

NTTA Projects	Original Issue Date: 12/11/2009	CRV-02-A2
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Title: Examples of Selecting Random Locations for OV Samples and Tests		

The OV testing technicians shall follow the 2-step process described in the following examples in order to give consideration of all elements of work to have an equal chance of being randomly sampled and tested. This 2-step process is necessary due to the lower OV testing frequencies as compared to the Project testing frequencies. The first step consists of selecting a stratified random production unit, quantity, distance, or area to be targeted for sampling or testing by initially stratifying (distributing) the estimated total production units, quantity, distance or area and applying a random number to the stratified production units. The second step consists of selecting and applying another random number(s) to the stratified random production unit to determine the random sampling and testing location.

Example 1

NTTA's Guide Schedule for Project Sampling and Testing for Item 340 requires one sample per day for the determination of asphalt content.

Step 1 - To achieve a 10% OV sampling and testing rate of the Project level testing frequency, the OV will initially obtain and apply a random number (e.g. 0.43) to an estimated production unit of 10 days to determine which production day (5th day) the OV sample will be taken for a specific mix design.

Step 2 - Upon the selected random production day for the OV sampling and testing, a second random number (e.g. 0.57) is obtained and applied to the total estimated tonnage (2000 tons) to be placed on the 5th day. The OV sample will be obtained from the truck that carries the target cumulative load of 1140 tons (e.g. 0.57X2000).

Example 2

Where density control is required for embankment construction, TxDOT Standard Specification Item 132 requires each layer (or lift) to be tested for density and moisture content.

Step 1 - To achieve a 10% OV testing rate of the Project level testing frequency, the OV will initially identify the area under construction by a particular crew and estimate the number of lifts and density tests for the identified area to reach completed subgrade elevation. The OV personnel will divide the estimated Project density tests into equal sampling units of not greater than 10 – e.g. 24 estimated Project density tests divided into 3 sampling units of one OV density test for each 8 Project density tests for the identified area. Adjustment to the sampling unit will be allowed as the construction activity and progress varies due to lot size and lift thickness of the Project tests performed. The OV personnel will obtain and apply a random number to the predetermined sampling unit (8 lifts for example) and determine the lift of earth work to be tested.

Step 2 - Upon finishing the target lift, the OV personnel will select and apply two random numbers to the lot to be tested and determine the location of the OV density and moisture content tests. This process will be applied to the specific earthwork features such as common fill, select backfill, etc. to meet the requirements of statistical validation of the Project and OV test results.

Example 3

NTTA's Guide Schedule of Project Sampling and Testing for structural concrete requires testing of two sets (4 specimens) of compressive strength cylinders for each 60 cubic yards and fractions thereof per class.

Step 1 - To achieve a 10% OV testing rate of the Project testing frequency, the OV will perform weekly review the rolling 3-week schedule and estimate the quantity and number of structural concrete placements that will take place for each class and mix design. Based on this estimate, the number of concrete placements for each class and concrete mix design will be divided into equal sampling units of not greater than 10 – i.e. 38 estimated Project compressive strength tests divided into 4 sampling units of one OV compressive strength test for each 10 Project compressive strength tests.

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Adjustment will be made to the sampling unit as the construction activity and progress vary due to changes in placement quantity and scheduling of the work. The OV personnel will obtain and apply a random number to the predetermined sampling unit (e.g. 10 concrete placements of Class C concrete for the first 3 sampling units and 8 placements for the 4th sampling unit) and determine the target concrete placement to be sampled and tested.

Step 2 - For the target concrete placement to be sampled and tested by OV, the specific truck or load of concrete to be sampled and tested will be determined by applying a random number to the estimated number of loads to complete the scheduled concrete placement. The random load or truck will be sampled and tested by the OV testing technician.

REVISION HISTORY:

Revision	Revised by	Date Issued	DRN#	Reason for Revision
0	John Roberts	12/11/2009	10067	Original Issue