

AGREED WORKING PROCEDURES



Compliance Testing Advice Note

The attached Coring Advice Note was agreed.

Copy attached.

Cross Reference Information:

NRSWA 1991 : 72
Code of Practice : INSPECTIONS / SEHAUC SPECIFIC
Regulations : No. 1688 (INSPECT. FEES.)
SEHAUC Meeting: : 16th December 2005

Signed:

Chairman

Vice-Chairman

This item is registered under the SEHAUC administration reference:

SE/ 72 / 041

Secretary

Date 16/12/2005

Revision	Made by	Comment

Compliance Testing Advice Note

1. Introduction

It is clear that non compliant reinstatements have an effect on many aspects including reduced residual life of road networks, increased remedial costs, additional congestion and disruption to the highway user, all of which place an additional burden on UK PLC.

There are many aspects to compliance testing, ranging from material thicknesses and type, compaction, surface quality and engineering/physical properties. Any testing for compliance must also be carried out in a consistent way and reports on the outcomes used to assist in performance measurement.

It is vital that all reinstatements are carried out in accordance with the relevant specification to ensure long-term performance of both the reinstatement and the surrounding construction.

The actual methods of compliance testing ranges from coring, excavating trial pits, surface regularity, texture depth, material types and compaction, although this list is not exclusive of other methods.

The information and details contained in this Advice Note do not override any requirements of the New Roads and Street Works Act 1991, Health and Safety legislation, traffic management act and procedures etc.

This guidance note will only deal with coring and trial pits. Advice on the other compliance testing techniques is well documented and may be found elsewhere.

2 Purpose

The purpose of this Advice Note is:

- to set out an agreed regional framework for Highway Authorities and Utilities when they carry out coring activities, and
- to advise on where trial pits may be an alternative to coring, and
- to ensure the integrity, quality and consistency of results obtained, and
- to enable valid local, regional and national performance to be monitored on the basis of a common set of guidelines, and
- to promote continuous improvement in undertaker and contractor reinstatement practices as part of a Quality Management system.

The purpose of carrying out compliance testing by either an Utility or a Highway Authority, is to ensure that the relevant specification for reinstatement is being adhered to. Where failures are identified appropriate corrective action should be taken and future standards improved through training.

3 Sample Selection & Identification Procedure

Sample selection

The selection of sites is an important process. The aim is to gain a representative sample of reinstatements and their associated compliance with the relevant specification.

The sample selection for coring is a two part process. The first part involves random selection of sites from the Street Works Register. The second part involves removing unsuitable sites, e.g. verge, flags, cobbles etc. and then

prioritising the remaining sites. It is from this list that sites are selected for investigation ensuring a cross section of completed works and a balanced selection.

The selection of sites for trial pit excavation may use any of those samples deemed unsuitable for coring.

Trial pit excavation may follow a core sample where more investigative work is considered desirable. Additionally trial pits will be used where there is confusion over the 'ownership' of the reinstatement and/or the Highway Authority cannot determine which notification (if any) is applicable to that reinstatement.

Initial sample size

The initial sample size for each Highway Authority will be based on the latest agreed annual inspection units for the sample year. The sites will be selected from an initial random sample of 10 per cent of inspection units created in the last six months (i.e. equivalent to category B inspections), in accordance with the sample selection procedure in section 2.3.4 of the Code of Practice for Inspections. This value of 10 per cent is chosen to ensure that sufficient sites are available for coring after unsuitable sites have been removed, as described above.

Based on the latest agreed inspection units and the variable workloads of Utilities, a 2 per cent sub-sample for coring is the suggested minimum annual sample size or a minimum of 10 cores per statutory undertaker in each highway authority area, if appropriate. This will ensure a sample size for a statistically reliable result.

Performance based sample size

A scaled sampled selection may be applied such as an increase or decrease in % based on results. See table 2.

Prioritisation

Care is required in finalising the actual sites for coring from the initial sample. The benefit of this approach is that the performance of different aspects of undertaker performance can be targeted regionally focusing, for instance, on carriageway or footway sites.

The reinstatements selected for compliance testing by a Promoting Body must be:-

- a) works notified within the Street Works Register.
- b) selected at random.

Either the Undertaker or Highway Authority may carry out other investigatory works outside the random sample as required.

Identification

Clearly a vital element of any Programme is the identification of the work's promoter; therefore it is advised that any pre visit and marking of sites should be a joint exercise to avoid disagreement following the results.

All cores must be clearly identified by the Utility's and/or Highway Authority's reference numbers.

Reinstatements identified for coring can be identified by one or more of the following methods:

- a) by a circle painted on each reinstatement
- b) by a photograph taken showing the circle and the reinstatement in relationship to its surroundings.
- c) by a plan (1:1250) indicating the position of the reinstatement in the street.

Notification requirements

In order to ensure that interested parties are able to monitor the compliance testing operation, personnel undertaking the investigation are to notify both the Highway Authority and work's promoter at least one month and then seven calendar days before the commencement of the programme. In addition they should keep parties up to date on the daily testing programme and also provide means of contact e.g. mobile phone etc.

i) Coring of sites

The key elements of the compliance testing methodology for the investigation of Utility reinstatements are detailed below and be carried out by a UKAS accredited laboratory, with the appropriate UKAS accreditation.

- a) Cores shall be 100mm size diameter, minimum.
- b) Cores shall be taken in the surface course, binder course and base (roadbase) layers (where present).
- c) Care shall be taken with cores adjacent to ironwork. Core should be extracted away from the perimeter of the structure below and at least 100mm clearance from any leading edge of ironwork.
- d) Generally, cores shall be taken with at least 100mm clearance from any joint edge and located as near to the centre of the reinstatement as possible.
- e) For trench reinstatements less than 50m long, the core shall be taken mid way between the longitudinal edges of the trench, approximately half way along the trench. Where the trench reinstatement is longer than 50m, the core should be taken 25m from one end. Consideration should be given as to whether cores ought to be extracted close to the ends of a trench because it is known that compaction is more difficult here and optimum compaction may not be reached.
- f) If a selected site exhibits an obvious visual defect this should be actioned through the routine defect regime and not investigated.
- g) Bar holes and reinstatements less than 250mm x 250mm shall be excluded.
- h) Cores shall be uniquely referenced, labelled and photographed. All cores shall be transported carefully and stored for a minimum of four weeks after presentation of results, unless locally agreed.
- i) Cores shall be limited to one per reinstatement with preference towards carriageway sites. Where an opening includes both carriageway and footway reinstatements preference shall be given to the carriageway site.
- j) The reinstatement of core holes shall be carried out in accordance with the Specification for the Reinstatement of Openings in Highways: A Code of Practice -Ancillary Activities, S11.5 Test Holes.
- k) A Highway Authority or Utility may choose to investigate the unbound layers to determine depth of layer, material, compaction and moisture content.
- l) When unbound layers are investigated, care must be taken and refer to HSG47 for guidance.
- m) Void testing of the unbound material may be undertaken.

ii) Trial pits

All trial pit excavations must be carried out by hand using appropriate plant and equipment. The guidelines and recommendations of HSG47 shall be adhered at all times.

At any permanent or interim reinstated site, a trial pit may be excavated to identify the owner of the plant underneath the highway surface, to measure the full depth to the plant and the thickness and type of material used in the works.

A trial pit will need to be of sufficient dimensions to ensure safe working at all times. Generally the '45 degree' rule may be applied from the centre of the excavation but as a minimum a 1 metre square excavation is recommended. All trial pits of a depth greater than 1.2 metres must be assessed for shoring and if required must be installed and removed by competent operatives.

Samples of each layer must be taken and accurate logging of the layers, type and thickness, should be supported by clear photographic evidence showing depth and thickness.

Testing for compaction of unbound layers may take place at any depth using accepted methods and equipment whilst exercising care to avoid damage to underlying plant.

The reinstatement of trial pits shall be carried out in accordance with the relevant specification.

5 Analysis and interpretation of results

- a. The initial analysis and interpretation of the results, provided by the UKAS accredited supplier, must be undertaken by experienced Highways Authority staff or other nominated personnel. Copies of the results must be provided to the relevant Utility including photographs. Local discussions should be held between the Highways Authority and Utility, to agree the results of the programme because they may form the basis of local, regional and eventually national reports.
- b. In instances where an Utility carries out a coring programme and presents the results of that programme to the Highway Authority, the Highway Authority will not issue 'defective reinstatement' notifications where the results show a reinstatement to be defective, however, the Utility will have three months to correct any defect. A notice must be served on the Highway authority, failure to do so may result in a defect inspection.

6. Detailed analysis

Reinstatements must comply with the relevant specification and detailed analysis of the recovered core and/or layer samples will include:

- Measurement of the thickness of each layer of material, at four points or more equally spaced round the core, measurements to be averaged. A comparison with the specified carriageway/footway category design thickness and an assessment of the materials with respect to the relevant specification.
- A description of each layer of material in generic terms: i.e. HRA, material to BS4987 etc.
- A description of the nominal aggregate size and a comparison to that of the specified material.
- A photographic record of the core and/or trial pit excavated face, with a suitable scale of a quality that allows layers to be identified.
- a visual assessment of bound materials describing the amount of voiding as:
 - Lightly voided
 - Voided
 - Heavily voided.
 - From the results of these analyses, the core/excavation must be classified as either a 'PASS' or 'FAIL'.

All results must be distributed through electronic means.

7. Failure classification system

The core must be classified as either a "PASS or FAIL". In the case of a 'FAIL' classification, the extent of the non-compliance and the appropriate non-compliance description shall be reported as defined in Table 1.

Table 1 Failure classification system

Category	Non-compliance description	Extent of non compliance
Overall Thickness (OT)	FAIL (OTA)	0-10mm
	FAIL (OTB)	11-30mm
	FAIL (OTC)	31-50mm
	FAIL (OTD)	51-70mm
	FAIL (OTE)	>70mm
Layer Thickness (Surface Course) (SC) from nominal values	Within Tolerance (SCA)	0- -5mm
	FAIL (SCB)	-6-10mm
	FAIL (SCC)	-11-15mm
	FAIL (SCD)	-16-20mm
	FAIL (SCE)	>-20mm
Layer Thickness (other Bound Material) (BM)	Within Tolerance (BMA)	0-10mm
	FAIL (BMB)	11-30mm
	FAIL (BMC)	31-50mm
	FAIL (BMD)	51-70mm
	FAIL (BME)	>70mm
Air voids content in excess of Table S10.1 of Specification.	FAIL(AVA)	0-2%
	FAIL (AVB)	>2%- 6%
	FAIL(AVC)	>6%
Visual assessment of compaction	ADVISE (CLV)	Lightly voided
	ADVISE (CV)	Voided
	ADVISE (CHV)	Heavily voided

Note:

OT = Overall thickness, SC = Surface Course layer thickness, BM = Layer thickness of bound material, C = Compaction, AV= Air voids.

FAIL (OTD) would describe a failure in terms of overall thickness (OT) in the range 51-70mm below that permitted in the Specification (after tolerances have been taken into account)

See appendix 1 for worked example.

- The core/trial pit details will be distributed to each Utility /Highway Authority as appropriate.
- All Core and trial pit samples taken must be individually bagged and identified (with an option to inspect).
- Samples will be retained for a minimum of 4 weeks (unless otherwise requested) from the notification of results.
- The following action may be taken:-
 - Request for a meeting to discuss the overall situation and the action to be taken.
 - Request from a Utility to a Highway Authority to discuss compliance with the relevant specification.
 - Recovery plan and agree timescales to rectify failures.

In instances where the Highway Authority has carried out compliance testing the details will be forwarded to the Utility/works promoter with a covering 'defective reinstatement' notification as appropriate, referring to the attached information.

8 Performance based sample selection

Table 2

Performance	Random sample %	Actual sample %
76% and above	10	2
75 – 51 %	20	10
50% and below	50	20

9 Conflict resolution

In the event of non-agreement between the Highway Authority and Utility the following procedure should be adopted:

The dispute shall be considered in full by representatives of the regional HAUC. In the event that the dispute still cannot be resolved, it should be presented, in writing, to the regional HAUC committee for consideration.

10 Reporting Procedures

A full report of each core sample taken shall be retained by the originator and made available if requested.

A quarterly summary of the results shall be sent to the SEHAUC Secretary or nominated representative in accordance with agreed timescales. The Highway Authorities shall use Form C2a. Undertakers shall use form C2b

The SEHAUC Secretary or nominated representative will then provide an overall Summary for SEHAUC, using Form C1.

- a) A summary report of quarterly results should be presented at regional HAUC by the relevant Highway Authority showing the following information.
 - Name of Promoting Authority
 - Time period covered by report
 - Total number of cores
 - Total number of trial pits
 - Footway/carriageway split
 - Overall compliance rate
 - Breakdown of reasons for failures using the failure classification system.
 - Breakdown of results by works promoter
 - Areas where improvements have been made
- b) A monthly summary report of results should be distributed to the relevant Highway Authority/Utility showing the following information.
 - Name of Promoting Authority
 - Time period covered by report
 - Total number of cores
 - Total number of trial pits
 - Footway/carriageway split

- Overall compliance rate
- Breakdown of reasons for failures.
- Breakdown of results by works promoter
- Areas where improvements have been made

The following additional information will normally be provided on test results.

- a) Utility NRSWA reference number and site number where appropriate as per Appendix E.
 - b) Location address.
 - c) Date core taken.
 - d) Date trial pit excavated.
 - e) If carriageway, footway or cycle track.
 - f) Existing reinstatement category
 - g) Coring and/or trial pit result.
 - h) Analysis of result..
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- i) The permanent guarantee dates for the reinstatement cored.
 - j) Details of the Company/Laboratory that carried out the testing together with their status, e.g. UKAS accredited.

11 Financial Arrangements

In the case any reinstatement tested for compliance by a Highway Authority, that does not comply with the relevant specification the Highway Authority will be reimbursed their agreed costs.

- Core Pass: No cost to Utility/works promoter.
 - Trial Pit Pass: No cost to the Utility/works promoter
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- Fail Replace – Normal defect inspection regime plus reasonable costs of the investigation.

12. Funding of Programmes

It is beneficial to all parties to understand the consequences of non compliance, therefore it is strongly recommended that all programme results are shared amongst the interested parties as a first step, encouraging a jointly funded programme using one UKAS accredited contractor with open agreed results.

Appendix 1

Worked example

For a given reinstatement in the carriageway the overall design thickness of bound material is 190mm comprising 40mm surface course and 150mm of 'other bound material'.

Analysis of the coring indicates an overall thickness of bound material of 160mm comprising 30mm of surface course material and 130mm of 'other bound material'.

- a) In terms of the overall thickness of bound material, the minimum allowable thickness, in accordance with SA2.5, would be 175mm (190mm-15mm tolerance). Therefore, the result, in terms of overall layer thickness, would be reported as 'FAIL(OTB)'.
- b) Similarly, the minimum thickness of the surface course, in accordance with SA2.5, would be 35mm (40mm-5mm tolerance for surface course). Therefore, the result in terms of surface course thickness would be reported as 'FAIL (SCA)'.
- c) The minimum thickness of 'other bound material' would be 140mm (150mm-10mm tolerance). Therefore, the result in, in terms of the thickness of other bound material would be reported as 'FAIL(BMA)'.

Therefore, in this instance, the result for this core could be reported using the following format.
FAIL(OTB)(SCA)(BMA).

The benefit of this approach is that, while failures are still reported, the broad extent of non-compliance can be assessed, over time, on both a local and regional basis. For instance, utility A may have a non-compliance rate of 30 per cent with three quarters of the failures rated as 'FAIL(OTE)' in a given year (i.e. failing on 'overall thickness' by more than 70mm after tolerances have been taken into account). Improvements in performance would be evident even if the non-compliance rate remained at 30 per cent but the majority of failures changed from, say, 'FAIL(OTE)' to FAIL(OTA) i.e. instead of missing the overall thickness by more than 70mm, the undertaker is failing to comply by less than 10mm). Thus, whilst the headline performance has not improved, the underlying performance would show a marked improvement and indicate that higher compliance rates are achievable when further small improvements in workmanship are made. (CSS compliance test project 2005)

Appendix 2

See attached spreadsheet SEHAUC Coring form C1.xls

Appendix 3

See attached spreadsheet SEHAUC Coring Form C2 .xls