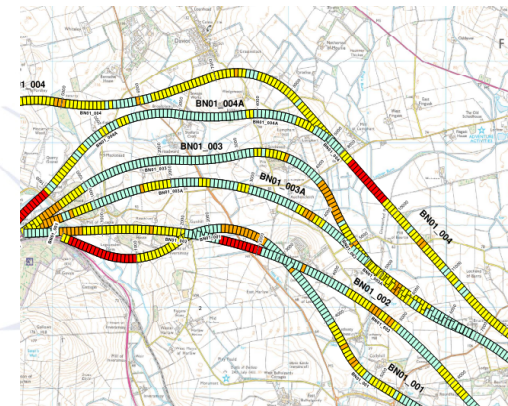


Appraisal Process - Engineering



- Alignment team generate sectional Plan & Profiles
- Input section alignments into GIS
- Engineering sub-disciplines carry out appraisal of sections (50m interval) based on engineering metrics and applying 7pt scale:
 - Alignment standards compliance – use of relaxations and departures (new discipline appraisal)
 - Level difference – degree to which alignment follows topography and requires large earthworks (as first fix)
 - Geotechnics – Feasibility / complexity of required geotechnical works for local ground conditions (as first fix)
 - Structures – Feasibility / complexity of structures required (as first fix)
 - Drainage and Hydrology - Flood Plain, Watercourse Crossings, and Attenuation Requirement. (as first fix)
 - Utilities impact (as first fix)

-3	Major Adverse
-2	Moderate Adverse
-1	Slight Adverse
0	Neutral



Appraisal Metrics - Engineering

Red Sifting Criteria Examples



- Alignment – Not compliant with Standard
- Earthworks/Level Difference – Not following existing ground i.e. level diff over 20m in height
- Geotechnics – Embankments
 20m+ on Glacial Till or rock
 15m+ on compressible soils (Cat 2)
 5m+ on peat/compressible (Cat 1)
- Cuttings
 25m+ in Glacial Till / 20m+ in rock
 15m+ in compressible soils (Cat 2)
 5m+ in peat/ in compressible (Cat 1) /Any cut in landfill
- Structures – Very large span (300 m+) and/or complex structure e.g. tunnels and major viaducts, extremely complex maintenance requirements or demolition, onerous third-party requirements, major adverse H&S hazards
- Flooding & Drainage – Likely adverse impact upon active flood plain, significant abnormal works or problematic provision of drainage attenuation
- Utilities – Impact on Strategic Utility Infrastructure or multiple impacts on Regional Utility Infrastructure

Appraisal Process - Engineering

- Collation of sub-discipline sectional appraisals into engineering sectional spreadsheet
- Collated scores checked and reviewed (moderation)
- The cumulative score is a number from 0 to -18
- A sub-discipline major score (-3, red) is important enough to warrant a summary major score, taking preference over the cumulative scoring
- Generation of 52 end to end spreadsheets by combining sectional spreadsheets – check and review undertaken
- Transfer of end to end spreadsheet to GIS – graphical representation of results



-9 or lower	Major Adverse
-6,-7,-8	Moderate Adverse
-3,-4,-5	Slight Adverse
0,-1,-2	Neutral

Appraisal Process - Engineering

- To complete the engineering assessment, analysis of the number and type of impacts identified focused on:
 - number of Major Adverse Scores,
 - number of Major Adverse Score Clusters
 - number of Moderate Adverse Scores
 - number of Moderate Adverse Score Clusters
- Adverse scores indicate the number of 50m segments that attract a major, moderate or minor score
- Score Cluster is defined as a group of consecutive instances of the same score.
- Number of major clusters for each end to end alignment are summed up to group the alignments from 1-52 (least number – better performing, larger number – poorer performing)
- Where there are a similar number of major impacts, the number of moderate clusters determine position of alignment in 1-52 table.



-3	<ul style="list-style-type: none">• number of Major Adverse Scores: 5• number of Major Adverse Score Clusters: 2• number of Moderate Adverse Scores: 3• number of Moderate Adverse Score Clusters: 2
-3	
-3	
-2	
0	
-2	
-2	
-3	
-3	
-3	





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Engineering Worked Example – Alignment 22



2nd Fix Engineering Assessment process Example Alignment 22



- Sectional plan & profiles created - OLN Online – OLC Online – BN01 Inner - OLS
- Alignment sections input into GIS
- Sub-discipline appraisal carried out and results collated in sectional spreadsheet
- Generation of end to end spreadsheet
- End to end Results displayed and stored in GIS
- Examples of major and moderate impacts
- Scoring and results for Alignment 22

Appraisal Process - Environmental



- Nine disciplines – air quality, noise & vibration, ecology, cultural heritage, landscape & visual, water environment, planning & policy, geology & soils, people & communities
- Two outputs per discipline:
 - colour coded spreadsheet of appraisal for each 50m segment of the alignment section
 - commentary text to justify appraisal
- Overall environmental score/colour mapped on GIS for each 50m segment based on:
 - Where any discipline identified a major impact, the overall impact was major
 - Where any discipline identified a moderate impact, and there were no major impacts the overall impact was moderate
 - Where any discipline identified a minor impact, and there were no major or moderate impacts the overall impact was minor.

Appraisal Process - Environmental



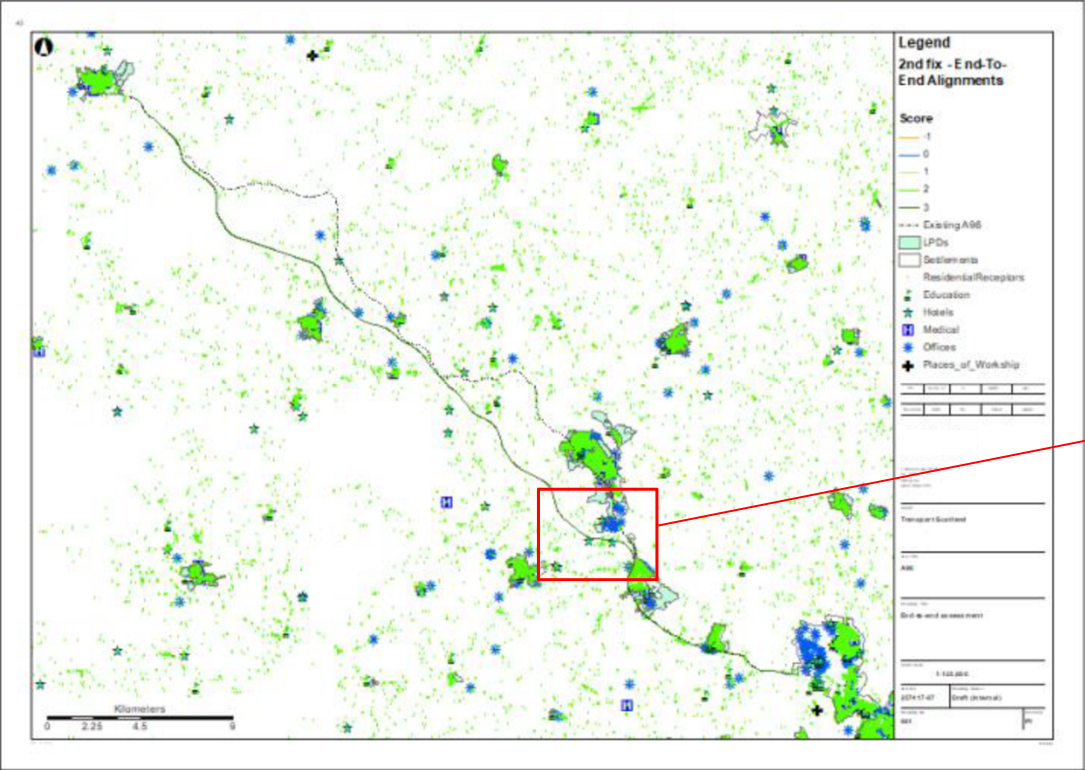
2nd fix appraisal – cultural heritage commentary for each section

BN01 inner	Scheduled Monuments (SMs)	Category A Listed Buildings	Inventory Gardens and Designed Landscapes (GDLs)	Inventory Historic Battlefields	Category B Listed Buildings	Conservation Areas	Properties in Care
	<p>There are no Scheduled Monuments within the alignment.</p> <p>There are 22 SM within 2km of the alignment.</p> <p>Ratch-hill, settlement, field system & enclosures (SM6448) is situated within an area of rough pasture with a number of trees present. The alignment would lie c.1.1km to the east of the SM, and would not have a significant impact on its setting, not least as it follows the line of the existing A96 where it runs closest to the SM.</p> <p>Caskieben moat, moated site and symbol stone 170m N of Keith Hall (SM75) is located within the Keith Hall GDL. Its setting is not considered likely to be significantly impacted by the alignment.</p> <p>Stoneyhill, cairn 195m WSE of (SM12343) is situated c. 1.4km to the</p>	<p>There are no Category A LB within the alignment.</p> <p>There are four Category A LBs within 2km of the alignment.</p> <p>Bourtie House (LB2819) is located c. 0.5km to the north of the alignment. It is set within a non-designated GDL and surrounded by mature woodland which provides a localised setting. Key views are to the south. The alignment may have an impact on its setting.</p> <p>Keith Hall (LB9136) is located 1.6km to the south-west of the alignment. Its setting is within the Keith Hall GDL, and the house has a key view to the south; topography means that the alignment would be hidden in views to the south.</p> <p>Balbithan House (LB9140) lies c.0.7km to the south-east of the alignment. The house is accessed by a</p>	<p>The alignment intersects with the north-easternmost corner of Keith Hall Inventory GDL, and would have a direct impact on the GDL.</p> <p>Keith Hall Inventory GDL had views out from across its parkland, with many views westwards towards the River Urie and the town of Inverurie. An avenue dating from the 17th century leads south from the house, and forms a key view. None of these key views would be affected by the alignment. The alignment would run very close to the eastern edge of the GDL, and would introduce a new feature into what is currently a rural landscape. This may adversely affect the setting of the GDL.</p> <p>There are no other Inventory GDL within 2km of the alignment.</p>	<p>The alignment does not intersect with any Inventory Historic Battlefields.</p> <p>There are two Inventory Historic Battlefields within 2km of the alignment.</p> <p>Battle of Harlaw (BT111) lies to the immediate west of the northern end of the alignment. The proximity of the route to the battlefield means a significant impact on the battlefields setting is likely.</p> <p>Battle of Barra (BT118) is located c. 1.7km to the northeast of the alignment. The main area of fighting is believed to have taken place to the northwest of the Hill of Barra. The hill would have provided, and continues to provide an excellent elevated location from which to view the wider battlefield landscape. The alignment may affect the setting of the battlefield, but it is considered</p>	<p>There are no Category B LB within the alignment.</p> <p>There are 24 Category B LB within 2km of the alignment.</p> <p>Garden Cottage, Bourtie House (LB2820) is set within the non-inventory GDL associated with Bourtie House. The alignment would not have a significant impact on its setting.</p> <p>Harlaw Monument (LB2831) is situated at the approximate location of the Battle of Harlaw, and within the Harlaw Inventory Historic Battlefield. The ability to understand the battlefield landscape from the monument forms part of its setting. The alignment lies in very close proximity to the eastern edge of the battlefield and is likely to affect its setting, and that of the monument.</p> <p>East Balhagardy Cottar Houses (LB2832) are</p>	<p>The alignment does not intersect with any CAs.</p> <p>There are no CAs within 2km of the alignment.</p>	<p>There are no PICs within the alignment.</p> <p>There are two PIC within km of the alignment.</p> <p>Brandsbutt Stone (PIC229) has a localised setting within area of housing at the northern side of Inverurie. Its setting would not be impacted by the alignment.</p> <p>Kinkell Church (PIC251) is located c. 1.3km to the north-east of the alignment. Its setting is not considered to be vulnerable to effects on its setting due to this use of this alignment.</p>

The screenshot shows a detailed appraisal table with the following columns: Name, Start, End, Category, IMPACT, Culture, Conservation, Culture, Heritage, Ref, and P.I.C. The table lists numerous sites and their impact assessments, including entries for 'BN01 Inner', 'BN01 Outer', and 'BS01'.

Appraisal Process - Environmental

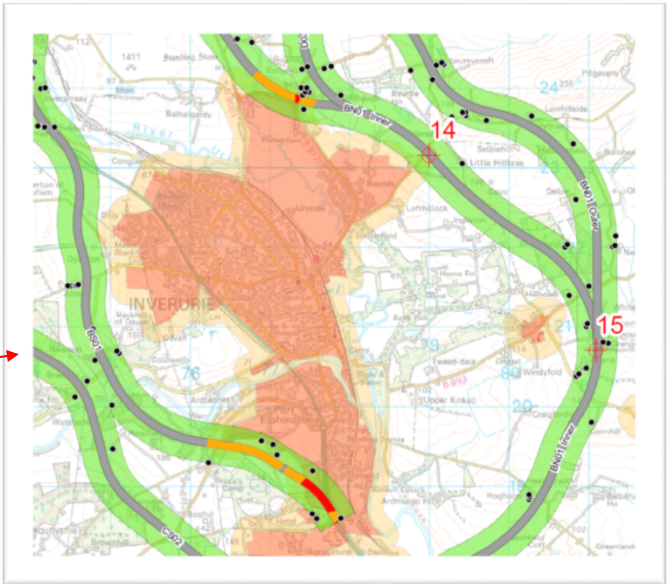
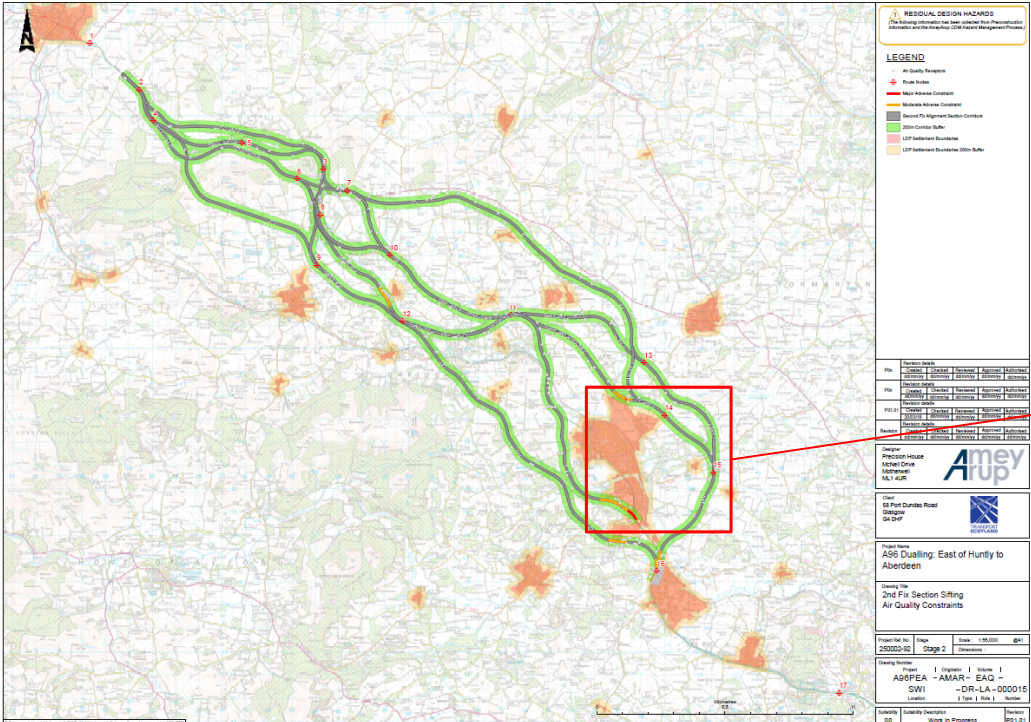
Noise & Vibration



Appraisal Process - Environmental



Air Quality

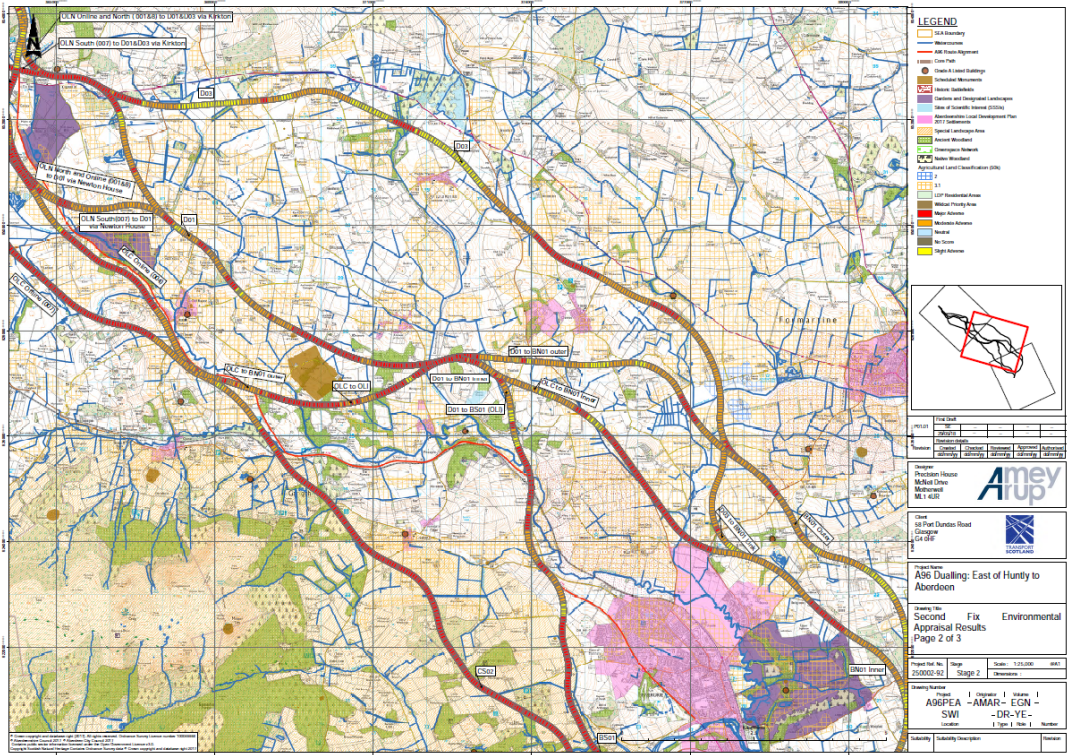


Appraisal Process - Environmental



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC
1		END TO END	Chai			SECTIONS	Chai			Cross Check																			
2		Alignment_22	Start Chai	End Chai			Start Chai	End Chai		Section	Start Chai	Comment		Landscape and visual	Water	Ecology	People and community	Noise	Air quality	Cultural heritage	Plans and policies	Soil and geology	Other	Other	Other		Total Score	Moderated score	Comments
3		Alignment_22	22500	22550		OLC-BIN	2100	2150		OLC-BIN	2100	OK		-1	0	0	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
454		Alignment_22	22550	22600		OLC-BIN	2150	2200		OLC-BIN	2150	OK		-1	0	0	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
455		Alignment_22	22600	22650		OLC-BIN	2200	2250		OLC-BIN	2200	OK		-1	0	0	-2	0	0	0	0	0	0	0	0	0	-3	0	0
456		Alignment_22	22650	22700		OLC-BIN	2250	2300		OLC-BIN	2250	OK		-1	0	0	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
457		Alignment_22	22700	22750		OLC-BIN	2300	2350		OLC-BIN	2300	OK		-1	0	0	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
458		Alignment_22	22750	22800		OLC-BIN	2350	2400		OLC-BIN	2350	OK		-1	0	0	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
459		Alignment_22	22800	22850		OLC-BIN	2400	2450		OLC-BIN	2400	OK		-3	0	-2	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
460		Alignment_22	22850	22900		OLC-BIN	2450	2500		OLC-BIN	2450	OK		-3	-3	-2	-2	0	0	0	0	-2	0	0	0	0	-3	0	0
461		Alignment_22	22900	22950		OLC-BIN	2500	2550		OLC-BIN	2500	OK		-3	-3	-2	-1	0	0	0	0	0	0	0	0	0	-3	0	0
462		Alignment_22	22950	23000		OLC-BIN	2550	2600		OLC-BIN	2550	OK		-3	-3	-2	-1	0	0	0	0	0	0	0	0	0	-3	0	0
463		Alignment_22	23000	23050		OLC-BIN	2600	2650		OLC-BIN	2600	OK		-3	0	-2	-1	0	0	0	0	0	0	0	0	0	-3	0	0
464		Alignment_22	23050	23100		OLC-BIN	2650	2700		OLC-BIN	2650	OK		-3	0	-2	-1	0	0	0	0	0	0	0	0	0	-3	0	0
465		Alignment_22	23100	23150		OLC-BIN	2700	2750		OLC-BIN	2700	OK		-3	0	-2	-1	0	0	0	0	0	0	0	0	0	-3	0	0
466		Alignment_22	23150	23200		OLC-BIN	2750	2800		OLC-BIN	2750	OK		-3	0	-2	-2	0	0	0	0	0	0	0	0	0	-3	0	0
467		Alignment_22	23200	23250		OLC-BIN	2800	2850		OLC-BIN	2800	OK		-3	0	-2	-2	0	0	0	0	0	0	0	0	0	-3	0	0

Appraisal Process - Environmental



- 7 point scale end-to-end environmental appraisal summary on GIS output
- Constraints map background



Appraisal Process - Environmental

- A mark for each end-to-end alignment was obtained by taking the sum of the total score for all 50m segments in each alignment.
- These marks were then used to group the end to end alignments from better to poorer performing.



	A	B	C	D
	Alignment	Total Score	Proposed road length (km)	
1				
2	Alignment_21	-1600	39.036	
3	Alignment_67	-1612	39.479	
4	Alignment_20	-1631	39.195	
5	Alignment_93	-1642	39.21	
6	Alignment_66	-1645	39.704	
7	Alignment_10	-1662	33.299	
8	Alignment_58	-1676	33.796	
9	Alignment_92	-1677	39.435	
10	Alignment_191	-1689	39.069	
11	Alignment_190	-1700	34.204	
12	Alignment_185	-1702	33.627	
13	Alignment_60	-1703	39.569	
14	Alignment_89	-1708	33.53	
15	Alignment_196	-1720	34.703	
16	Alignment_187	-1729	39.4	
17	Alignment_188	-1729	39.977	
18	Alignment_173	-1735	39.303	
19	Alignment_194	-1749	40.476	



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Environmental Worked Example – Alignment 22

