



**ROADS AUTHORITIES & UTILITIES COMMITTEE
(SCOTLAND)**

**NATIONAL CORING REPORT
2022/23 PROGRAMME**

October 2023

Contents

1.	INTRODUCTION	1
2.	PROGRAMME IMPLEMENTATION	1
3.	RESULTS.....	2
4.	CONCLUSIONS	4
5.	RECOMMENDATIONS	5
	APPENDIX NC1 NUMBERS OF PASS/FAIL BY AUTHORITY.....	6
	APPENDIX NC2 NUMBERS FOR PASS/FAIL BY UTILITY	9
	APPENDIX NC3 CORE FAILURE ANALYSIS	11
	NoS RAUC Area.....	12
	TayForth RAUC Area.....	12
	SW RAUC Area	12
	SE RAUC Area	12
	WoS RAUC Area	12
	Transport Scotland	12
	APPENDIX NC4 UTILITY SECTOR ANALYSIS.....	13

NATIONAL CORING REPORT 2022/23

1. INTRODUCTION

This report presents the findings of the National Coring Programme 2022/23.

2. PROGRAMME IMPLEMENTATION

- 2.1 The National Coring Programme was developed and implemented at Area RAUC level including Transport Scotland. Built on the lessons learned in the previous programmes, RAUC(S) set a timetable for the exercise across the five Areas as laid out within Advice Note 3 v11.1. It is important to note that the National Coring Programme only investigates the compliance of the asphalt layers and not the unbound/cementitious layers below.
- 2.2 Elements of the programme were delivered within timescales, however, there were significant issues encountered in agreeing and verifying sample selection and results. The Lead Authority for the Tayforth Area failed to procure a coring contractor within the appropriate time scale. However, after discussion with RAUC(S) a revised timetable was agreed and a contractor was commissioned to carry out coring and testing. All roads authorities within the Tayforth area were able to participate in full, with the exception of Perth and Kinross who had failed to agree core locations with two statutory undertakers. Angus Council did not participate at all. In the NoS RAUC area Orkney Islands Council and Shetland Islands Council also did not participate at all. A similar problem occurred with the Transport Scotland - South West Operating Company who failed to report any cores within the required timescales. These issues had an impact on the delivery of the overall programme which resulted in a delay in producing the final report.
- 2.3 The methodology and specification for the coring programme is detailed within Advice Note 3 v11.1, which was approved by RAUC(S) and formed the basis for all five Area programmes. Lead Authorities were identified in each of the five areas who coordinated the Coring Programmes for the individual roads authorities, as well as administering the contract for each UKAS accredited testing laboratory for their area.
- 2.4 As agreed in previous programmes the reasonable costs of the Lead Authority would be recovered from the roads authorities on a pro-rata basis from the Coring results. The costs of any failed Cores are borne by the appropriate statutory undertaker responsible for the reinstatement tested.

3. RESULTS

3.1 The overall National Coring Programme results for 2022/23 are detailed in the table below. The Appendices at the rear of this document will provide more detail on the individual statutory undertaker, RAUC(S) areas, Local Authority areas and failure types for the 2022/23 programme. All national coring inspection results have been logged onto the Scottish Road Works Register (SRWR).

Year	2005/6	2008/9	2010/11	2012/13	2015/16	2019/20	2022/23
No. Cores	1340	1566	1349	1534	1535	1666	1764
Pass	60%	64%	74%	83%	82%	88%	90%
Fail	40%*	36%*	26%	17%	18%	12%	10%

Table 3.1 – National Coring Results

* Denotes years in which failures were classified as either “Fail Monitor” or “Fail Replace”. From 2011 onwards, it was agreed at RAUC(S) to remove the “Fail Monitor” category as an option.

3.2 The details of the individual results for each Area RAUC’s should be discussed and reviewed at the area level. These are held within this report only for reference.

3.3 The results of the 2022/23 programme show improvement compared to all the previous programmes. The following aspects are of note and to be considered:

- The overall result shows an improvement of 2% from previous programme.
- The sample size overall is larger to that of previous programmes.
- The number of statutory undertakers that achieved the 90%, or near, pass rate threshold has increased to 8.

3.4 Within the Sample Period for the reinstatements (1 January 2021 to 31 December 2021). The sample size, 1764, is nominally 2% of all works carried out during this period.

3.5 From the table below the following are worthy of note.

Reason for Failure	2022/23 programme					2019/20 Programme		
	Number of failures	Fail rate as % of total cores (1764)	Change from previous	Fail Rate as % of Failed cores (180)	Change from previous	Number of failures	Fail rate as % of total cores (1666)	Fail Rate as % of Failed cores (201)
Layers	104	5.9%	down 2.7%	58%	down 13%	143	8.6%	71%
Voids	27	1.5%	No change	15%	up 3%	25	1.5%	12%
Materials	42	2.4%	down 0.8%	23%	down 4%	54	3.2%	27%
Bonding / Other	20	1.1%	down 1%	11%	down 6%	35	2.1%	17%

Table 3.2 – National Coring Programme Reasons for Failure

- The main mode of failure was insufficient Asphalt layer thicknesses at 5.9% of cores. However, at 104, it accounts for a rate of 58% of all failed cores.

- The greatest decrease was in Asphalt layer thicknesses, falling from 8.6% to 5.9% against total 104 cores or by 13% of failures.
- Materials failures reduced by 0.8% of cores, there being 42. There is a 4% decrease of rate against the number of all failures.
- “Other” type which mainly includes De-Bonding had 20 which is 1.1% of all cores or 11% of all failures.

Please Note: The total number of failures adds up to more than 100% of failed cores. i.e. there are 193 failures from 180 failed cores. This is because some cores had more than 1 failure per result and records need to be taken for all to make analysis of the issues worthwhile.

3.6 All of the results contained within this document can be found on the Scottish Road Works Register.

4. CONCLUSIONS

- 4.1 This is the first coring programme that has met the threshold pass rate of 90%. There remains an issue throughout the RAUC(S) community given 9 out of the 15 undertakers did not achieve 90%.
- 4.2 Based upon the results of this programme, the RAUC(S) National Coring Working Group recommend continued testing to ensure compliance with the SROR.
- 4.3 Layer Depth remains the predominate reason for failure.
- 4.4 Across the five area RAUCs three areas have met the 90% target, with a variance of around 9% between the highest and lowest.
- 4.5 Across the four utility sectors, two sectors exceeded the 90% target.
- 4.6 Analysis of the failure results identified the following issues, indicating poor quality control and/or supervision: -
 - Correct layer depth is relatively easy to achieve, the information being readily available and easily measured at the time of reinstatement. It is concerning that layer depth continues to form such a high failure rate, at 58% of all failed cores, when this is easily avoided with due diligence.
 - Air Void content is one of the more difficult features to accurately assess by visual means. At a failure rate of 15% of all failed cores, a reduction in voiding failures can easily be achieved by correct temperature control and compaction.
 - Material failures at a failure rate of 23% of all failed cores could be reduced by correct identification and ordering prior to reinstatement.
 - A reduction in bonding failures from 11% of all failed cores can be achieved by thorough cleaning of surfaces and application of an appropriate tack coat or bond coat, correctly applied to bound substrates.
- 4.7 Advice Note 3 v11.1 had clear programme dates and detailed what was required by all involved to deliver. As with previous coring programmes, commitment and availability of experienced resources would appear to be the primary reason why the programme overran some milestones. Poor communication between parties was also a factor for the delay in confirming the agreed results.

5. RECOMMENDATIONS

It is recommended that;

- 5.1 A further National Coring Programme be carried out to encourage continuous improvement, by monitoring and benchmarking results against other measures put in place. All to drive and maintain high standards of reinstatement.
- 5.2 All roads authorities fully participate in future coring programmes.
- 5.3 Although the overall target of 90% has been achieved within this programme, there is still a requirement by some undertakers to review their processes and responsibilities when reinstating, such as quality control and supervision of the works to ensure improvement. A review should be carried out to identify good practice from within the RAUC(S) community to promote continued improvement.
- 5.4 It was clear that as the programme progressed through the various milestones that poor communications, lack of knowledge and understanding of the subject matter was delaying progress. It is proposed a questionnaire is circulated to the community to understand what issues arose and how these issues were overcome. The questionnaire results will be reviewed by the RAUC(S) National Coring Working Group to propose changes to Advice note 3 v11.1 or more wide ranging recommendations for future coring programmes.
- 5.5 Whilst the lead authorities used a single contract style, which helped reduce inconsistencies previously encountered, it is recommended that a single contract be used for the whole of Scotland. This would require only one lead organisation or the appointment of a consultant to undertake this role.
- 5.6 A “Coring Workshop”, or sessions, (as previously advised in previous reports) be organised prior to any future programmes to assist those involved to acquire the required skills and knowledge to carry out a successful Coring Programme. This would be for both roads authorities and undertakers.
- 5.7 The RAUC(S) National Coring Working Group consider updating the future Advice Note 3 to describe how Local Coring should take place, bringing it in line with National Coring.
- 5.8 RAUC(S) co-chairs release a press statement on behalf of the community.

APPENDIX NC1 NUMBERS OF PASS/FAIL BY AUTHORITY

	No. Cores	Pass	Fail	Pass %
NoS RAUC	280	257	23	92%
TayForth RAUC	307	276	31	90%
WoS RAUC	340	324	16	95%
SE RAUC	388	340	48	88%
SW RAUC	434	372	62	86%
Transport Scotland	15	15	0	100%
Total	1764	1584	180	90%

Table A1.1 – Numbers of Pass/Fail by RAUC Area and Overall

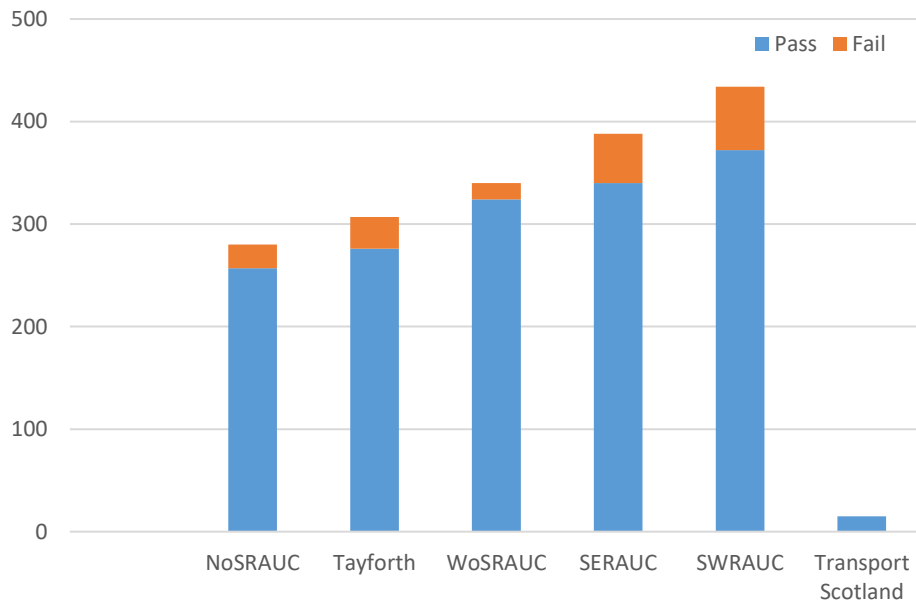


Figure A1.1 - Numbers of Pass/Fail by RAUC Area and Overall

	No. Cores	Pass	Fail	Pass %
Aberdeen City Council	94	84	10	89%
Aberdeenshire Council	50	49	1	98%
Angus Council	0	0	0	N/A
Argyll & Bute Council	38	35	3	92%
City of Edinburgh Council	214	185	29	86%
Clackmannanshire Council	30	30	0	100%
Comhairle nan Eilean Siar	20	18	2	90%
Dumfries & Galloway Council	50	48	2	96%
Dundee City Council	73	65	8	89%
East Ayrshire Council	38	34	4	89%
East Dunbartonshire Council	43	32	11	74%
East Lothian Council	35	33	2	94%
East Renfrewshire Council	32	31	1	97%
Falkirk Council	39	35	4	90%
Fife Council	97	92	5	95%
Glasgow City Council	161	153	8	95%
Highland Council	83	73	10	88%
Inverclyde Council	27	25	2	93%
Midlothian Council	33	33	0	100%
Moray Council	33	33	0	100%
North Ayrshire Council	43	35	8	81%
North Lanarkshire Council	102	89	13	87%
Perth & Kinross Council	35	25	10	71%
Renfrewshire Council	56	54	2	96%
Scottish Borders Council	40	33	7	83%
South Ayrshire Council	43	39	4	91%
South Lanarkshire Council	115	95	20	83%
Stirling Council	33	29	4	88%
Transport Scotland	15	15	0	100%
West Dunbartonshire Council	26	26	0	100%
West Lothian Council	66	56	10	85%
Total	1764	1584	180	90%

Table A1.2 – Numbers of Passes and Fails by Roads Authority

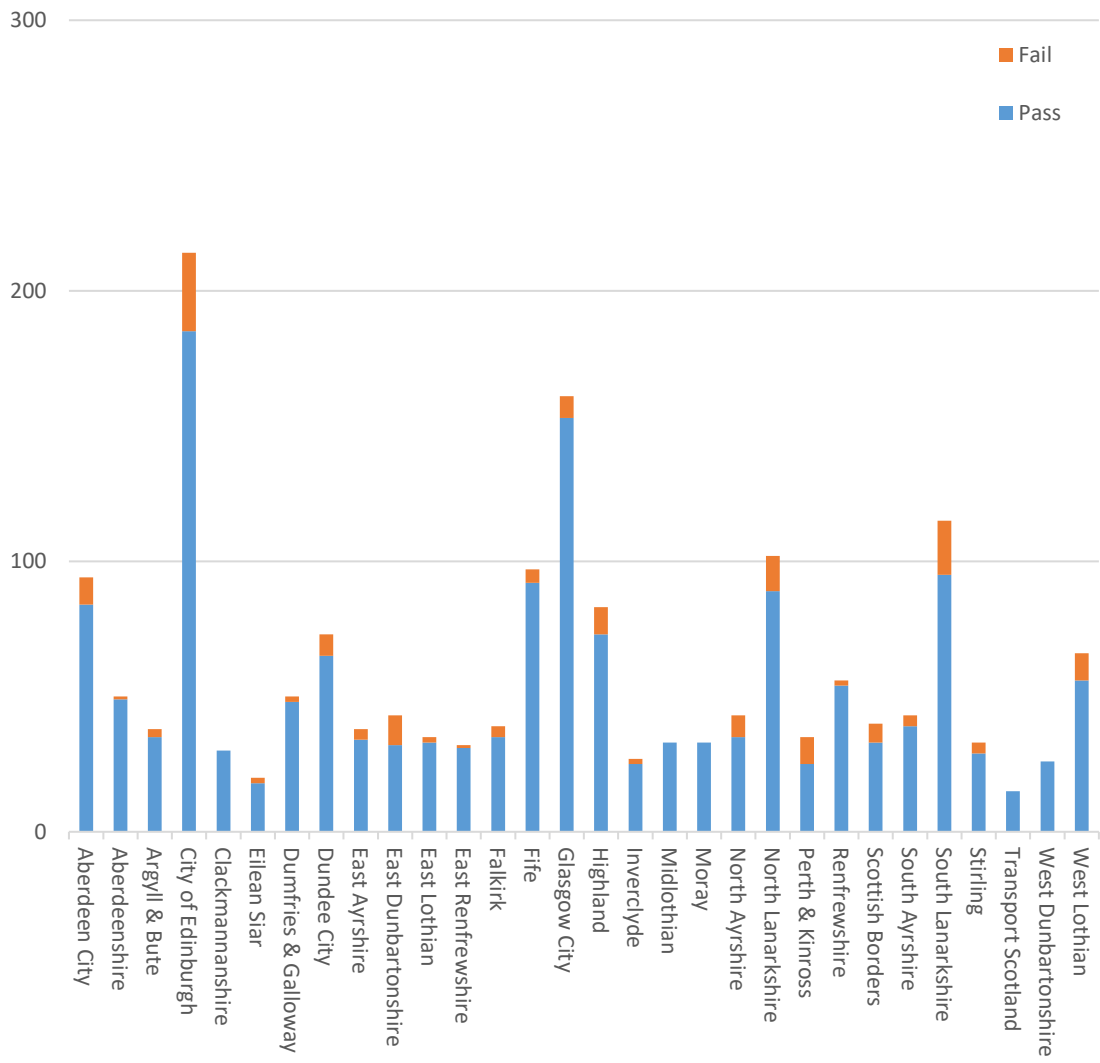


Figure A1.2 – Passes and Fails by Roads Authority

APPENDIX NC2 NUMBERS FOR PASS/FAIL BY UTILITY

	No. Cores	Pass	Fail	Pass %
BT	371	330	41	89%
CityFibre	237	204	33	86%
Commsworld Limited	10	8	2	80%
Energy Assets Pipelines	10	10	0	100%
GTC Pipelines Limited	17	17	0	100%
Last Mile Electricity Limited	30	21	9	70%
Last Mile Gas Limited	13	12	1	92%
mua Electricity Limited	10	6	4	60%
Neos Networks	15	6	9	40%
Scottish Hydro Electric Power Dis.	50	40	10	80%
Scottish Water	437	422	15	97%
SGN	202	193	9	96%
SPEN	194	178	16	92%
Virgin Media	154	127	27	82%
Vodafone	14	10	4	71%
Total	1764	1584	180	90%

Table A2.1 – Numbers for Pass/Fail by Utility Sampled

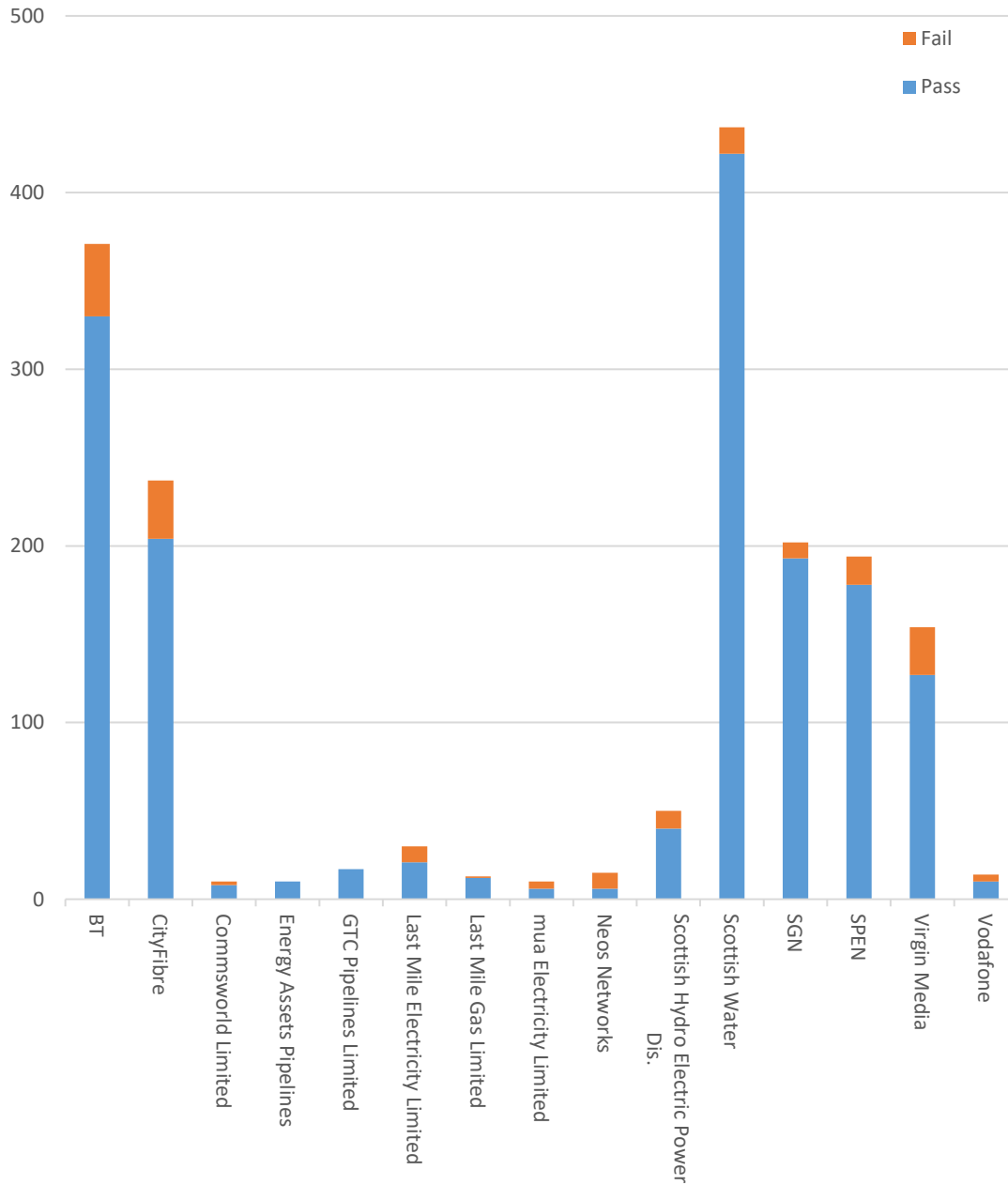


Figure A2.1 – Failure Type Numbers by Utility

APPENDIX NC3 CORE FAILURE ANALYSIS

Cores	Pass	Fail	Pass %
1764	1584	180	90%

Table A3.1 – Total Failures Across All Areas

Reason for Failure	Fail	%
Voiding	27	14%
Layers	104	54%
Materials	42	22%
Other	20	10%
Total Failures*	193	100%

Table A3.2 –Reasons for Failure Across All Areas

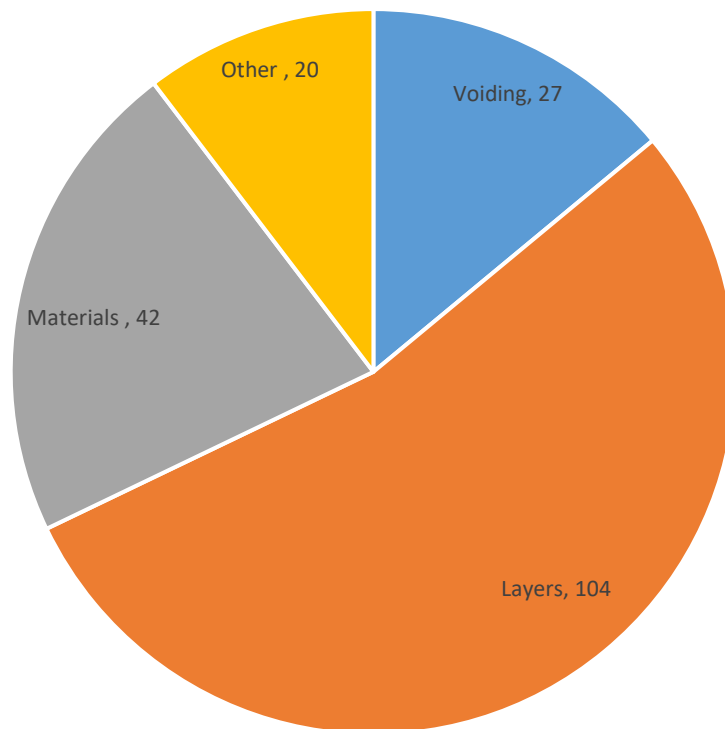


Figure A3.1 – Reasons for failure

*Please Note: The total number of failures adds up to more than 100% of failed cores i.e. there are 193 failures from 180 failed cores. This is because some cores had more than 1 failure each and records need to be taken for all to make worthwhile analysis of the issues.

NoS RAUC Area

Cores	Pass	Fail	Pass %
280	257	23	92%

Table A3.3 – Total Failures in NoS RAUC Area

Reason for Failure	Fail	%
Voiding	1	4%
Layers	18	69%
Materials	3	12%
Other	4	15%
Total	26	100%

Table A3.4 - Reasons for Failure in NoS RAUC Area

SE RAUC Area

Cores	Pass	Fail	Pass %
388	340	48	88%

Table A3.9 – Total Failures in SE RAUC Area

Reason for Failure	Fail	%
Voiding	4	8%
Layers	31	63%
Materials	11	22%
Other	3	6%
Total	49	100%

Table A3.10 - Reasons for Failure in SE RAUC Area

TayForth RAUC Area

Cores	Pass	Fail	Pass %
307	276	31	90%

Table A3.5 – Total Failures in TayForth RAUC Area

Reason for Failure	Fail	%
Voiding	8	26%
Layers	20	65%
Materials	0	0%
Other	3	10%
Total	31	100%

Table A3.6 - Reasons for Failure in TayForth RAUC Area

WoS RAUC Area

Cores	Pass	Fail	Pass %
340	324	16	95%

Table A3.11 – Total Failures in WoS RAUC Area

Reason for Failure	Fail	%
Voiding	1	5%
Layers	7	37%
Materials	7	37%
Other	4	21%
Total	19	100%

Table A3.12 - Reasons for Failure in WoS RAUC Area

SW RAUC Area

Cores	Pass	Fail	Pass %
434	372	62	86

Table A3.7 – Total Failures in SW RAUC Area

Reason for Failure	Fail	%
Voiding	13	19%
Layers	28	42%
Materials	21	31%
Other	6	9%
Total	68	100%

Table A3.8 - Reasons for Failure in SW RAUC Area

Transport Scotland

Cores	Pass	Fail	Pass %
15	15	0	100%

Table A3.13 – Total Failures in TS Roads

Reason for Failure	Fail	%
Voiding	0	N/A
Layers	0	N/A
Materials	0	N/A
Other	0	N/A
Total	0	N/A

Table A3.14 - Reasons for Failure in TS Roads

APPENDIX NC4 UTILITY SECTOR ANALYSIS

	No. Cores	Pass	Fail	Pass %	Sector
BT	371	330	41	89%	Telecoms
CityFibre	237	204	33	86%	Telecoms
Commsworld Limited	10	8	2	80%	Telecoms
Energy Assets Pipelines	10	10	0	100%	Gas
GTC Pipelines Limited	17	17	0	100%	Gas
Last Mile Electricity Limited	30	21	9	70%	Electricity
Last Mile Gas Limited	13	12	1	92%	Gas
mua Electricity Limited	10	6	4	60%	Electricity
Neos Networks	15	6	9	40%	Telecoms
Scottish Hydro Electric Power Dis.	50	40	10	80%	Electricity
Scottish Water	437	422	15	97%	Water
SGN	202	193	9	96%	Gas
SPEN	194	178	16	92%	Electricity
Virgin Media	154	127	27	82%	Telecoms
Vodafone	14	10	4	71%	Telecoms

Table A4.1 - Undertaker Percentage Pass Rate Scotland Wide

Sector	Cores	Pass	Fail	Pass %
Gas	242	232	10	96%
Electricity	284	245	39	86%
Telecoms	801	685	116	86%
Water	437	422	15	97%

Table A4.2 - Utility Sector Analysis