

TO: Director, Preliminary Plan Review Bureau  <b>SUPERSEDED BY EI 76-044</b> <b>EFFECTIVE 6/16/1976</b>	<b>ENGINEERING INSTRUCTION</b> NEW YORK STATE DEPARTMENT OF TRANSPORTATION
Distribution: <input checked="" type="checkbox"/> Main Office <input checked="" type="checkbox"/> Regions <input type="checkbox"/> Special	Code: <u>EI 75-96</u> Date: <u>12/17/75</u>
APPROVED: <u><i>Jack Stembach</i></u> Deputy Chief Engineer (Construction)	Supersedes:

The Department's Standard Specifications of 1973 state under 203-3.10, "Embankment material shall not be placed on frozen earth nor shall frozen soils be placed in any embankment." The Technical Services Subdivision advises that it is virtually impossible to properly construct embankments during freezing weather without violating this requirement. Paragraph 203-3.01 states, "Embankment construction operations shall not be performed from November 1 to April 1 except with written permission of and under such special conditions and restrictions as may be imposed by the Regional Director." The intent of such waiver is to afford flexibility to permit constructing embankments of rock and to take advantage of prolonged periods of mild weather which sometimes occur between the above dates.

Limitations on "winter" earthwork operations resulted from a series of costly experiences with embankment failures and pavement settlements that occurred during the late 40's and 50's which upon investigation, were traced to "winter" construction. The limitations were also based upon extensive research conducted by the Soil Mechanics Bureau during the winter of 1957-58 on FISH 57-17 (I-87.) Briefly, the research proved that all soils, including "clean" granular materials which may appear to be dry and free of frozen clods, cannot be properly and adequately compacted to conform with the requirements of the Department's specifications when the temperature of the soil is much below 32°F. This is because the soil moisture, which is necessary to act as a lubricant for adequate compaction, has turned into a solid in the form of ice, and the soil then acts as a dry material during the compaction process. Therefore, gravel materials may actually be frozen even though they may not appear so or do not contain frozen clods, and should not be placed in embankments or trenches during freezing weather.

It is also important that embankment material not be placed on frozen embankments. Investigation of embankment stability failures that occurred in the mid-summer has indicated that the failures were due to the melting of layers and lenses of ice that were covered with fill material when embankment construction resumed that spring. Therefore, investigation should be made of existing embankments before commencing filling operations after freezing weather.

In accordance with 203-3.01, Regional Directors may, at their discretion, issue written permission to conduct the following earthwork operations during the "winter" months: (a) excavation of soil and/or rock, (b) stockpiling excavated material, (c) construction of embankments using

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rock only, (d) underwater backfill. It is extremely important that all construction engineers be instructed that, with the exception of the aforementioned operations (a) through (d), good earthwork construction construction cannot be accomplished during periods of freezing weather.

Therefore, requests for any other type of earthwork construction during the winter months, including subbase, and fill and backfill at structures, culverts, pipes, and conduits should be generally denied. Consideration, however, may be given to special instances where small amounts of work are necessary to complete earthwork operations and thereby provide benefits in the public interest. Under such extenuating circumstances, the related conditions should be very carefully investigated and approval granted only during extended periods of above freezing temperatures and only after investigation reveals no frost remaining in the existing ground and in the gravel or earth banks or stockpiles. The written approval by the Regional Director should contain these conditions for guidance to project personnel. A copy of such written permission extended to operations other than (a) through (d) above should be sent to the Deputy Chief Engineer (Construction.)