

SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 14-009								
Title: STANDARD SPECIFICATION §733-16 WINTER EARTHWORK											
Target Audience: <table border="0"> <tr> <td>☐ Manufacturers (18)</td> <td>☐ Surveyors (33)</td> </tr> <tr> <td>☒ Local Govt. (31)</td> <td>☒ Consultants (34)</td> </tr> <tr> <td>☒ Agencies (32)</td> <td>☒ Contractors (39)</td> </tr> <tr> <td></td> <td>☐ _____ ()</td> </tr> </table>		☐ Manufacturers (18)	☐ Surveyors (33)	☒ Local Govt. (31)	☒ Consultants (34)	☒ Agencies (32)	☒ Contractors (39)		☐ _____ ()	Approved: _____ Robert L. Sack, P.E. Deputy Chief Engineer (Research) 8 July 14 Date	
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ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of January 8, 2015.
- This EI modifies a portion of EI 09-027
- The revisions issued with this EI will be incorporated into the next update of the Standard Specifications.

PURPOSE: The purpose of this EI is to issue revised Standard Specification §733-16 *Winter Earthwork*.

TECHNICAL INFORMATION:

- §733-16 in the Standard Specifications is deleted and replaced with the revised §733-16 transmitted by this issuance.
- A revision to Geotechnical Engineering Manual (GEM-12) *Guidelines for Embankment Construction* is being issued concurrently via EB 14-024.
- A revised Standard Specification Section 203 is being issued concurrently via EI 14-010.
- A revised Standard Specification Section 304 is being issued concurrently via EI 14-011.
- A revised Standard Specification Section 554 is being issued concurrently via EI 14-012.
- The revisions to the Standard Specification §733-16 include the following:
 1. Added Material Code 733.1608 *Winter Earthwork Material for MSES Backfill* to the Scope Section.
 2. Added stockpile procedures in the Material Requirements Section.
 3. Added Winter Earthwork Material for MSES Backfill to the Material Requirements Section.
 4. Added stockpile procedures in the Basis of Approval.
 5. Added stockpile procedures in the Basis of Acceptance.

IMPLEMENTATION:

- The Main Office Design Quality Assurance Bureau will insert these standard specification revisions into contract proposals beginning with projects submitted for the letting of January 8, 2015.

TRANSMITTED MATERIALS: Revisions to Standard Specification §733-16 *Winter Earthwork*. Both metric and US Customary revisions are attached.

BACKGROUND: Compaction of soil during cold weather is difficult and can be impractical. Water acts as a lubricant aiding in the process of compaction. As the temperature decreases, the water becomes more viscous (less slippery) and inhibits efforts to pack the soil particles together. Eventually, the water becomes ice, at which point compaction is impossible.

Earthwork construction operations requiring compaction shall not be performed from November 1st thru April 1st except with a Winter Earthwork submittal. A Winter Earthwork submittal shall outline the modifications to materials and/or methods including the following:

1. Material Requirements. The material shall meet the requirements of §733-16 *Winter Earthwork*.

2. Material Placement. The proposed methods will control the weather effects on the material and existing ground conditions (i.e. insulation, enclosures, canvas and framework). The methods will include a plan such that all snow, ice, and frozen material is to be removed from the surface of the ground on which embankment or backfill material is to be placed, and from the surface under construction before succeeding lifts are added.

3. Procedures. Procedures will be used to verify that the existing ground is not frozen to any depth (e.g. test pits) and to address freeze-thaw action in earthwork that has remained idle during temperature fluctuations (e.g. re-roll and seal the surface prior to placement of succeeding lift).

4. Seasonal Adjustment Acceptance. Acknowledgement of a transition period is provided to allow the continued use of standard earthwork materials between November 1st and April 1st only under conditions where the air temperature, ground temperature and material temperature are all above 32° F at the time of placement. Also acknowledged are the winter earthwork restrictions stating that, if the air temperature, ground temperature, or material temperature is at or below 32° F, earthwork will only proceed using material that meets the requirements of §733-16 *Winter Earthwork* and/or standard earthwork material placement utilizing the modified methods and procedures contained in the approved Winter Earthwork Submittal.

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, or via e-mail at rromer@dot.state.ny.us. Questions or comments regarding the technical aspects of the revision to the Standard Specification should be directed to Don Dwyer, P.E., of the Geotechnical Engineering Bureau at (518) 457-4724, ddwyer@dot.state.ny.us.

§733-16 WINTER EARTHWORK

Make the following changes to the Standard Specifications dated May 1, 2008 as modified by EI 09-027:

Delete entirely §733-16 and **Replace** it with the following:

§733-16 WINTER EARTHWORK

SCOPE. This specification addresses the material requirements and methods of assessing earthwork materials placed during construction operations between November 1st and April 1st. The following materials are evaluated in this specification:

- 733.1601 – Winter Earthwork Material for Embankment In Place
- 733.1602 – Winter Earthwork Material for Select Borrow
- 733.1603 – Winter Earthwork Material for Select Fill
- 733.160401 – Winter Earthwork Material for Select Granular Fill (Typical)
- 733.160402 – Winter Earthwork Material for Select Granular Fill for Corrugated Aluminum Pipe
- 733.160501 – Winter Earthwork Material for Select Granular Subgrade (Blasted Rock)
- 733.160502 – Winter Earthwork Material for Select Granular Subgrade (Typical)
- 733.160503 – Winter Earthwork Material for Select Granular Subgrade (RCA)
- 733.160504 – Winter Earthwork Material for Select Granular Subgrade (RCA Mixture)
- 733.1606 – Winter Earthwork Material for Select Structural Fill
- 733.1607 – Winter Earthwork Material for GRSS Slope Backfill
- 733.1608 – Winter Earthwork Material for MSES Backfill

SAMPLING. Perform material tests and quality assurance methods pertaining to the backfill requirements in conformance with the procedures contained in the geotechnical control procedure “*Procedure for the Control and Quality Assurance of Granular Materials*”.

MATERIAL REQUIREMENTS.

A. SUPPLY

1. Source Material. Provide unfrozen backfill material from an approved source in accordance with the geotechnical control procedure “*Procedure for the Control and Quality Assurance of Granular Materials*”.

2. Stockpiled Material. Stockpile the backfill material in accordance with the geotechnical control procedure “*Procedure for the Control and Quality Assurance of Granular Materials*”.

B. GRADATION.

1. Winter Earthwork Material for Embankment In Place. Provide material consisting of rock, stone, slag, cobbles, or gravel, substantially free of shale or other soft, poor durability particles. The material shall have no particles greater than 12 in. in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material.

§733-16 WINTER EARTHWORK

TABLE 733-16A GRADATION OF WINTER EARTHWORK MATERIAL	
Sieve Size Designation	Percentage Passing by Weight
Maximum Dimension	100
½ of Maximum Dimension	0-50
¼ in.	0-10
No. 200	0-4

The gradation is evaluated at the project level.

2. Winter Earthwork Material for Select Borrow. Provide material meeting the requirements of §733-09 *Select Borrow* with the following gradation adjustment:

The material shall have no particles greater than 3 ft. in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material. The gradation is evaluated at the project level.

3. Winter Earthwork Material for Select Fill. The material requirements contained in §733-16 B.2. *Winter Earthwork Material for Select Borrow* shall apply.

4. Winter Earthwork Material for Select Granular Fill. Provide material meeting the requirements of §733-11 *Select Granular Fill* with the following gradation adjustment:

The material shall have no particles greater than 4 in. in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material. The gradation is evaluated at the project level.

5. Winter Earthwork Material for Select Granular Subgrade. Provide material meeting the requirements of §733-13 *Select Granular Subgrade* with the following material and gradation adjustment:

The material shall have no particles greater than 6 in. in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material. RAP shall not be used. The gradation is evaluated at the project level.

6. Winter Earthwork Material for Select Structure Fill. The material requirements contained in §733-16 B.4. *Winter Earthwork Material for Select Granular Fill* shall apply.

7. Winter Earthwork Material for GRSS Slope Backfill. The material requirements contained in §733-16 B.5. *Winter Earthwork Material for Select Granular Subgrade* shall apply.

8. Winter Earthwork Material for MSES Backfill. The material requirements contained in §733-02 Type B or Type D shall apply.

C. CHARACTERISTICS.

1. No frozen material is to be incorporated into or be allowed to remain in any of the work.
2. Material of silt, clay, or high moisture content will not be permitted under any circumstances.
3. In locations where winter earthwork material has been placed to partially fill the delineated backfill area and the situation allows the Contractor to revert back to standard backfill material, the winter earthwork material shall be overlain with a geotextile separator to deter the migration of fines.

§733-16 WINTER EARTHWORK

BASIS OF APPROVAL.

A. Source Material. Sources will be approved in accordance with the geotechnical control procedure "*Procedure for the Control and Quality Assurance of Granular Materials*".

A preceding source evaluation will be valid for the time identified in the manual. For sources without a current evaluation, samples shall be obtained under the direction of the Departmental Geotechnical Engineer and will be tested and evaluated by the Geotechnical Engineering Bureau.

B. Stockpiled Material. Stockpiles of winter earthwork material will be approved by the GEB in accordance with the geotechnical control procedure "*Procedure for the Control and Quality Assurance of Granular Materials*" and the procedural directives of the GEB.

BASIS OF ACCEPTANCE.

A. Source Material. Approved winter earthwork material from approved sources for the substitution of embankment in place, select borrow, select fill, select granular fill, select granular subgrade, select structural fill, or GRSS slope backfill will be accepted upon successful completion of the gradation tests and Quality Assurance (QA) program indicating that the material conforms to the specification. If the QA program is not introduced, approved winter earthwork material will be accepted upon successful completion of the gradation tests.

B. Stockpiled Material. Backfill material from approved stockpiles will be accepted on the contract site by delivery ticket. Each delivery ticket shall identify the Suppliers name, date, NYSDOT contract number, stockpile number, item number and quantity.

Backfill material from approved stockpiles will be accepted as part of the MSES upon confirmation that the material gradation type provided by the Contractor, outlined in §733-02B *Gradation*, conforms to the MSES submittal provided by the wall system designer-supplier and upon successful completion of the Quality Assurance (QA) program indicating that the material conforms to the specification. In addition to the requirements of Section 106 *Control of Material*, the Department will sample and test backfill taken from behind the newly-constructed wall to assure quality. The number of samples and their locations (plan and elevation) will be determined by the quantity of material to be used in each MSES structure. Results from chemical testing (i.e. resistivity, sulfate ion content, sulfide ion content, and chloride ion content) can take several weeks to obtain.

§733-16 WINTER EARTHWORK

Make the following changes to the Standard Specifications dated May 4, 2006 as modified by EI 09-027:

Delete entirely §733-01 and **Replace** it with the following:

§733-16 WINTER EARTHWORK

SCOPE. This specification addresses the material requirements and methods of assessing earthwork materials placed during construction operations between November 1st and April 1st. The following materials are evaluated in this specification:

- 733.1601 – Winter Earthwork Material for Embankment In Place
- 733.1602 – Winter Earthwork Material for Select Borrow
- 733.1603 – Winter Earthwork Material for Select Fill
- 733.160401 – Winter Earthwork Material for Select Granular Fill (Typical)
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- 733.160501 – Winter Earthwork Material for Select Granular Subgrade (Blasted Rock)
- 733.160502 – Winter Earthwork Material for Select Granular Subgrade (Typical)
- 733.160503 – Winter Earthwork Material for Select Granular Subgrade (RCA)
- 733.160504 – Winter Earthwork Material for Select Granular Subgrade (RCA Mixture)
- 733.1606 – Winter Earthwork Material for Select Structural Fill
- 733.1607 – Winter Earthwork Material for GRSS Slope Backfill
- 733.1608 – Winter Earthwork Material for MSES Backfill

SAMPLING. Perform material tests and quality assurance methods pertaining to the backfill requirements in conformance with the procedures contained in the geotechnical control procedure *“Procedure for the Control and Quality Assurance of Granular Materials”*.

MATERIAL REQUIREMENTS.

A. SUPPLY

1. Source Material. Provide unfrozen backfill material from an approved source in accordance with the geotechnical control procedure *“Procedure for the Control and Quality Assurance of Granular Materials”*.

2. Stockpiled Material. Stockpile the backfill material in accordance with the geotechnical control procedure *“Procedure for the Control and Quality Assurance of Granular Materials”*.

B. GRADATION.

1. Winter Earthwork Material for Embankment In Place. Provide material consisting of rock, stone, slag, cobbles, or gravel, substantially free of shale or other soft, poor durability particles. The material shall have no particles greater than 300 mm in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material.

§733-16 WINTER EARTHWORK

TABLE 733-16A GRADATION OF WINTER EARTHWORK MATERIAL	
Sieve Size Designation	Percentage Passing by Weight
Maximum Dimension	100
½ of Maximum Dimension	0-50
6.3 mm	0-10
75 µm	0-4

The gradation is evaluated at the project level.

2. Winter Earthwork Material for Select Borrow. Provide material meeting the requirements of §733-09 *Select Borrow* with the following gradation adjustment:

The material shall have no particles greater than 1 m in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material. The gradation is evaluated at the project level.

3. Winter Earthwork Material for Select Fill. The material requirements contained in §733-16 B.2. *Winter Earthwork Material for Select Borrow* shall apply.

4. Winter Earthwork Material for Select Granular Fill. Provide material meeting the requirements of §733-11 *Select Granular Fill* with the following gradation adjustment:

The material shall have no particles greater than 100 mm in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material. The gradation is evaluated at the project level.

5. Winter Earthwork Material for Select Granular Subgrade. Provide material meeting the requirements of §733-13 *Select Granular Subgrade* with the following material and gradation adjustment:

The material shall have no particles greater than 150 mm in maximum dimension. The material shall have a gradation in accordance with TABLE 733-16A Gradation of Winter Earthwork Material. RAP shall not be used. The gradation is evaluated at the project level.

6. Winter Earthwork Material for Select Structure Fill. The material requirements contained in §733-16 B.4. *Winter Earthwork Material for Select Granular Fill* shall apply.

7. Winter Earthwork Material for GRSS Slope Backfill. The material requirements contained in §733-16 B.5. *Winter Earthwork Material for Select Granular Subgrade* shall apply.

8. Winter Earthwork Material for MSES Backfill. The material requirements contained in §733-02 Type B or Type D shall apply.

C. CHARACTERISTICS.

1. No frozen material is to be incorporated into or be allowed to remain in any of the work.

2. Material of silt, clay, or high moisture content will not be permitted under any circumstances.

3. In locations where winter earthwork material has been placed to partially fill the delineated backfill area and the situation allows the Contractor to revert back to standard backfill material, the winter earthwork material shall be overlain with a geotextile separator to deter the migration of fines.

§733-16 WINTER EARTHWORK

BASIS OF APPROVAL.

A. Source Material. Sources will be approved in accordance with the geotechnical control procedure "*Procedure for the Control and Quality Assurance of Granular Materials*".

A preceding source evaluation will be valid for the time identified in the manual. For sources without a current evaluation, samples shall be obtained under the direction of the Departmental Geotechnical Engineer and will be tested and evaluated by the Geotechnical Engineering Bureau.

B. Stockpiled Material. Stockpiles of winter earthwork material will be approved by the GEB in accordance with the geotechnical control procedure "*Procedure for the Control and Quality Assurance of Granular Materials*" and the procedural directives of the GEB.

BASIS OF ACCEPTANCE.

A. Source Material. Approved winter earthwork material from approved sources for the substitution of embankment in place, select borrow, select fill, select granular fill, select granular subgrade, select structural fill, or GRSS slope backfill will be accepted upon successful completion of the gradation tests and Quality Assurance (QA) program indicating that the material conforms to the specification. If the QA program is not introduced, approved winter earthwork material will be accepted upon successful completion of the gradation tests.

B. Stockpiled Material. Backfill material from approved stockpiles will be accepted on the contract site by delivery ticket. Each delivery ticket shall identify the Suppliers name, date, NYSDOT contract number, stockpile number, item number and quantity.

Backfill material from approved stockpiles will be accepted as part of the MSES upon confirmation that the material gradation type provided by the Contractor, outlined in §733-02B *Gradation*, conforms to the MSES submittal provided by the wall system designer-supplier and upon successful completion of the Quality Assurance (QA) program indicating that the material conforms to the specification. In addition to the requirements of Section 106 *Control of Material*, the Department will sample and test backfill taken from behind the newly-constructed wall to assure quality. The number of samples and their locations (plan and elevation) will be determined by the quantity of material to be used in each MSES structure. Results from chemical testing (i.e. resistivity, sulfate ion content, sulfide ion content, and chloride ion content) can take several weeks to obtain.