
|  | Region 5: Beller | **X** |
|  | Region 6: Koenig | **X** |
|  | Project Development: Lacey | **X** |
|  | Specifications: Brinck | **X** |
|  | Bridge: Hasan | **X** |
|  | Agreements: Eddy | **X** |
|  | Materials: Zufall | **X** |
|  | Traffic Engineering: Matthews | **X** | REVIEWER COMMENTS:( ) Approved ( ) Disapproved ( ) ModifiedIf disapproved or modified, give reason why and show any modifications on the attached draft copy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ Name/Signature Date |
|  | Maintenance: Mueller | **X** |
|  | FHWA: Harmelink | **X** |
|  | Attorney General:  | **X** |
|  | Attorney General: Morrow | **X** |
|  |  |  |
|  | **Others:** |  |
|  | Colorado Contractors Assoc.: Moody | **X** |
|  |  |  |
|  | **Technical Committees:** |  |
|  | Bridge |  |
|  | Culvert |  |
|  | Joint Co-op, CCA/CDOT |  |

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| **COLORADO DEPARTMENT OF TRANSPORTATION****SUBMITTAL OF NEW SPECIFICATION OR SPECIFICATION CHANGE** | Log No. (Assigned by Standards and Specifications Unit)203-6 2nd Review |
| TO: Standards and Specifications Unit, Project Development, Suite 290 | FROM:PIpe Materials Task Group(Region, Branch or Technical Committee) |
| SPECIFICATION SECTION NO.203 | ITEMBackfill for Pipes | Priority Routine[x]  Fast[ ]  |
| Reason for this new or changed specification:To ensure that pipes are backfilled with a material (import) that is compatible with the CR level specified in the contract.  |
| New or Revised Specification:See Attached. |
| Note: See Procedural Directive 513.1 for a description of appropriate specification development procedures. |

 **CDOT Form 1215 10/01**

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REVISION OF SECTION 203

IMPORTED MATERIAL FOR EMBANKMENT

Section 203 of the Standard Specifications is hereby revised for this project as follows:

Subsection 203.03 (a) shall include the following:

Imported Material used for backfilling pipes (storm sewer, cross culverts, side drains, etc) shall be tested for compatibility with the selected pipe material.

When Nonreinforced Reinforced Concrete Pipe or Reinforced Concrete Pipe is used, the imported material shall be tested for sulfate & pH

When Corrugated Steel Pipe, Bituminous Coated Corrugated Steel Pipe or Precoated Corrugated Steel Pipe is used, the imported material shall be tested for sulfates, chlorides, pH and resistivity.

When Aramid Fiber Bonded Corrugated Steel Pipe or Corrugated Aluminum Pipe is used, the imported material shall be tested for pH and resistivity.

When Plastic pipe is selected, the imported fill does not need to be tested for sulfates, chlorides, pH and resistivity.

sulfates, chlorides, pH and resistivity shall be determined by the following procedures:

1. Water soluble sulfates using CP-L 2103 Method B.
2. Chlorides using CPL 2104
3. Resistivity using ASTM G57
4. pH using ASTM G51.

The average of three consecutive tests shall show the imported material’s sulfate, chloride, pH and resistivity is not greater than the limits corresponding to the Pipe Class in Table 203-1 or 203-2 for the pipe class specified on the plans. No single test shall have a result more than 20 percent greater than that corresponding to the limit in Table 203-1 or Table 203-2 for sulfates, chlorides and resistivity. No single test shall have a result more than 5 percent outside the limit in Table 203-1 for pH. The remaining sample material from a single failing test shall be split into three equal portions. CDOT shall receive one portion, the Contractor shall receive one portion and the remaining portion shall be retained by the Project. CDOT and the Contractor’s Lab shall retest the failed sample; if the results from the those tests are within 10 percent of each other, the results will be averaged. The averaged result will be used for Contract compliance. If the results from the Labs are not within 10 percent of each other, the remaining sample portion will be sent to an independent laboratory for testing using the testing requirements specified above. The independent laboratory will be mutually agreed upon by the Department and the Contractor. The Independent Lab’s test result will be used for Contract compliance.

If the imported material’s sulfates, chlorides, and resistivity are less than the limits and the pH is within the limits in Table 203-1 or 203-2, CDOT will bear all costs associated with the independent lab test. If the imported material’s sulfates, chlorides, and resistivity is greater than the limits and the pH is outside the limits in Table 203-1 or 203-2,, all costs associated with independent lab testing shall be at the Contractor’s expense.

Embankment represented by failing tests shall be removed from the project and replaced at the Contractor’s expense.

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REVISION OF SECTION 203

IMPORTED MATERIAL FOR EMBANKMENT

**Table 203-1**

**SULFATE, CHLORIDE AND PH OF IMPORTED MATERIAL**

|  |  |
| --- | --- |
|  | **SOIL** |
| Pipe Class | Sulfate | Chloride |  |
| (SO4) | (Cl) | pH |
| % max | % max |  |
| 0 , 7 | 0.05 | 0.05 | 6.0-8.5 |
| 1, 7 | 0.10 | 0.10 | 6.0-8.5 |
| 2, 8 | 0.20 | 0.20 | 6.0-8.5 |
| 3, 9 | 0.50 | 0.50 | 6.0-8.5 |
| 4, 9 | 1.00 | 1.00 | 5.0-9.0 |
| 5, 10 | 2.00 | 2.00 | 5.0-9.0 |
| 6, 10 | >2.00 | >2.00 | <5 or >9 |

**Table 203-2**

**RESISTIVITY AND PH OF IMPORTED MATERIAL**

|  |
| --- |
| **SOIL SIDE** |
| Resistivity, R (Ohm – cm) |  |
| pH |
|  |
| ≥1,500 | 5.0-9.0 |
| ≥250 | 3.0-12.0 |