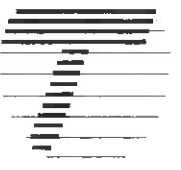
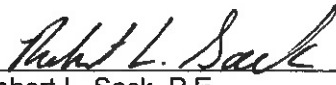


To: SUPERSEDED BY EI 12-014 EFFECTIVE 9/6/12		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 08-034
Title: SECTION 204 - CONTROLLED LOW STRENGTH MATERIAL (CLSM)			
Distribution: ☐ Manufacturers (18) ☐ Surveyors (33) ☒ Local Govt. (31) ☒ Consultants (34) ☒ Regional/Agencies (32) ☒ Contractors (39) ☐ _____ ()		Approved:  Robert L. Sack, P.E. Deputy Chief Engineer (Research) 24 SEP 08 Date	

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of May 7, 2009.
- Modified issuance(s): This EI modifies EI 02-005.
- Disposition of issued materials: The information transmitted by this issuance will reside in the Standard Specifications.

PURPOSE: The purpose of this EI is to issue revised Standard Specification Section 204.

TECHNICAL INFORMATION:

- Section 204 in the Standard Specifications is deleted and replaced with the revised Section 204 transmitted by this issuance.
- The Standard Specification Section 733 *Earthwork Materials* is being issued concurrently via EI 08-035.
- The Construction Inspection Manual (CIM) Section 204 *Controlled Low Strength Material (CLSM)* will be issued separately at a later date.
- Guidelines for the use of Controlled Low Strength Material are contained in Chapter 9 of the Highway Design Manual. Standard Details for the installation of Controlled Low Strength Material are contained in Standard Sheet M204-1.
- The revisions to the Standard Specification include the following:
 1. Material requirements were moved to §733-01 *Controlled Low Strength Material (CLSM)*.
 2. Disallowed placement of CLSM that is frozen, placement of CLSM on frozen ground or exposing CLSM to freezing temperatures until after it has gained its requisite strength.

IMPLEMENTATION:

- The Main Office Design Quality Assurance Bureau will insert these standard specification shelf notes beginning with projects submitted for the letting of May 7, 2009.

TRANSMITTED MATERIALS:

- Standard Specification Section 204 *Controlled Low Strength Material (CLSM)* shelf notes. Both metric and U.S. Customary shelf notes are attached.

BACKGROUND:

- To achieve the Department's goal of completing construction projects in a timely manner, it is essential to use products which decrease installation time and effort over conventional materials. CLSM is used primarily as a self-leveling backfill material and does not require compaction. It is much lower in strength than concrete, making future excavation possible. Due to the self-compacting properties of the

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material, construction personnel and equipment are not required in confined spaces for compaction operations. As a result, the width of excavations can be decreased, laid back slopes eliminated and flagging operations reduced. Guidelines for laid back slopes as opposed to the use of support systems in relation to the excavation items were originally issued by EI 98-032 & EI 98-033 and moved to the Bridge Manual via EI 05-010.

- The Department is implementing Trns·port SiteManager, including both Construction and Materials functionality. Implementation of standard AASHTO software enables SiteManager to allow revising this agency's practices to be more consistent with industry-accepted best practices. The revisions to the Standard Specifications are to conform to SiteManager's methodology in defining its Material Codes and Pay Items.

CONTACT: Questions or comments regarding this issuance should be directed to Randall J. Romer, P.E., of the Geotechnical Engineering Bureau at (518) 457-4714, rromer@dot.state.ny.us. Questions or comments regarding the technical aspects of the Standard Specification Section should be directed to Don Dwyer, P.E., of the Geotechnical Engineering Bureau at (518) 457-4724, ddwyer@dot.state.ny.us.

CONTROLLED LOW STRENGTH MATERIAL

Make the following changes to the Standard Specifications dated May 4, 2006:

Delete Section 204- Controlled Low Strength Material entirely and **Add** the following:

SECTION 204 - CONTROLLED LOW STRENGTH MATERIAL (CLSM)

204-1 DESCRIPTION. The work shall consist of mixing and placing Controlled Low Strength Material (CLSM) or Controlled Low Strength Material (CLSM) (No Fly Ash) at the locations shown in the contract documents.

204-2 MATERIALS.

204-2.01 Controlled Low Strength Material Requirements. Provide backfill material meeting the requirements of §733-01 *Controlled Low Strength Material (CLSM)*.

204-3 CONSTRUCTION DETAILS.

204-3.01 Submit certification of a mix design for CLSM meeting the unconfined compressive strength requirements to the Engineer.

Mix the materials at a stationary mixing plant which is either a continuous or a batch type plant. A batch is defined as the amount of material that can be mixed at one time. Design the mix of materials to accurate proportions, either by volume or by weight, so that when the materials are incorporated in the mix a thorough and uniform mix will result.

If the CLSM can be placed within 30 minutes of the end of mixing, then open haul units may be used for transport. If it cannot be placed within 30 minutes after the end of mixing, it must be transported by a rotating drum unit capable of 2-6 rpm.

For work involving quantities of CLSM less than 2.0 m³, the Contractor may use a small portable mixer. Provide a mixer capable of mixing CLSM that has the specified unconfined compressive strength and flow consistency. Mix all components so as to produce a uniform product.

Narrower trench widths can be employed when using CLSM due to the self-compacting properties of the material. Construction personnel and equipment are not required to be in the trench for compaction operations. For installations that require that construction personnel temporarily occupy the trench, follow OSHA safety requirements for worker safety.

Do not place CLSM that is frozen, or place CLSM on frozen ground. Do not expose CLSM to freezing temperatures until after it has gained its requisite strength, abiding by Cold Weather Curing regulations.

If the CLSM is to be placed via pumps, the placement sequence shall be such that the equipment is able to access the entire volume to be filled without separating the mixture.

Include in the CLSM placement sequence, a procedure to account for subsidence during the settling and curing process.

204-3.02 Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables. Place the CLSM in accordance with the installation details shown on the Standard Sheet.

When placing CLSM for pipe backfill, discharge the material onto the top and at the center of the pipe.

Do not place CLSM in contact with aluminum pipe, including connections, fixtures, etc., unless the aluminum has been thoroughly coated with Zinc Chromate Primer, §708-04 *Zinc Chromate Primer* or an equivalent alternative as approved by the Materials Bureau.

Do not place CLSM containing fly ash in direct contact with cast iron or ductile iron pipes, fittings or appurtenances.

CONTROLLED LOW STRENGTH MATERIAL

Keep CLSM encapsulated with soil, as it is highly erodible and disintegrates when left exposed to the environment

In situations where CLSM is used as backfill around lightweight pipe, take precautions to counteract the pipe's buoyancy.

204-4 METHOD OF MEASUREMENT. CLSM will be measured for payment in cubic meters measured to the nearest 0.1 cubic meter computed from the payment lines shown on the contract documents.

A deduction will be made for pipes (based on nominal diameters) and other features when the combined cross-sectional area exceeds 0.1 m².

No additional quantity shall be measured for payment to make up losses due to foundation settlement, compaction, erosion or any other cause.

Cross sectioning, for the purpose of determining quantities for payment, will be employed only where payment lines are not shown on the contract documents or Standard Sheets, and cannot be reasonably established by the Engineer.

204-5 BASIS OF PAYMENT.

204-5.01 General. The unit price bid shall include the costs of furnishing all labor, material, and equipment necessary to satisfactorily complete the work, including work needed to counteract buoyancy.

Payment will be made under:

Item No.	Item	Pay Unit
204.01	Controlled Low Strength Material (CLSM)	Cubic Meter
204.02	Controlled Low Strength Material (CLSM) (No Fly Ash)	Cubic Meter

CONTROLLED LOW STRENGTH MATERIAL

Make the following changes to the Standard Specifications dated May 1, 2008:

Delete Section 204- Controlled Low Strength Material entirely and **Add** the following:

SECTION 204 - CONTROLLED LOW STRENGTH MATERIAL (CLSM)

204-1 DESCRIPTION. The work shall consist of mixing and placing Controlled Low Strength Material (CLSM) or Controlled Low Strength Material (CLSM) (No Fly Ash) at the locations shown in the contract documents.

204-2 MATERIALS.

204-2.01 Controlled Low Strength Material Requirements. Provide backfill material meeting the requirements of §733-01 *Controlled Low Strength Material (CLSM)*.

204-3 CONSTRUCTION DETAILS.

204-3.01 Submit certification of a mix design for CLSM meeting the unconfined compressive strength requirements to the Engineer.

Mix the materials at a stationary mixing plant which is either a continuous or a batch type plant. A batch is defined as the amount of material that can be mixed at one time. Design the mix of materials to accurate proportions, either by volume or by weight, so that when the materials are incorporated in the mix a thorough and uniform mix will result.

If the CLSM can be placed within 30 minutes of the end of mixing, then open haul units may be used for transport. If it cannot be placed within 30 minutes after the end of mixing, it must be transported by a rotating drum unit capable of 2-6 rpm.

For work involving quantities of CLSM less than 2 ½ yd³, the Contractor may use a small portable mixer. Provide a mixer capable of mixing CLSM that has the specified unconfined compressive strength and flow consistency. Mix all components so as to produce a uniform product.

Narrower trench widths can be employed when using CLSM due to the self-compacting properties of the material. Construction personnel and equipment are not required to be in the trench for compaction operations. For installations that require that construction personnel temporarily occupy the trench, follow OSHA safety requirements for worker safety.

Do not place CLSM that is frozen, or place CLSM on frozen ground. Do not expose CLSM to freezing temperatures until after it has gained its requisite strength, abiding by Cold Weather Curing regulations.

If the CLSM is to be placed via pumps, the placement sequence shall be such that the equipment is able to access the entire volume to be filled without separating the mixture.

Include in the CLSM placement sequence, a procedure to account for subsidence during the settling and curing process.

204-3.02 Fill and Backfill at Structures, Culverts, Pipes, Conduits and Direct Burial Cables. Place the CLSM in accordance with the installation details shown on the Standard Sheet.

When placing CLSM for pipe backfill, discharge the material onto the top and at the center of the pipe.

Do not place CLSM in contact with aluminum pipe, including connections, fixtures, etc., unless the aluminum has been thoroughly coated with Zinc Chromate Primer, §708-04 *Zinc Chromate Primer* or an equivalent alternative as approved by the Materials Bureau.

Do not place CLSM containing fly ash in direct contact with cast iron or ductile iron pipes, fittings or appurtenances.

CONTROLLED LOW STRENGTH MATERIAL

Keep CLSM encapsulated with soil, as it is highly erodible and disintegrates when left exposed to the environment

In situations where CLSM is used as backfill around lightweight pipe, take precautions to counteract the pipe's buoyancy.

204-4 METHOD OF MEASUREMENT. CLSM will be measured for payment in cubic yards measured to the nearest 0.1 cubic yard computed from the payment lines shown on the contract documents.

A deduction will be made for pipes (based on nominal diameters) and other features when the combined cross-sectional area exceeds 1 ft².

No additional quantity shall be measured for payment to make up losses due to foundation settlement, compaction, erosion or any other cause.

Cross sectioning, for the purpose of determining quantities for payment, will be employed only where payment lines are not shown on the contract documents or Standard Sheets, and cannot be reasonably established by the Engineer.

204-5 BASIS OF PAYMENT.

204-5.01 General. The unit price bid shall include the costs of furnishing all labor, material, and equipment necessary to satisfactorily complete the work, including work needed to counteract buoyancy.

Payment will be made under:

Item No.	Item	Pay Unit
204.01	Controlled Low Strength Material (CLSM)	Cubic Yard
204.02	Controlled Low Strength Material (CLSM) (No Fly Ash)	Cubic Yard