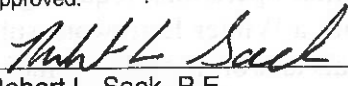


SUPERSEDED BY EB 15-031 EFFECTIVE 9/28/15		New York State Department of Transportation ENGINEERING INSTRUCTION	EI 14-011								
Title: STANDARD SPECIFICATION SECTION 304 SUBBASE COURSE											
Target Audience: <table border="0"> <tr> <td>☐ Manufacturers (18)</td> <td>☐ Surveyors (33)</td> </tr> <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	
☐ Manufacturers (18)	☐ Surveyors (33)										
☒ Local Govt. (31)	☒ Consultants (34)										
☒ Agencies (32)	☒ Contractors (39)										
	☐ _____ ()										

ADMINISTRATIVE INFORMATION:

- This Engineering Instruction (EI) is effective beginning with projects submitted for the letting of January 8, 2015.
- This EI supersedes EI 09-025
- 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 Section 304 *Subbase Course*.

TECHNICAL INFORMATION:

- Section 304 in the Standard Specifications is deleted and replaced with the revised Section 304 transmitted by this issuance.
- A revised Standard Specification §733-16 *Winter Earthwork* is being issued concurrently via EI 14-009.
- 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 554 is being issued concurrently via EI 14-012.
- The revisions to the Standard Specification Section 304 include the following:
 1. Deleted the fourth paragraph in §304-2 *Materials*.
 2. Added §304-3.01 A. *Winter Earthwork*.

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: Revision to Standard Specification Section 304 *Subbase Course*. 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.

SECTION 304 SUBBASE COURSE

Make the following changes to the Standard Specifications dated May 1, 2008 as modified by EI 09-025:

Delete entirely SECTION 304 and **Replace** it with the following:

SECTION 304 – SUBBASE COURSE

304-1 DESCRIPTION

304-1.01 General. The work consists of furnishing, placing and compacting a subbase course of the specified type in conformity with the lines, grades, thicknesses and typical sections shown in the contract documents.

304-1.02 Optional Type. When the Optional Type subbase item is specified, select any of the four (4) options as follows:

Option A. Subbase construction consisting of two (2) separate layers of Type 4 and Type 3 Subbase Course.

Option B. Subbase construction consisting of a single layer of Type 1 Subbase Course.

Option C. Subbase construction consisting of a single layer of Type 2 Subbase Course.

Option D. Subbase construction consisting of a single layer of Type 4 Subbase Course.

304-1.03 Definitions. Deleterious: Any material that does not consist of concrete, asphalt, glass, brick, stone, sand, gravel, blast furnace slag, or other materials deemed acceptable, when these materials are used in subbase in conformance with the specification requirements, OR any material which will adversely affect the performance of the product either during handling, during construction, or in its final application.

304-2 MATERIALS. Provide subbase material meeting the requirements of §733-04 *Subbase Course*.

Provide a subbase material meeting the specification requirements and is within the Contractor's capabilities to place and fine grade to the required tolerances. Should the subbase course become unstable at any time prior to the placement of the overlying course, correct the unstable condition at no additional cost to the State. Perform any required modification prior to placing the material on the grade.

RAP will not be allowed as an acceptable alternate to Types 1, 3 and 4 at intersection locations or in areas with a high percentage of truck traffic as shown in the contract documents, unless Portland Cement Concrete pavement is to be installed as part of the pavement structure. A high percentage of trucks is defined to be 10% or more. For interstates and other freeways, a DDHV of 250 vph is used to indicate a high percentage of trucks.

304-3 CONSTRUCTION DETAILS

304-3.01 General. Notify the Engineer in writing of which placement option, material option (if applicable) and/or material type is proposed for use, at least 14 calendar days prior to performing the work. If it is proposed that more than one option or type is to be used, submit a plan to the Engineer describing where each option or type is proposed for use. This plan must be approved by the Engineer prior to incorporating it into the project. The State reserves the right to disapprove the use of more than one option on a project. Use uniform subbase types and materials within the limits of the roadbed as defined in §101-02 *Definition of Terms*.

SECTION 304 SUBBASE COURSE

A. Winter Earthwork. For Contractors choosing to proceed with earthwork construction operations requiring soil compaction from November 1st thru April 1st, provide the Engineer with a Winter Earthwork submittal, with a copy to the Regional Geotechnical Engineer, in accordance with §203-3.01 A. *Winter Earthwork Submittal*. In all work incorporated into the final product, the Contractor shall not place material that is frozen, or place fill material on frozen ground.

Winter earthwork restrictions for subbase material are such that construction operations may only proceed if the air temperature, ground temperature, and material temperature is above 32° F. Therefore, the Winter Earthwork submittal shall provide details of how standard subbase material will be placed utilizing the modified methods and procedures to adjust for the weather influence on the compaction operations.

304-3.02 Placement

- Place the upper course material on the grade in a manner to minimize segregation, using equipment and procedures approved by the Engineer. Do not perform uncontrolled spreading from piles dumped on the grade.
- The maximum compacted layer thickness shall be as shown in the contract documents. In confined areas, the maximum compacted layer thickness is 6 in. The minimum loose lift thickness is 1.5 times the maximum particle size.
- Place Type 1 with a minimum compacted layer thickness of 6 in.
- Do not place Type 3 material within 4 in. of the bottom of a pavement course.
- Do not place materials blended with glass in contact with synthetic liners, geogrids, geotextiles or other geosynthetics. Ensure that glass incorporated into subbase is thoroughly mixed so that glass constitutes no more than 30 percent by weight anywhere in the subbase.
- When placing material under Option A, place and compact each material in a separate lift.

304-3.03 Compaction. When the moisture content is within the limits for proper compaction, compact the material in accordance with the requirements of §203-3.03 C. *Compaction*. Density tests are not required for the acceptance of these courses.

If a subbase course is disturbed by frost action prior to paving, re-compact the subbase.

304-3.04 Traffic and Contamination. The movement of highway traffic over the final surface of the subbase may be permitted at locations designated by, and under such restrictions as shown in the contract documents, provided such movements take place prior to the final finishing of this course to the specified tolerance. Do not allow highway traffic to move over subbase containing glass. The movement of construction equipment on this course may be permitted at locations designated by and under such restrictions as ordered by the Engineer. At locations where permission is granted for such movement, place and maintain the temporary surface of the course, upon which the construction traffic is running, at least 2 in. above the final surface of the course. Just prior to paving and after all construction traffic not required for the removal has ceased, remove the 2 in. protective layer, and prepare and compact the exposed surface of the course to the specified tolerance.

No payment will be made for furnishing, placing, maintaining, removing and disposing of the 2 in. thick protective layer. Include the cost thereof in the price bid for Subbase Course.

If the subbase is damaged or mixed with the subgrade or any other material due to the Contractor's operation, remove such material and replace it with the appropriate subbase material at no additional cost to the State.

304-3.05 Tolerance. Place Types 1, 2 or 4 so that after compaction the top surface of the course does not extend more than ¼ in. above nor more than ¼ in. below true grade for the course at any location. Place Type 3 course so that the finished surface does not extend above the true grade and surface for this course at any location.

SECTION 304 SUBBASE COURSE

304-4 METHOD OF MEASUREMENT

304-4.01 Subbase Course. The quantity is the number of cubic yards of material, computed from payment lines shown in the contract documents.

304-5 BASIS OF PAYMENT

304-5.01 Subbase Course. The unit price bid for this work includes the cost of furnishing all labor, material and equipment necessary to complete the work. Include the cost of adding water in the price bid unless the item for applying water is included in the contract. No direct payment will be made for losses of material resulting from compaction, foundation settlement, erosion, or any other cause. No deductions will be made for the volumes occupied by manholes, catch basins and other such objects.

No additional payment will be made for the protective layer, as stated in 304-3.04.

Progress payments will be made after the subbase course has been properly placed and compacted. Payment will be made at the unit price bid for 75% of the quantity. The balance of the quantity will be paid for after the final finishing to the required tolerance and just prior to the placing of the next course.

Payment will be made under:

Item No.	Item	Pay Unit
304.11	Subbase Course, Type 1	Cubic Yards
304.12	Subbase Course, Type 2	Cubic Yards
304.13	Subbase Course, Type 3	Cubic Yards
304.14	Subbase Course, Type 4	Cubic Yards
304.15	Subbase Course, Optional Type	Cubic Yards

SECTION 304 SUBBASE COURSE

Make the following changes to the Standard Specifications dated May 4, 2006 as modified by EI 09-025:

Delete entirely SECTION 304 and **Replace** it with the following:

SECTION 304 – SUBBASE COURSE

304-1 DESCRIPTION

304-1.01 General. The work consists of furnishing, placing and compacting a subbase course of the specified type in conformity with the lines, grades, thicknesses and typical sections shown in the contract documents.

304-1.02 Optional Type. When the Optional Type subbase item is specified, select any of the four (4) options as follows:

Option A. Subbase construction consisting of two (2) separate layers of Type 4 and Type 3 Subbase Course.

Option B. Subbase construction consisting of a single layer of Type 1 Subbase Course.

Option C. Subbase construction consisting of a single layer of Type 2 Subbase Course.

Option D. Subbase construction consisting of a single layer of Type 4 Subbase Course.

304-1.03 Definitions. Deleterious: Any material that does not consist of concrete, asphalt, glass, brick, stone, sand, gravel, blast furnace slag, or other materials deemed acceptable, when these materials are used in subbase in conformance with the specification requirements, OR any material which will adversely affect the performance of the product either during handling, during construction, or in its final application.

304-2 MATERIALS. Provide subbase material meeting the requirements of §733-04 *Subbase Course*.

Provide a subbase material meeting the specification requirements and is within the Contractor's capabilities to place and fine grade to the required tolerances. Should the subbase course become unstable at any time prior to the placement of the overlying course, correct the unstable condition at no additional cost to the State. Perform any required modification prior to placing the material on the grade.

RAP will not be allowed as an acceptable alternate to Types 1, 3 and 4 at intersection locations or in areas with a high percentage of truck traffic as shown in the contract documents, unless Portland Cement Concrete pavement is to be installed as part of the pavement structure. A high percentage of trucks is defined to be 10% or more. For interstates and other freeways, a DDHV of 250 vph is used to indicate a high percentage of trucks.

304-3 CONSTRUCTION DETAILS

304-3.01 General. Notify the Engineer in writing of which placement option, material option (if applicable) and/or material type is proposed for use, at least 14 calendar days prior to performing the work. If it is proposed that more than one option or type is to be used, submit a plan to the Engineer describing where each option or type is proposed for use. This plan must be approved by the Engineer prior to incorporating it into the project. The State reserves the right to disapprove the use of more than

SECTION 304 SUBBASE COURSE

one option on a project. Use uniform subbase types and materials within the limits of the roadbed as defined in §101-02 *Definition of Terms*.

A. Winter Earthwork. For Contractors choosing to proceed with earthwork construction operations requiring soil compaction from November 1st thru April 1st, provide the Engineer with a Winter Earthwork submittal, with a copy to the Regional Geotechnical Engineer, in accordance with §203-3.01 A. *Winter Earthwork Submittal*. In all work incorporated into the final product, the Contractor shall not place material that is frozen, or place fill material on frozen ground.

Winter earthwork restrictions for subbase material are such that construction operations may only proceed if the air temperature, ground temperature, and material temperature is above 0° C. Therefore, the Winter Earthwork submittal shall provide details of how standard subbase material will be placed utilizing the modified methods and procedures to adjust for the weather influence on the compaction operations.

304-3.02 Placement

- Place the upper course material on the grade in a manner to minimize segregation, using equipment and procedures approved by the Engineer. Do not perform uncontrolled spreading from piles dumped on the grade.
- The maximum compacted layer thickness shall be as shown in the contract documents. In confined areas, the maximum compacted layer thickness is 150 mm. The minimum loose lift thickness is 1.5 times the maximum particle size.
- Place Type 1 with a minimum compacted layer thickness of 150 mm.
- Do not place Type 3 material within 100 mm of the bottom of a pavement course.
- Do not place materials blended with glass in contact with synthetic liners, geogrids, geotextiles or other geosynthetics. Ensure that glass incorporated into subbase is thoroughly mixed so that glass constitutes no more than 30 percent by weight anywhere in the subbase.
- When placing material under Option A, place and compact each material in a separate lift.

304-3.03 Compaction. When the moisture content is within the limits for proper compaction, compact the material in accordance with the requirements of §203-3.03 C. *Compaction*. Density tests are not required for the acceptance of these courses.

If a subbase course is disturbed by frost action prior to paving, re-compact the subbase.

304-3.04 Traffic and Contamination. The movement of highway traffic over the final surface of the subbase may be permitted at locations designated by, and under such restrictions as shown in the contract documents, provided such movements take place prior to the final finishing of this course to the specified tolerance. Do not allow highway traffic to move over subbase containing glass. The movement of construction equipment on this course may be permitted at locations designated by and under such restrictions as ordered by the Engineer. At locations where permission is granted for such movement, place and maintain the temporary surface of the course, upon which the construction traffic is running, at least 50 mm above the final surface of the course. Just prior to paving and after all construction traffic not required for the removal has ceased, remove the 50 mm protective layer, and prepare and compact the exposed surface of the course to the specified tolerance.

No payment will be made for furnishing, placing, maintaining, removing and disposing of the 50 mm thick protective layer. Include the cost thereof in the price bid for Subbase Course.

If the subbase is damaged or mixed with the subgrade or any other material due to the Contractor's operation, remove such material and replace it with the appropriate subbase material at no additional cost to the State.

304-3.05 Tolerance. Place Types 1, 2 or 4 so that after compaction the top surface of the course does not extend more than 6 mm above nor more than 6 mm below true grade for the course at any location.

SECTION 304 SUBBASE COURSE

Place Type 3 course so that the finished surface does not extend above the true grade and surface for this course at any location.

304-4 METHOD OF MEASUREMENT

304-4.01 Subbase Course. The quantity is the number of cubic meters of material, computed from payment lines shown in the contract documents.

304-5 BASIS OF PAYMENT

304-5.01 Subbase Course. The unit price bid for this work includes the cost of furnishing all labor, material and equipment necessary to complete the work. Include the cost of adding water in the price bid unless the item for applying water is included in the contract. No direct payment will be made for losses of material resulting from compaction, foundation settlement, erosion, or any other cause. No deductions will be made for the volumes occupied by manholes, catch basins and other such objects.

No additional payment will be made for the protective layer, as stated in 304-3.04.

Progress payments will be made after the subbase course has been properly placed and compacted. Payment will be made at the unit price bid for 75% of the quantity. The balance of the quantity will be paid for after the final finishing to the required tolerance and just prior to the placing of the next course.

Payment will be made under:

Item No.	Item	Pay Unit
304.11	Subbase Course, Type 1	Cubic Meter
304.12	Subbase Course, Type 2	Cubic Meter
304.13	Subbase Course, Type 3	Cubic Meter
304.14	Subbase Course, Type 4	Cubic Meter
304.15	Subbase Course, Optional Type	Cubic Meter