

Cessnock City Council Roads Program Audit Compliance Review and Recommendations

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WATER | ENERGY & RESOURCES | ENVIRONMENT | PROPERTY & BUILDINGS | TRANSPORTATION

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1. Introduction

The Cessnock Local Government Area (LGA) covers approximately 1,950 square kilometres within the Hunter Valley of New South Wales, approximately 120 kilometres north of Sydney and 40 kilometres west of Newcastle. The population of the LGA is approximately 52,000 and the city has common borders with Singleton, Lake Macquarie, Newcastle, Maitland and Wyong local government areas.

Cessnock and the majority of its surrounding townships have a long history as coal mining communities. While mining has progressively moved further up the Hunter Valley over the last forty years the area remains steeped in the mining history and culture, with many residents travelling by road to and from work each day in the Upper Hunter mining areas in Singleton and Muswellbrook.

The Cessnock area has also traditionally been a major viticultural region and it is this industry which is the major economic driver for the city in current times. Together with wine production, tourism is the key growth industry in Cessnock. This brings in many thousands of visitors to the region on an annual basis, primarily by road transport from elsewhere in NSW.

As part of its commitment to progressively improve its organisational and financial performance, Cessnock City Council (Council) has resolved to review its management of the road network, focussing on strategic asset management and quality based processes for road design, construction and management.

Previous reviews of road network management practices have identified deficiencies in road network planning and construction which Council and its staff have acknowledged. A series of road project and roads program audits and reports over recent years have highlighted these deficiencies and have resulted in an ongoing improvement and implementation plan which is to be periodically audited.

GHD was engaged by Council in May 2013 to undertake the Roads Program Audit (also referred to as the program audit). This program audit report confirms our methodology and approach to the review of a number of recent and current roads projects and outlines our findings in relation to documentation provided.

1.1 Road network management

Council has 1040km of road network within its very large LGA. It is broken up into three classifications as follows:

- State Roads which are responsibility of the Roads and Maritime Services (RMS).
- Regional Roads which are funded by RMS but are the responsibility of Council.
- Local Roads which are funded and managed by Council.

Of this total length of road, 710 km are sealed and 330 km are unsealed. The asset management over this network of roads is a major undertaking for the Council, with a majority of roads and bridges being very old, constructed during the earlier development of the region when traffic volumes were very much lower than they are at present.

As a result, there is pressure to utilise available asset management funding as efficiently as possible but this requires prudent resource allocation, practical design documentation and industry standard road construction and maintenance practices.

Council in the past been criticised for having a poor record in constructing and maintaining roads to an appropriate standard, with some instances of road failures within a few months of construction.

Although it is expected that improvements have been made with better project management, design documentation and construction methodologies, Council requires an ongoing annual review of its processes and quality assurance systems. This roads program audit has included a review of the proposed implementation plan from previous audits and reviews undertaken by specialist local government consulting firm Morrison Low.

1.2 Cessnock Council roads program

The Cessnock Council roads program is a multi-million dollar commitment by the elected representatives of the city to road network maintenance, improvement and new construction. Funds are provided from Council and State Government sources and are managed by Council staff. There are two programs where the roads expenditure is budgeted and expended as follows:

- **Capital construction works program** are works which include the construction of new or additional infrastructure, or the significant upgrade of existing infrastructure.
- **Capital renewal works program** are works which include the renewal or asset replacement (like for like) of existing infrastructure.

The combined budget for these two programs in 2012 – 2013 is approximately \$20M, broken down as follows. Note that programs as marked (**) are not subject to the roads program audit.

Programme	Component	2012 – 2013 Budget
Capital construction works program		Approximately \$12,000,000
	Local Roads construction program	\$3,504,130
	Regional Roads Construction Program	\$1,010,003
	Vineyard Roads Construction Program	\$5,000,000
	Pathways Construction Program **	\$56,000
	Bridges Construction Program	\$1,790,000
	Drainage Construction Program	\$778,667
	Other Community and Recreation Facilities Construction **	\$884,800
Capital renewal works program		Approximately \$8,000,000
	Local Roads Renewal Program	\$2,810,765
	Regional Roads Renewal Program	\$4,892,908
	Other Community and Recreation Facilities Renewal **	\$334,000

Clearly this is a major undertaking by Council and one that requires best practice management and implementation. While previous reviews of the roads program management have been critical of past performance, anecdotal evidence from GHD involvement in the response and preparation of tender submissions is that substantial improvements have been made.

1.3 Audit objectives

There a number of objectives of the Roads Program Audit that have been prescribed by Council as follows:

- To ensure that standard construction techniques are used and that quality control is being undertaken during and on completion of works.
- To ensure that progress has been made against previous reports to ensure that project management practices are being followed.
- That there are appropriate project management practices in place from the initial project brief to the completion of works
- To provide best practice outcomes for this community and a further implementation plan, if necessary, on any additional options for improvement on the quality of road construction undertaken.

These objectives have been included throughout the project reviews and are referenced in the conclusions and recommendations section of this report.

2. Scope of audit and project reviews

The roads program audit has been undertaken on the requirements set out in Council's project brief - that the audit would investigate, as a minimum, various aspects of road network planning and construction management as follows:

- Review the outcomes from the previous audits (SMEC and Morrison Low) and check progress against the implementation plan.
- That appropriate project management standards are being followed and adhered to.
- That the final design and construction drawings and specification are appropriate in terms of the expected life and use of the pavement.
- For any brief, design, drawing and/or specification work that has been undertaken by engineering consultants, ensure that they included appropriate geotechnical testing and design requirements and the final deliverables from the consultancies are signed off under the appropriate delegations.
- Check that any in-house design work undertaken for any bridge or other structure has been peer reviewed by a reputable engineering consultancy and signed off under delegation.
- Ensure that the roads audited have been constructed according to the approved design and that they meet Australian Standards for construction quality.

In addition to these aspects GHD also nominated in its project proposal to review a number of related aspects, where relevant documentation is available, for each of the selected projects, as follows:

- Design brief and project objectives.
- Design documentation – calculations, drawings and reports, including independent verification where required.
- Quantity schedules and cost estimates where provided.
- Evidence of construction planning and design interface activities.
- Construction techniques and levels of monitoring and surveillance.
- Materials quality and specification conformance.
- Completion of construction records and quality assurance documentation.

Given that there was limited construction activity underway when the audit was commenced, a number of retrospective inspections were undertaken on projects which have been constructed in the last few years. This was to establish if improved documentation has realised better asset performance.

These inspections were based on pavement surface features only, with photographs supplied as part of documentation handover. There were no quantitative surveys undertaken to establish construction quality or in-service pavement behaviour.

3. Previous audit reports

A number of previous road project audits and organisation review reports have been supplied by Council as part of our commission. The first objective of the program audit is to review the outcomes from the previous audits (SMEC and Morrison Low) and check progress against the subsequent implementation plan prepared by Morrison Low.

This section provides a synopsis of these previous audits, organisational reviews and the implementation plan prepared. Reference to these reports is not intended to reiterate any explicit or implicit criticisms of Council staff in these reports, rather to establish a baseline from which expected improvements will emerge.

3.1 SMEC report and audit (February 2011)

SMEC was engaged by Council in 2010 to undertake an audit of its road design and road construction activities. A summary of the SMEC findings is provided as follows:

Design and construction documentation review

- Documentation indicates that designs are carried out in general accordance with relevant standards.
- However, the project documentation does not indicate any evidence of geotechnical investigations being undertaken prior to the design stage of projects.
- Results of such investigations should normally be considered in the design of pavement structures.
- The documentation also shows no evidence of structured design and safety review processes, from which the Council would benefit in terms of clear assessment of design deficiencies and decisions.
- SMEC recommended that Construction Risk Assessment and Safety in Design Workshops be undertaken with the involvement of Council designers and construction personnel.
- It was further recommended that more design details to be included in drawings so that construction teams will not be forced to make design decisions in the field.

Pavement design and material selection review

- The project documentation does not indicate any pavement design procedure is being used, as there are design basis, such as traffic loading or CBR testing, shown in any of the documentation reviewed.
- The designs provided lack specification on material types and adequate definition of the properties or grading of proposed pavement materials.
- The documentation also does not indicate adequate details of subsoil drains to ensure the proper functioning throughout the pavement design life.
- Generally the pavement designs appear to be based on past experience and not on normal use of pavement design best practices.

Construction procedures review

- The IMS which is utilised effectively for setting up projects is also used in the management of project construction. However, there is poor feedback of the project performance into the system for costs or program and hence the assessment of work is done using a non-scientific judgement process.

- Material testing is lacking and this is reflected in the inconsistent approach to pavement construction.
- A more structured approach needs to be implemented by Council for the OHS management of construction teams. This has been highlighted by the generic nature of WMS and including the lack of detail for machinery spotters, and work in remote locations.
- SMEC recommended a review the role of external contractor teams in the area, consideration of electronic recording of site information for feedback into the IMS, development of a quality controlled approach to all construction processes but particularly pavement construction, and improved emphasis on OHS management in construction process by specific WMS and assessment of project dangers.

There were three projects on which the Council provided design documentation for SMEC to base its reviews on. The roads audited were:

- Quarrybylong Street
- Broke Road
- Paynes Crossing Road

In addition to the range of review outcomes and recommendations identified above the SMEC audit emphasised two observations of unprofessional practice or omissions which are severely detrimental to planning, design and construction of road projects. These observations were as follows:

- There appears to be no pre-design geotechnical testing undertaken for all three sample roads. We can assume that this is standard practice and has been for some time.
- In all three audits there was no evidence that pavement design had been undertaken which again, can be assumed to be standard practice.

These matters were subsequently highlighted in quite forceful terms by Morrison Low in its references to the SMEC report.

3.2 Morrison Low (February 2011)

The first Morrison Low report was titled *Review of Roads Section and Audit Results for General Manager* and was a follow up to the SMEC report. The two reports are coincident in their respective final dates but this is believed to be as a result of delays in finalisation. There are key references in this Morrison Low report to the SMEC report being complete.

The Morrison Low report reinforced the findings of the SMEC report, in particular highlighting identified deficiencies in design and construction practices and procedures. In addition to reviewing the outcomes and findings of the SMEC report, Morrison Low also undertook:

- A review of road maintenance practices.
- A review of Council's road sealing contract and its management.
- A retrospective analysis of a pavement failure on Majors Lane on recently completed construction back in 2008.

With guidance from Morrison Low, senior management at Council developed an Implementation Plan to ensure that all urgent matters were addressed and that specific SMEC recommendations had been recorded and actioned.

This implementation was developed in a format that would allow the General Manager to monitor progress and performance and it was recommended that this be audited in an annual basis.

3.3 Morrison Low (2012)

Morrison Low was subsequently engaged by Council's Group Leader Community Services to carry out a range of organisational and program reviews in relation to roads asset management and Council's works delivery unit. This involved a three tier approach as follows:

- To review the draft Asset Management Policy, Strategy and Plans, in particular the Road Network Asset Management Plan via a workshop with Community Services and Strategy and Sustainability staff
- To provide advice on the proposed restructuring of the Works Delivery unit
- To prepare a report to Council describing the changes to the roads program that will flow out of the finalised Roads Asset Management Plan

Each of these points resulted in a separate report from Morrison Low. While these reports are not referenced in detail in this audit report it is relevant to note that the emphasis for roads program expenditure to progressively move from new construction to renewal of existing assets emanated from these reviews and reports.

3.4 Morrison Low implementation plan

The Morrison Low implementation plan is being progressively actioned and monitored by both the Design Delivery section and the Works Delivery section.

Commentary on the progress of the implementation plan is provided in Appendix E. This takes the form of an additional column in the landscape table for a GHD / RPA comment on the advised current status of the various action items.

4. Roads program audit

The roads program audit undertaken by GHD included a multi-faceted review of Council's road design, structural design and road construction practices. However, the scope of the audit and the number of projects chosen for review do limit the depth to which the audit can delve.

Notwithstanding, the audit team consisting of roads professionals with respective long RTA / RMS and construction contractor experience, was able to review all of the supplied documentation. This was to confirm that revised practices are in place and that there is sufficient demonstration of construction outcomes to be confident in improved performance.

4.1 Meetings and liaison with Council staff

GHD has undertaken a typical audit process which included a formal start up meeting on commencement, review of a range of project documentation and a close out meeting during the preparation and delivery of the final report.

In addition there have been other informal meetings, most notably during the review and collection of Council design and construction records and during field visits to recent and current construction sites. GHD thanks all Council staff members for their respective assistance with and contribution to the audit process.

Details of these meetings are provided in the table below – this documents the date and purpose of the meeting and participation from each organisation.

Meeting	Date	Purpose	Attendees
Inception / Start up meeting	23 May 2013	Commence audit process and confirm Council requirements.	CCC – NB / KK / WC GHD – BH / PY / GM
Documentation review of selected projects	1 July 2013	Review design delivery and works delivery records.	CCC – NB GHD – BH
Documentation clarification	1 July 2013	Confirm content and format of records provided.	CCC – GB / KK / JL GHD – BH
Site visit / worksite inspection	4 July 2013	Review previously completed construction projects.	CCC – GB GHD – GM
Site visit / worksite inspection	12 July 2013	Inspect road construction in progress.	CCC – BC GHD – GM
Draft report review	24 July 2013	Review preliminary findings and report recommendations.	CCC – NB / WC GHD – BH
Close out meeting	31 July 2013	Presentation of draft report and discussions.	CCC – NB / WC GHD – BH / GW

Notes:

1. Formal notes from the Start up and Close out meetings have been provided in Appendix A.
2. No formal record of the documentation review and clarification meeting was maintained.
3. The draft report review meeting was recorded as a Track Changes version of the Draft Report
4. Details of the field inspection meetings and associated notes are provided in Appendix D. A selection of photographs taken on site is included in these field inspection notes. All photographs taken will be issued to Council with the Final Report documentation.

As requested by Council, all contact between the audit team and Council staff has been through the nominated audit manager, who has managed all of the relevant input documentation.

4.2 Nominated projects and proposed action

It was initially expected that a number of projects would be reviewed across the respective classification of roads within the Cessnock LGA and that there would be three to four project reviews to be completed. However, on commencement it was apparent that State Road projects would not be included and that the audit would primarily focus on Local Roads.

As a result it was necessary to consider more projects because not every project had all of the key design aspects and type of construction which would be required to appraise all aspects of the audit requirements. A wider range of projects across multiple components of the capital works construction and capital works renewal programs were selected in conjunction with Council's audit liaison manager.

The projects reviewed for the purposes of the audit were as follows:

Program / audit number	Project	Proposed Audit: Review of Design and / or Construction
Local Roads Construction Program 2012 – 13		
1 CRL_2013_001	Lindsay St, Cessnock <ul style="list-style-type: none"> Staged construction of kerb and gutter and minor road drainage works 	Propose to review original design documentation, construction records and work as executed plans if available. Is there documentation for reduced scope and reasons for omission of K&G.
2 CRL_2013_002	Wilderness Road, Rothbury <ul style="list-style-type: none"> 4 stage project with stages 1-3 designed and completed. Stage 4 planned to commence in July 	Propose to inspect detailed design documentation from Stages 1 – 4 (best practice and consistency of approach) and construction standard and quality records for Stages 1 – 3.
3 CRL_2013_003	Sandy Creek Road, Quorrobolong <ul style="list-style-type: none"> Traffic safety works - Road Toll Response 	Review Project Brief. Review of design and construction documentation.
4 CRL_2013_004	Old Matland Road, Cessnock <ul style="list-style-type: none"> Traffic safety works - Road Toll Response 	Review Project Brief. Review of design and construction documentation.
Vineyard Roads Construction Program 2012 – 13		
5 CRV_2013_001	Broke Road, Pokolbin <ul style="list-style-type: none"> Staged reconstruction, widening and road drainage improvements to Broke Road west of McDonalds Road intersection to Singleton boundary 	Review Project Brief. Design by GHD so not intending to audit due to potential conflict. Propose to inspect current construction practices and quality records for current works.
Bridges Construction Program 2012-13		
6 CBS_2013_001	Millgang Bridge, Ellalong	Review Project Brief.

Program / audit number	Project	Proposed Audit: Review of Design and / or Construction
	<ul style="list-style-type: none"> Survey, Design and Replacement of Timber Bridge with Concrete Bridge – Local Infrastructure Renewal Scheme 	Propose to review and inspect current bridge and / or structural designs for Peer Review conformity.
7 CBS_2013_002	Crawford Bridge, Congewai	Review Project Brief.
	<ul style="list-style-type: none"> Survey, Design and Replacement of Timber Bridge with Concrete Bridge – Local Infrastructure Renewal Scheme 	Propose to review and inspect current bridge and / or structural designs for Peer Review conformity.
Drainage Construction Program 2012-13		
8 CDR_2013_001	Whitburn Estate Trunk Drainage (NE Highway culvert), Grata	Whitburn Estate drainage designed and complete.
	<ul style="list-style-type: none"> Upgrade and replacement of the culvert under the New England Highway downstream of Whitburn Estate – Jointly funded by RMS 	It is understood that scope of works has not yet included the New England Highway and it is unlikely at this stage that Council will complete the works under the road.
Local Roads Renewal Program 2012-13		
9 RRL_2013_001	Blackhill Road, Blackhill	Review Project Brief.
	<ul style="list-style-type: none"> Reseal and Heavy Patch 	Design consultancy awarded but design not yet available.
10 RRL_2013_002	Sandy Creek Road, Brunkerville	Review Project Brief.
	<ul style="list-style-type: none"> Rehabilitation / reconstruction and seal 	Design consultancy awarded but design not yet available.
Regional Road Renewal Program 2012-13		
11 RRR_2013_001	Majors Lane, Kaibah	Propose to inspect detailed design documentation from Stages 1 – 3 (best practice and consistency of approach) and construction standard and quality records for Stages 1 – 3.
	<ul style="list-style-type: none"> 4 stage project with stages 1-3 designed and completed. Stage 4 planned for 13/14. 	
Local Roads Construction Program 2011 – 12		
12 No code – older project	Paynes Crossing Road	Review construction records of works undertaken to date.
	<ul style="list-style-type: none"> Initial seal and realignment at The Grange. 	

4.3 Design review and compliance

The planning and design function of the Council Roads Program received a severe degree of criticism in previous audit reports and planning reviews.

In particular, the absence of geotechnical investigations and associated pavement designs was noted by SMEC and highlighted by Morrison Low as being substantial omissions from best practice road design and construction planning.

Traditional road design and associated disciplines have long been standard practice for Council in the preparation of its construction program documentation. The integrated relationship between strategy development, ground survey, alignment planning, environmental assessment, drainage design, geometric design and structural design (where required) has been well understood by Council staff.

The assessment of existing ground and road subgrade conditions is also a key component of this integrated relationship. While the circumstances of the previously identified lack of geotechnical investigations and detailed pavement design are not known, current project documentation provides evidence to the contrary, that these are now prominent considerations.

The roads program audit has established that the previously identified deficiency in relation to geotechnical investigations and preparation of project specific pavement designs has been eliminated. As evidence to support this outcome a number of recent and current project circumstances can be cited as follows:

- Commitment to quality pavement construction processes and immediate rectification of surface defects where required, in conjunction with Robson Contractors.
- Detailed geotechnical investigations and pavement designs on two stages of Broke Road West.
- Provision of geotechnical investigation reports in recent tenders advertised by Council – Black Hill Road, Blackhill.

A full appraisal of Council's road design practices is provided in a series of checklists for the nominated project reviews in Appendix B. This shows a high degree of compliance for all of the integrated design elements associated with preparation for road construction.

The requirement for structural designs to be peer reviewed by a qualified consulting engineer has been checked. It is apparent that there has been some independent proof checking on the design of the Milgang Bridge restoration project. The bridge was analysed in detail as part of the design process and a separate certification was undertaken.

There was no other supporting evidence of compliance with this requirement, primarily because there was little recent structural design documentation. This requirement should be included in Council's detailed design checklist.

4.4 Construction review and compliance

Council's road construction practices were also the subject of some severe criticism in the previous audit reports. These focussed on a variety of observed deficiencies and omissions which in essence lead to the conduct of this audit and the preparation of this report.

As is the case with road design and its associated inputs, the construction function is a combination of multiple inputs to create a new road pavement and associated facilities such as drainage, road side furniture and landscaping.

Apart from workplace health and safety which is undertaken as a first priority on all construction sites, there are three essential elements to quality road construction and the realisation of the design life for the project.

- provision of adequate surface and subsurface drainage
- adequate assessment of subgrade conditions and preparation of pavement foundations
- correct selection and use of pavement materials.

Other aspects of road construction such as roadside furniture, signposting, line marking and landscaping create the visual impression but quality drainage and pavement construction are what maximises the design life and long term asset condition. As a result the construction review has focussed on these critical aspects.

Only two construction projects were underway during the timing of the roads program audit. These were major reconstruction (widening and pavement strengthening) on Broke Road West and safety works and pavement improvements on Old Maitland Road.

A number of recently completed projects were also inspected to assess the condition of the finished road surface and surrounding features such as drainage installation and proximity of any external hazards such as trees or power poles. These were recently completed stages of long standing construction on Majors Lane at Keinbah and Wilderness Road at Rothbury. An inspection was also undertaken on the partially completed works on Lindsay Street in Cessnock.

As a summary, the construction documentation witnessed and the construction site practices observed during the roads program audit lead to a general conclusion that significant improvements have been made over the immediate past two year period. Circumstances and references to support this statement can be found in the site documentation.

- Successful completion of Broke Road East by external contractors.
- Audit awareness of detailed planning and internal project controls on major reconstruction works currently underway at Broke Road West
- Visual inspections of recently completed works on Majors Lane and Wilderness Road
- Observations of current practice and completed sections on Old Maitland Road

A full appraisal of Council's road construction practices is provided in a series of checklists for the nominated project reviews in Appendix C. Despite the improvements noted above, this shows a mixed degree of compliance for all of the various construction practices and workplace standards.

The works delivery documentation folders provided a very good representation of the systems now in place for road and drainage construction. There are multiple folder tabs providing systematic forms for on-site planning and records for materials delivery, inspection and testing, as well as job safety and risk management. However, these forms were not always used on every project reviewed. Compliance with this system is happening but does need rigour to use the system to its maximum benefit.

One aspect that is traditionally neglected in the majority engineering projects, across many organisations, is the project completion, closeout and handover back to asset owner. The finalisation of the project should include activities as follows:

- Works completion statement and report
- Final quantities reconciliation
- Close out financial costs

- Close out quality records
- Photography / video records
- Handover to asset section

It is confirmed that the Works Delivery management team is progressively implementing these finalisation aspects into the management systems, albeit that no completed handover report was observed. This is an ongoing (continual improvement) initiative to complete the project life cycle and to provide for ongoing asset management.

The construction checklists are supplemented by a series of site visit inspection notes and records and these are provided in Appendix D. Observations from these site visits to recent and current construction sites include a selection of photographs showing completed works and work in progress.

On current projects these highlight specific aspects of the construction process and provide a visual assessment of the progressive outcomes. On the completed projects the photographs are not intended to highlight specific issues or precise locations, the purpose being to show the nature of the finished product and some comparisons with adjoining sections yet to be upgraded.

5. Conclusions and recommendations

The roads program audit has been undertaken by GHD in accordance with the brief established by Council. There is no formal standard for an audit of this type and as such the structure of the report and the method of review of Council documentation has been progressively developed.

5.1 Audit objectives

As outlined in Section 1.3 the objectives of the proposed Roads Program Audit were prescribed by Council following the Morrison Low reports. As a summary, these objectives are provided in tabular format against a range of project observations and colour coded and tick boxed for visual observation of compliance as follows.

Audit objective	Achieved	Partially Achieved	Not achieved
To ensure that standard construction techniques are used and that quality control is being undertaken during and on completion of works.			
Observed construction on Broke Road West	✓✓✓		
Observed construction on Old Maitland Road	✓✓✓		
Observations of recently completed works on Majors Lane and Wilderness Road		✓	
To ensure that progress has been made against previous reports to ensure that project management practices are being followed.			
Observation of project management practices on Broke Road design	✓✓✓		
Observation of project management practices on Broke Road construction	✓✓✓		
Observation of project management practices on Old Maitland Road construction		✓	
That there are appropriate project management practices in place from the initial project brief to the completion of works			
Development of standard briefs for new works at Brunkerville and Black Hill	✓✓✓		
Detailed construction planning and design interface coordination on Broke Road	✓✓✓		
Review of whole of project documentation for Majors Lane		✓	
To provide best practice outcomes for this community and a further implementation plan, if necessary, on any additional options for improvement on the quality of road construction undertaken.			
Progress on existing implementation plan can be confirmed	✓✓✓		
Need or otherwise for further implementation plan to be established		✓	
Progress with project closeout and handover to asset section.		✓	

In conclusion it can be confirmed that in the opinion of the Roads Program Audit team the objectives of the audit have been met and the observed performance of the Design Delivery and the Works Delivery components of the program are being undertaken in a satisfactory manner.

5.2 Progress with Morrison Low implementation plan

The Morrison Low implementation plan has been reviewed to assess progress with assigned actions. This takes the form of an additional column in the landscape table for commentary on the advised status of the various action items. Details are provided in Appendix E.

Points to note from this review are as follows:

- Item 1.1 and Item 2.1 - CHAIR Workshops are now being conducted as Council implements a Safety in Design process as part of Workcover legislation.
- Item 1.2 - Design team includes collaboration with construction coordinator during Concept Design sign-off.
- Item 1.4 and Item 2.3 - Design review checklist should continue to be used as part of Concept Design development and as part of verifying Detailed Design by external consultants.
- Item 3.1 - Peer Reviews of structural design by certified consulting engineers are to be incorporated into design review checklist.
- Item 4 - Pavement design and integration of design philosophy now incorporated into detailed geometric design and calculation of construction quantities.
- Item 4.4 - Geotechnical investigations and other critical design inputs – survey, traffic, environmental assessment, public utilities identification are well embedded into design processes.
- Item 5 – Ongoing commitment to training in regard to technical specifications and tendering processes.
- Item 6.1 and Item 7.1 - Construction planning includes site specific checklists in regard to safety / risk assessments, as well as traffic management planning, materials supply and management, inspection and test plans, environmental safeguards and resource planning.
- Item 6.2 - Site based risk assessments and Safe Work Method Statements are prominent in construction activities, tool box meetings well documented.
- Item 6.3 and Item 6.4 - The proposed appointment of a Works Engineer / Quality officer is encouraged to promote the preparation of project completion reports and handover of the finished product back to the asset section for future management actions.
- Item 6.6 - Review of plant utilisation and external hiring arrangements is ongoing as part of overall fleet management.
- Item 6.7 - Inspection and test plans, including conformance results, are documented for each project.
- Item 7.2 – There is limited documentation relating to systematic reporting of compliance and measurement of time, quality and cost performance. This will be critical to further development of project finalisation reports and records as part of handover documentation back to the asset section.

5.3 Ongoing action plan

It is believed that there is a need for an ongoing action plan associated with the Cessnock Council Roads Program. As outlined in Section 1 this was a \$20 million program in the 2012 / 2013 financial year and this is likely to continue with RMS grants for the Vineyards Roads project over coming years. Clearly this is a major undertaking and needs to be expended efficiently and prudently.

This represent an opportunity for Council to confirm its project management system requirements for the whole project life cycle from strategy development through to concept design, detailed design, construction and asset handover.

The systems observed in this Roads Program Audit are in a state that can be advanced to provide an integrated approach across strategy, design and construction.

Key ongoing activities which should form the basis of a future action plan are as follows:

Strategy development and project briefs

- Continuation of comprehensive brief delivery.
- Establish procedures for design / construction interface during design development.
- Confirm in project brief the need for formal project finalisation and handover back to asset section.

Design delivery

- Formalise submission of design checklists as conforming to project brief and taking into account identified constraints and issues.
- Provide for mandatory discussions with construction staff as concept designs are developed and detailed planning commences.
- Conduct formal Safety in Design workshops and utilise Risk Management practices to identify and mitigate potential risks and hazards.
- Provide for formal Peer Review and independent verification by certified consulting engineers of any in-house or external structural design associated with bridges or other major civil structures.
- Provide for formal sign-off Concept Design proposals prior to issue for tender by external design consultants.
- Include formal estimates as part of detailed design, prepared in conjunction with works delivery staff.

Construction delivery

- Establish full use of project planning and construction management systems in accordance with the works delivery
- Continue to develop project management skills and technical training to works crews and ensure ongoing improved performance
- Maintain diligence with Safe Work Method Statements and project specific risk assessments on all projects
- Confirm need and establish practice for project finalisation reports and records as part of handover documentation back to the asset section. This would include a formal works completion statement and report, final quantities and cost reconciliations, close out of quality records, provision of project history via photography or video and provision of a formal handover back to asset section.

Appendices

Appendix A – Meeting details



Minutes

5 June 2013

Project	Cessnock Council - Roads Program Audit	From	Barry Hancock
Subject	Inception Meeting	Tel	02 4979 9054
Venue/Date/Time	Cessnock Council offices Thursday 23 May 2013	Job No	22/16840
Copies to	Nicole Benson; GHD leads		
Attendees	Nicole Benson (NB) Katrina Kerr (KK) Wade Crockett (WC) Paul Youman (PY) Gerard Morton (GM) Barry Hancock (BH)	Council Council Council (part) GHD GHD GHD	Apologies

Minutes	Action
<p>1. Introductions</p> <ul style="list-style-type: none"> Team members introduced themselves and their respective roles. It was confirmed that all communications should be between NB as Audit Manager and BH as GHD Project Manager 	Note
<p>2. General discussion</p> <ul style="list-style-type: none"> BH outlined road network and various classifications – Local, State and Regional. Local roads and Regional roads (RMS funded but Council controlled) would be focus of the audit. KK confirmed belief that CCC work on state roads was of good quality, possibly as meeting RMS standards. May not translate to regional and local road works. NB to send through works programmes for the past 3 years so GHD can target a variety of project types and sizes. Past 3 years will cover all works since last audit. GHD to send through proposed audit list for NB review and agreement. KK noted that Broke Rd West (currently under construction) is not being run as a typical Council project. Bound road pavement so Council is delivering to develop capability. This might be a good one to look at from a benchmarking perspective (potentially). Need to see how construction is going on-site. For GM inspections. Notice the day before is adequate. PPE will be required. We need to be accompanied by the site leader – Council contacts to be provided. Asset Manager (Phil Miles) defines the strategy. KK's group procure and deliver the projects within the strategy – either in-house or via external contract. NB will send through CCC organisational chart. "I&S" is now known as Community Services (reference in brief and past reports). 	<p>KK / NB</p> <p>BH</p> <p>GM / NB</p> <p>NB</p>

22/16840/102801

- GHD need to check that Morrison and Low (M&L) implementation plan is being responded to and implemented by Council. BH
 - Council to provide "Work in Progress" of implementation plan from previous reports. NB
 - WC requested we confirm qualifications of external peer reviewers to show they are suitably qualified. Note
 - Procurement: quality/compliance of material? This could be an issue.
 - KK couldn't be sure if there was a formal documented lessons learned process from previous projects.
- 3. Confirmation of brief requirements**
- BH went through the 6 bullet points of the brief to confirm scope and roles of the GHD team. GM to audit construction and related records. PY to audit design process. BH report author and point of contact.
 - GHD to provide Project Management plan, complete with details of Safety, Quality and Environmental Management systems and certifications. BH
 - There is another Morrison Low report that Council will send through for audit reference. NB
 - Audit to be completed within 8 weeks - GHD committed to an early completion to allow time for Council reviews. Assume Inception meeting is in Week 1. Note
- 4. Audit outputs**
- Agreed a "traffic light" indicator system would be a good mechanism for reporting compliance, progressing or action required. This is consistent with Council's current reporting formats. Note
 - Clarify in the report about independence of the audit and knowledge/relationships with particular staff. So that the audit is not, or is not seen to be prejudiced in any way. It was agreed that this would not be a problem. Note
 - GHD to supply proposed assessment methodology (checklists) and overall report structure outline prior to electing projects for auditing. BH
 - Council requires an issues register to show how issues are tracked and closed. Note
 - Audit to investigate mechanism for project signoff and handover back to Asset group. Note
- 5. Other matters**
- No other matters

Barry Hancock
Principal Roads and Highways Engineer



Minutes

6 August 2013

Project	Cessnock Council - Roads Program Audit	From	Barry Hancock
Subject	Close out Meeting	Tel	02 4979 9054
Venue/Date/Time	Cessnock Council offices 3.30 pm Wednesday 31 July 2013	Job No	22/16840
Copies to	Nicole Benson		
Attendees	Nicole Benson (NB) Wade Crockett (WC) Grant Wood (GW) Barry Hancock (BH)	Council Council GHD GHD	Apologies

Minutes

Action

1. Introduction and preliminaries

- Grant Wood was introduced as GHD Project Director and as the final reviewer and approver of the Roads Program Audit report
- It was confirmed that the audit report was completed primarily by BH with field inspection input from Gerard Morton (GM). The original plan for Paul Youman (PY) to undertake design reviews did not eventuate due to organisational changes in mid-June. As a result BH undertook these reviews as well as the report. It was confirmed that there would be no additional cost to Council.
- This change and the fact that a total of 12 projects (instead of the 4 or 5 originally nominated) has led to more time being required to complete the audit. Extensions of time have been requested and granted, with a now approved completion date of 9 August 2013.

2. General discussion on audit findings

- The format of audit report was discussed. The report was previously sent through as a first draft on 24 July 2013 and was discussed in a review meeting (BH / NB) on 25 July 2013.
- Report contains a number of appendices which provide meeting details, project checklists, site visit records and commentary on the implementation plan arising from the previous Morrison Low audit.
- The projects checklists looked at compliance with a number key aspects associated with design delivery and construction delivery. These will form separate appendices to the report.
- Organisation charts supplied by Council were for the benefit of the audit team and do not need to be included in report.

22/16840/103660

- As outlined above there were a total of 12 projects reviewed as part of the audit. This was primarily to get suitable coverage of the associated project activities from strategy to completion. These also included recent development projects for which design is in progress and as such no construction has commenced.
- In general terms the audit findings in relation to the asset strategy and project briefing requirements are positive. Apart from the oldest project at Paynes Crossing Road, all current and recent projects have had comprehensive briefs issued.
- The Design Delivery function was also found to be in good stead. While the level of design development and documentation was variable for a range of different projects, the inclusion of critical design inputs such as detailed survey, geotechnical investigations and pavement design were all prevalent in design development.
- Detailed Concept Design and Detailed Design drawings are now outsourced from preliminary concepts developed by Council. For most part Council's detailed design checklist is not used but this should be offset by design reports from external consulting firms.
- In regard to Works Delivery the systems in place for construction planning and resource management are acknowledged as being extensive. The structure of the works documentation folders is well set out and provides a number of standard checklists and forms, as well as provision for documenting site specific records such as traffic management plans, material supplies, inspection and test plans and in-situ testing results.
- However, it is apparent that not all of these forms are used all of the time on all of the projects. Additional training may be appropriate so that field staff fully utilise these resources.
- This system has resulted in a notable improvement in construction quality over that reported in earlier reports on construction practices. The use of RMS quality pavement materials and increased proficiency in the required construction techniques for these materials is reflected in the completed and partly completed projects inspected as part of the audit.
- The procurement of the correct material for pavement construction does need constant vigilance. The relatively new use of bound materials to provide heavy duty pavements requires tight specifications, particularly in relation to additive content, compaction methods and finishing techniques.
- As an example of this it was observed during site visits that asphaltic concrete being laid on Broke Road West was thicker than nominated in the design. Finished surface levels in one area were lower than the design and the difference was being made up in more expensive asphalt. Construction staff have advised that this was a one off event resulting from deliberate scraping the top off the heavily bound base after it did not set properly on a cold night. This has been eliminated as a problem through consultation with the pavement supplier to fine tune the mix design for winter conditions.

3. Progress with Morrison Low implementation plan and need for ongoing action

- The Morrison Low report has been specifically commented upon in an appendix to the audit report. This takes the form of an additional column in the landscape table for a GHD / RPA comment on the advised current status of the various action items.

4. Draft report comments and program for completion

- The draft report documents all of the activities conducted during the audit. This includes meetings, site visits, comprehensive reviews of project documentation and discussions with Council managers.
- The draft document was perused during the meeting to confirm structure and content and to allow discussion of the audit outcomes and proposed recommendations.
- The report is to be reworked as a Final Draft for comment by the audit manager prior to formal issue of the completed report. BH
- It is intended that the report be finalised for issue to Council by 9 August 2013. BH

Meeting closed at 4.30 pm

Barry Hancock

Principal Roads and Highways Engineer

Appendix B – Design delivery checklists

[illegible]

Appendix C – Works delivery checklists

GHD Roads Program Audit

Cessnock City Council

GHD Roads Program Audit 6		1	2	3	4	5	6	7	8	9	10	11	12	Overall Comments / Status Identification
Roads Division - Program Audit - Roadside Inspection														
Roadside Inspection - Site Reports														
Project Information	Yes	Yes	Not signed	Yes	Not signed	Yes	N/A	N/A	Yes	N/A	N/A	Not signed	Not signed	Formal authorisation observed but not on every project
Project development plan	Yes	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Separate	Site specific development plans observed
Design and construction	Yes	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Not signed	Detailed drawings observed - specifications not in folders
AS/NZS 1546	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No records observed
Site inspection checklist	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Site specific checklists prominent on each project
Safe work method statement (SWMS) / Safe Work Method Statement (SWMS) / Safe Work Method Statement (SWMS)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Comprehensive records observed
Project on and off plans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	IT's observed
Contaminated materials and soil tests	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Daily checks and records observed
Environmental management plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Included in site management checklist
Settlement and erosion control plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Plans for erosion and sediment control observed
Traffic control plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Traffic management and control plans observed
Water management	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Records of rainfall receipts or most projects
Client's requests	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Forming materials records
Internal audit	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Forms in folders but mostly not completed
Subcontractor reports	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Records of sub-contractors - plant, traffic management observed
Hold point reviews	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Forms in folders but mostly not completed
Site visit observations														
Correct materials being	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Site visit notes are generally complementary
Quality control and test results	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Observed
Worksite safety (signage)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Comprehensive
Material placement - observed during construction	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Photos demonstrate improved construction techniques
Preventive maintenance observations	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Good practice observed
Project finalisation														
Project completion statement and report	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Project completion reports not observed - forms available
Final quantified report (FQR)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Some quantified documentation but not as part of final statement
Close out checklist	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Works of project close out analysed - breakdowns observed - not known
Close out final report	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not evident - required for quality control
Photography / video reports	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not evident - would be okay way to record / after about condition
Handover to client / council	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not evident - required for effective ongoing asset management

Cessnock RPA Projects and Checklists

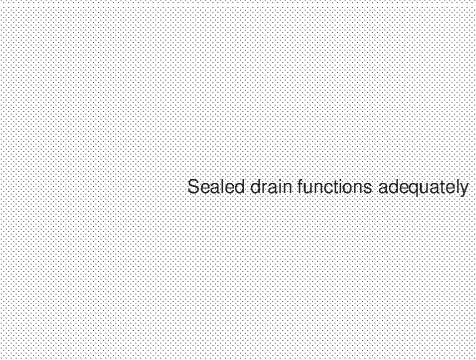
Appendix C

Appendix D – Field inspection notes and records

Project Detail / Site Observations	Audit Project #1 Lindsay Street, Cessnock
Length of stages	<ul style="list-style-type: none"> Work undertaken between Mavis St and Burnett St
Resources (internal / external)	<ul style="list-style-type: none"> Internal crews
Pavement condition	<ul style="list-style-type: none"> It appears that kerb and gutter was proposed and earthworks undertaken to suit, but it was never installed. Seal has been undertaken to edge of pavement and a drain formed where kerb would normally be installed. New pavement looks good, with one section of early failure that has been repaired.
Any deterioration	<ul style="list-style-type: none"> Some minor depression visible in pavement



Kerb and gutter not completed due to funding limitations



Sealed drain functions adequately



Some pavement distress at driveway – to be monitored

Project Detail / Site Observations	Audit Project #2 Wilderness Road – Stage 3
Length of stages	<ul style="list-style-type: none"> 500m approximately
How constructed (Under traffic / Staging)	<ul style="list-style-type: none"> Under traffic in manageable sections. Traffic lights used to control traffic
Design	<ul style="list-style-type: none"> Shoulder widening, then 200 mm overlay with 2 coat seal
Materials	<ul style="list-style-type: none"> ARRB standard gravel
Testing	<ul style="list-style-type: none"> Insitu density testing undertaken during construction
Quality	<ul style="list-style-type: none"> Records on file incomplete
Safety	<ul style="list-style-type: none"> Work on-site is complete.
Resources (internal / external)	<ul style="list-style-type: none"> Generally internal work crews with some hired in plant and labour
Pavement condition	<ul style="list-style-type: none"> Recent work is holding up well. No obvious deterioration Inconsistency in linemarking, some sections have centreline and edge line, others only centreline
Any deterioration	<ul style="list-style-type: none"> None visible



Recent work on Wilderness Road – driveway treatment and drainage well defined.

Recent work on Wilderness Road – shoulder locally narrowed at power pole.





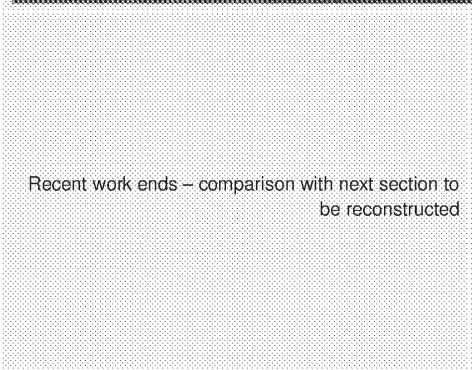
Completed work – good surface and delineation.



Barrier installations with end treatments well defined



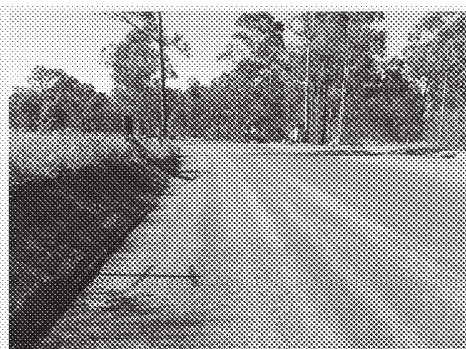
Widening for minor intersection safety at access to development site.



Recent work ends – comparison with next section to be reconstructed



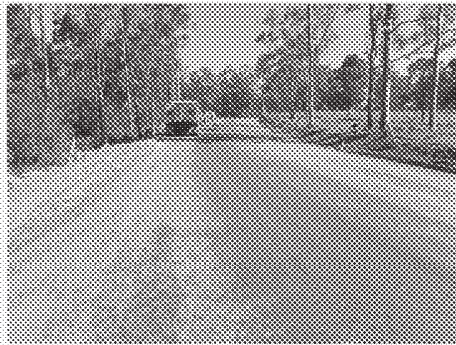
Project Detail / Site Observations	Audit Project #4	Old Maitland Road
Length of stages	<ul style="list-style-type: none"> 440m complete, 440m complete, 200m last stage underway 	
How constructed (Under traffic / Staging)	<ul style="list-style-type: none"> Under traffic using traffic controllers. Road opened out of work hours 	
Design	<ul style="list-style-type: none"> Edge widening, 200mm thick, then approx. 100mm subbase over existing and 250mm base 	
Materials	<ul style="list-style-type: none"> ARRB standard gravels 	
Testing	<ul style="list-style-type: none"> Insitu density testing undertaken during construction by RCA. Viewed records on file 	
Quality	<ul style="list-style-type: none"> TBA 	
Safety	<ul style="list-style-type: none"> Works being undertaken safely. Records on file complete 	
Resources (internal / external)	<ul style="list-style-type: none"> Generally internal work crews 	
Pavement condition	<ul style="list-style-type: none"> Completed work looks good. Revegetation growing well and job looks very tidy. Work underway looks good. Some issues being experienced with gravel staying wet in shaded areas, causing localised failures under traffic. 	
Any deterioration	<ul style="list-style-type: none"> None visible 	



Pavement works within existing formation.

Completed pavement works.





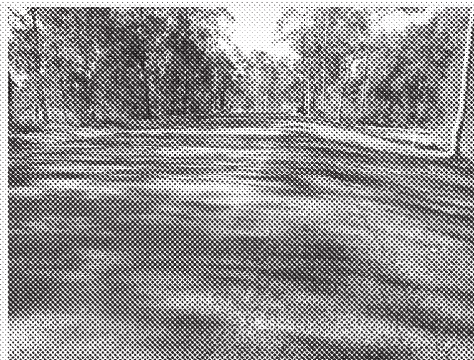
Pavement construction complete.

Shaded areas remain moist – need to be checked
prior to sealing.



Completed work and grassed table drain.

Completed work and grassed verge.

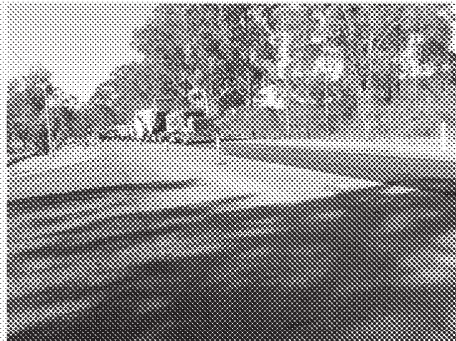


Project Detail / Site Observations	Audit Project #5 Broke Road West
Length of stages	<ul style="list-style-type: none"> 500 m approximately Stage 1 – being asphalted Stage 2 – boxing out edge and sub base to edge Stage 3 – Culvert extension preparations underway
How constructed (Under traffic / Staging)	<ul style="list-style-type: none"> Under traffic using traffic lights, constructing road in halves
Design	<ul style="list-style-type: none"> As per GHD design
Materials	<ul style="list-style-type: none"> ARRB standard sub base gravel Stabilised base to RTA standard – having issues with duration of setup of stabilised material in cold conditions
Testing	<ul style="list-style-type: none"> In-situ density testing undertaken during construction by RCA. Viewed records – all look OK
Quality	<ul style="list-style-type: none"> Viewed QA records held on-site, including hold point releases – all look complete. Generally not using any supporting evidence, such as checklists for signoffs of hold points, just electronic signoff by PM
Safety	<ul style="list-style-type: none"> Inspected records of inductions, tool box talk etc on file – all look complete and up to date
Resources (internal / external)	<ul style="list-style-type: none"> Generally internal work crews with some hired in labour. Some external plant hired in.
Pavement condition	<ul style="list-style-type: none"> Completed work looks tidy. Prime seal has held up well under traffic prior to asphalt. Significant areas of correction course required in areas being asphalted. Also, depth markings on seal indicate depth of asphalt required in areas not corrected is greater than target depth of 40 mm. Therefore likely to be large overuse of asphalt. It was noted that stringing of pavement layers is not undertaken – this should be considered as a continuous improvement initiative. Pavement levels are controlled by grader operator off pegs and then surveyed.
Any deterioration	<ul style="list-style-type: none"> None visible



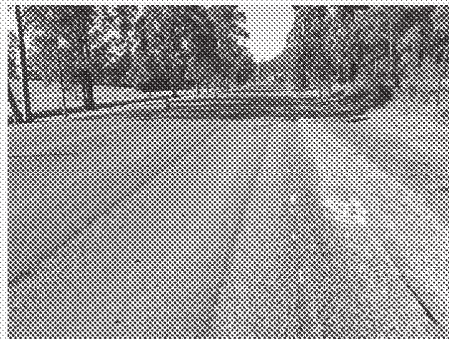
Boxed out shoulder and compaction of pavement material

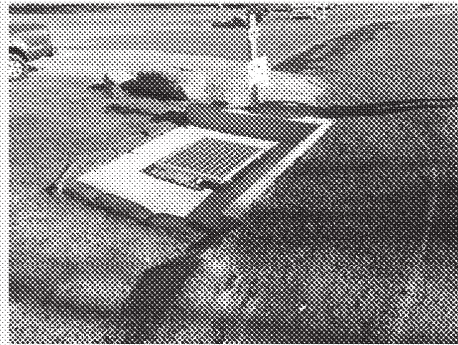
Excavated shoulder – subgrade compacted



Completed pavement – initial asphalt surfacing.

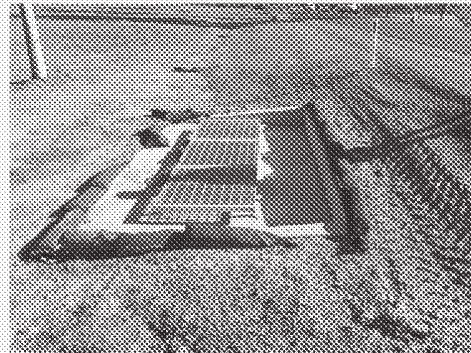
Completed pavement – preparations for asphalt surfacing





Drainage pit well-constructed – erosion and sedimentation control in place

Innovative pit design to replace deep headwall – potential hazard eliminated.



First layer of asphalt laid.

Turn out at property access – pavement sealed well into driveway

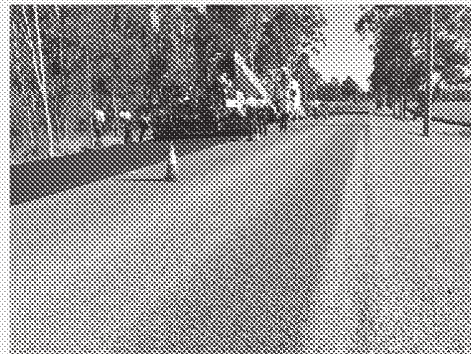




Concrete drain well established – pavement finish lower for asphalt thickness



Finishing works on westbound lane – completed pavement and wide verge on eastbound.



Wide verge and flattened batter – erosion and sedimentation control at property line.



Project Detail / Site Observations	Audit Project #11	Majors Lane – Stage 3
Length of stages	<ul style="list-style-type: none"> 500m approximately 	
How constructed (Under traffic / Staging)	<ul style="list-style-type: none"> Under traffic in manageable sections. Traffic lights used to control traffic 	
Design	<ul style="list-style-type: none"> Shoulder widening, then 200 mm overlay with 2 coat seal 	
Materials	<ul style="list-style-type: none"> ARRB standard gravel 	
Testing	<ul style="list-style-type: none"> Insitu density testing undertaken during construction by Hunter Geotech 	
Quality	<ul style="list-style-type: none"> Records on file incomplete 	
Safety	<ul style="list-style-type: none"> Work on-site is complete 	
Resources (internal / external)	<ul style="list-style-type: none"> Generally internal work crews with some hired in plant and labour 	
Pavement condition	<ul style="list-style-type: none"> Recent work is in good condition. No obvious deterioration A 50m section without edge line looks out of place, since there is edge line elsewhere. 	
Any deterioration	<ul style="list-style-type: none"> Older stages are showing signs of deterioration, pavement damage including significant potholing in some areas. 	



Recent work on Majors Lane – good surface finish and delineation.

Recent work on Majors Lane – good surface finish and delineation





Typical pavement failure on next section for restoration

Typical pavement failure on next section for restoration



Appendix E – Progress on Morrison Low implementation plan

MORRISON LOW IMPLEMENTATION PLAN
with response status as advised and with Roads Program Audit observations.

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA notes and observations
1. Stormwater and Trunk Drainage Designs	1.1 A construction risk and assessment and safety in design workshop to be carried out.	By June 2011	All construction and design staff	Group Leader Community Services	Workshop required identified as WorkCover Construction Hazard Assessment Implementation Review (CHAIR). CHAIR Workshops scheduled for projects in design. CHAIR 2 Workshops completed for designs carried out in house.	Make documentation available.	Workshops have been conducted
	1.2 Design details should be established and included at the design stage	By 1 March 2011	Design Engineers	Design Delivery Manager	Concept Design to include some detail drawings and reference to CCC Standards for Engineering Design details. (e.g. Sale St, Greta) Design review methodology amended to include collaboration with construction coordinator and acceptance of plans at Loading Sign Off to ensure level of detail needed is provided. Agreed long-term action to develop set of standard engineering details in collaboration with Development Services.	Participate in review of CCC Standards for Engineering Design led by Development Services / S & S.	In progress
	1.3 All drainage designs should include a review of overland flow paths for high intensity storm.	By 1 March 2011	Design Engineers	Design Delivery Manager	Consultant designers for 01 & 02 been briefed to provide overland flow paths for high intensity storm. Design with review of flow paths in progress. Design including overland flow paths for projects 01 & 02 received. Included in Design Review Check List on IMS.	Prepare standard consultant brief with requirement for documentation of overland flow paths for high intensity storms.	Briefs now standard practice
	1.4 Design checklists should be completed for each project and	By 1 January 2011	Design Engineers	Strategic Asset Manager	Design Review Checklist Version: May 2010 is in use. Design Review Check List	Nil	Noted ... checklist use to be used at

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA roles and observations
	verified by manager or another appropriately qualified staff.				completed and designs amended for 01 & 02. Design Review Checklist reviewed at Concept Design Sign Off. Complete.		Concept Design stage
	1.5 Drawing sheets need to include information showing authorisation and review of design.	By 1 March 2011	Design Engineers	Strategic Asset Manager	Authorisation and reviews continuing as per previous practice as evidenced in bottom LH of title block. Authorisation and review evidenced on project loading Sign Off. Identified need for Drawing Amendment Register. Title Block Revised for 01, 02, 06, 08, 09, 16 and 38. Title block of template drawing sheet amended. See .1.1	Nil	Noted
2. Geometric Road Design	2.1 A construction risk and assessment and safety in design workshop to be carried out. 2.2 Design details should be established and included at the design stage 2.3 Design checklists should be completed for each project and verified by manager or another appropriately qualified staff.	By June 2011	All construction and design staff	Group Leader Community Services		Nil	As above
		By 1 March 2011	Design Engineers	Strategic Asset Manager	See .1.2	Nil	As above
		By 1 January 2011	Design Engineers	Design Delivery Manager	Design Review Checklist Version: May 2010 in use. Design Review Checklist completed and designs amended for 06 & 38. Design Review Check Lists presented for review at Sign Off for Concept, Prelim and Final Design Stages. Complete. See 1.5	Nil	Noted
	2.4 Drawing sheets need to include information showing authorisation and review of design. 3.1 Nil	By 1 March 2011	Design Engineers	Design Delivery Manager		Nil	N/A
3. Structural		Nil	Nil	Nil	Nil	Nil	Peer review to be confirmed for

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA roles and observations
and Bridge Design							any in house structural design.
4. Pavement Design	4.1 In order to design based on best practices consider implementing one or more of the following: 4.2 Training of specialist in house with CIRCLY and AUSTROADS pavement design principles.	Nil	Nil	Nil	Nil	Nil	N/A
	4.3 Develop and use a standard design table which is based on AUSTROADS or Obtain external advice from pavement expert familiar with CIRCLY or AUSTROADS requirements.	Completed June 2011	Design Engineers	Design Delivery Manager	AUSTROADS advanced pavement design training completed by Design Engineers. Complete.	Nil	Noted
	4.4 Obtain and document geotechnical advice on expected sub grade CBR strengths for all proposed pavement works, which should also be shown on the drawings	Completed	Design Engineers	Design Delivery Manager	Standard design table developed and available on system. Complete.	Nil	Noted
		June 2011	Design Engineers	Design Delivery Manager	Geotech services briefed and received for projects 16 & 38. Geotech CBR strengths included on design drawings. Add requirement to Design Review Checklist. Complete.	Nil	Detailed geotechnical reports now undertaken.

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA roles and observations
	4.5 Obtain and document traffic figures or at a minimum road classification which indicate the level of traffic for all proposed pavement works and be shown on the drawings	June 2011	Design Engineers	Design Delivery Manager	Traffic loading specified in briefs to consultants based on traffic classifier counts and road classifications based on CCC engineering requirements for development. Consultant briefed to show traffic loadings and classification on drawings and revise design, review checklist to include Traffic loading and classification. Same approach used for in house design. Complete.	Nil	Traffic projections included in geotechnical briefs.
	4.6 Provide training for council staff involved in the production of these designs to help become aware of how the RTA material specification works and why they are a requirement.	Completed	Design Engineers, Construction coordinators, Project Engineers, Construction Team Leaders Design Engineers	Design Delivery Manager Group Leader Com Services Construction team leaders	AUSTROADS advanced pavement design training complete by Design Engineers which detailed RTA standards such as 3051. Design for pavements, details and compaction now shown on plans. Complete.	Nil	Concur
	4.7 Geotechnical testing of sub grade to be carried out prior to pavements being considered.	Completed	Design Engineers	Strategic Asset Manager	Geotech investigation undertaken for all reconstruction projects. Geotech advice included in pavement design considerations. Complete.	Nil	Confirmed
5. Technical Specifications for Biennial Tenders	Internal training to all construction teams to ensure that they have up-to-date knowledge of current tender documents	End March 2011	Construction and Maintenance Coordinators, Quality coordinator and team leaders	Works Delivery	Coordinators informed to ensure they review current biennial tender documentation	In house advice and requests for relevant staff to review existing tender documentation as required.	Ongoing
6. Construction Methodology	6.1 Construction documentation should be tailored to be specific for the site	End March 2011	Construction and Maintenance Coordinators.	Works Delivery	All project file documentation is site specific.	Management plans have been reviewed and updated.	Confirmed site specific nature of plans signed.

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA roles and observations
gy			Quality Coordinator and team leader			Specific Plans prepared.	
	6.2 Specific task and risk in WMS need to be identified and addressed	End March 2011	Construction and Maintenance Coordinators, Quality Coordinator and team leaders	Works Delivery	Continual review of SWMS is being undertaken. Initial Risk Assessments undertaken onsite.	Continual Review on a needs basis. Reviewed through incident report documentation and risk assessments.	Ongoing
	6.3 The extent of material testing undertaken needs to be reviewed to ensure compliance with product.	End March 2011	Construction and Maintenance Coordinators, Quality Coordinator and team leaders	Works Delivery	Testing undertaken in accordance with Inspection and Test Plans.	Nil	Noted
	6.4 Provide feedback from the site for formally capturing as built information as part of project closure	End June 2011	Construction Coordinators	Nil Works Works Delivery	Works as Executed plans under preparation for Wollombi Bridges. Set of plans marked up to show as executed in field, review of level of details in Works as Executed plans to be determined by Cap Works Project Control Group.	Resources being looked at as part of Works Delivery review to ensure this is captured accurately.. Works Engineer/Quality officer to be employed.	Potential appointment noted. Documentation for project closeout and asset handover is in development.
	6.5 Personnel for Survey, Traffic Control, Concreting (other minor works) and material testing are externally	End March 2011	Manager Infrastructure Works	Group Leader Community Services	Considered as part of Works Delivery Review.	Works Delivery restructure includes additional	Noted -- staff resourcing and skills development is ongoing.

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA roles and observations
	sources. Whilst the general consensus in Council is that this is the most efficient, it probably should be reviewed as giving the best values for money and best management outcomes					labour resources to cover these roles and staff vacancies due to leave etc.	
	6.6 Ongoing reviews of plant/machinery will be undertaken to ensure the most suitable plant is nominated in Council's Plant Replacement Program. An example is the replacement of the current 20T excavator with a 13T excavator with knuckle boom etc.	End March 2011	Manager Infrastructure Works	Group Leader Community Services	Review of plant utilisation and external hiring have been reviewed and recommended plant replacements proposed.	Nil	Noted --- fleet management and optimisation is ongoing.
	6.7 Quality checks will include improved ITPs with designated hold points expanded and a requirement to be signed off by the Construction/Quality Coordinator.	February 2011	Construction Coordinators, Quality	Works Delivery	Inspection and Test Plans prepared by Works Delivery Manager.	ITPs are prepared for all projects. Hold points are included and physically applied but not included for in house projects.	ITPs observed in delivery folders.
	6.8 On site testing of placed pavement material will require compaction testing and moisture content to meet the adopted standards	End February 2011	Construction Coordinators, Quality Coordinator	Works Delivery	QA documents submitted back to design.	Nil	To be confirmed
7. Design and	7.1 Construction documentation should	31 January 2011	Construction and	Works Delivery	Site specific documentation implemented.	Nil	Noted

Problem / Solution	Actions required by Design Delivery	Specific milestone Dates	Resources	Accountabilities	Response Status	Further Action Required:	RPA roles and observations
Construction Project Development	be tailored to be specific for the site		Maintenance Coordinators, Quality coordinator and team leaders				
	7.2 Development of more systematic reporting of compliance for quality , cost and timeframes	End February 2011	Construction and Maintenance Coordinators, Quality coordinator ,team leaders project engineers, design Engineers, managers	Design Delivery Manager	Programs for the current design project under development Programs for all design projects complete and up to date and a plan for the combined program of works complete, Cost plans for design projects	Individual project timeframes and costs are regularly reviewed through Project.	Commitment to continual improvement.
	7.3 Ensure training is available for all staff involved in project management	End December 2011	Works and Strategy managers	All Managers	In house hands on training commenced, demonstrate competencies, PM IA audit	Ongoing	Concur
	7.4 Internal review of unit rates involving design, construction and maintenance staff	End April 2011	Works Manager	Works Delivery Manager & Design Delivery Manager	Review of unit rates undertaken. Inclusion of broad on-costs across organisation requires further investigation including waste disposal.	Ongoing	Concur
	7.5 Benchmarking of construction cost with similar bodies within the public and private enterprises	End June 2011		Works Delivery	Evaluating construction unit rates for benchmarking purposes.	Benchmark options being investigated. Works Engineer/Quality officer to be employed	In progress

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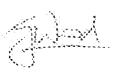
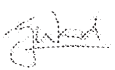
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