



A-LINED™ ASSESSMENT



Peka Peka to Otaki Expressway

VERSION 1.5

PREPARED FOR
New Zealand Transport Agency

DATE
07/16/2012

Mr. Robert Mitchell

New Zealand Transport Agency
Highways & Network Operations
50 Victoria Street, Private Bag 6995
Wellington
6141, New Zealand



July 16, 2012

Dear Robert,

Thank you for the opportunity to work with you on the Peka Peka to Otaki Expressway Project. The results of your Greenroads A-Lined™ Assessment are included in the following document. The report provides further details on how this project fits into the New Zealand Pilot Program and how certification may be achievable, if desired.

Right now the project is well-positioned to make positive impacts and Greenroads appears to be a suitable tool for measuring sustainability performance throughout the later phases. It would be great if you could keep us in the loop as design and construction progress. Next year we could also update the A-Lined Assessment under the scope of the Pilot Program if you wish; that may provide an interesting perspective for you.

Please let us know if you have any questions. We look forward to working with you on the next projects!

Sincerely,

A handwritten signature in blue ink, appearing to read "JL Anderson", is written over a light blue circular stamp.

Jeralee L. Anderson, Ph.D., P.E., LEED® AP
Executive Director

Cc: Mike Sammons, URS; Vanessa Browne, URS

INTRODUCTION

Greenroads Foundation spoke with authorized representatives New Zealand Transport Agency (NZTA) and URS (the “Project Team”) on July 3, 2012 to discuss sustainable design and construction approach for the Peka Peka to Otaki Expressway Project (the “Project”) located north of Wellington on the North Island of New Zealand. This Project’s assessment is the first of several assessments using the Greenroads Rating System that are part of the International Pilot Program for New Zealand.

The broad purposes of the A-Lined Assessment in the context of the International Pilot Program are to:

- Score the Project under the current version (1.5) of the Greenroads Rating System in its current lifecycle stage.
- Identify potential areas for improvement (gap analysis) or implementation.
- Examine the feasibility of implementing the Greenroads Rating System on this Project and for similar projects by the Owner, NZTA.

This technical memorandum summarizes our understanding of the Project, the evaluation method used, the potential scores and certification levels for the Project, and our recommendations to the Project Team. A brief description of the Greenroads Rating System is provided in Appendix A and the completed Greenroads Scorecard is located in Appendix B.

A summary report that includes the results of this Assessment will be provided upon completion of the International Pilot Program in approximately two years.

PROJECT DESCRIPTION

The expressway route runs from Peka Peka Road north of Waikanae to Taylors Road, north of Otaki. It passes through Te Horo along the existing SH1 alignment before crossing a second bridge over the Otaki River and bypassing Otaki to the east. Access to the expressway will be provided by a small number of interchanges. The goal of the project is to remove congestion points for through-traffic and improve journey time reliability through the Kapiti Coast grown area, as well as to improve safety. This corridor serves as one of the main routes north out of Wellington to the rest of the North Island.

DOCUMENTS REVIEWED

This assessment was based on a webinar with the NZTA and URS and a brief review of the following Project documents, as well as the project website <http://www.nzta.govt.nz/projects/peka-peka-to-otaki/>:

- Scheme Assessment Report Addendum – Peka Peka to Otaki Expressway dated January 2012.
- Scheme Assessment Drawings – Peka Peka to Otaki Expressway dated March 15, 2012.
- Appendices A-EE of the Scheme Assessment Report – Peka Peka to Otaki Expressway.

ASSESSMENT SCOPE AND METHOD

The objectives of an A-Lined Assessment are to:

1. Understand the general intentions of the Project Team.
2. Determine the constraints of the Project.
3. Identify potential areas where the Project may achieve points.
4. Identify potential new ideas that can be considered as Custom Credits.

Additionally, using the information provided to us, a Greenroads Scorecard is completed for the Project that reflects the general state of the Project as well as its potential for certification.

SCORING APPROACH

The Scorecard is completed using the approaches described below for Project Requirements, Voluntary Credits and Custom Credits.

Project Requirements

Project Requirements are evaluated based on the intent shown by actual Project documents or by verbal confirmation of intent. If clear intent is present, the Scorecard shows an “x” in the “Y(es)” column. If not, the “x” is placed in the “?” column. By design, it is *possible* to complete all 11 Project Requirements, so none will receive an “x” in the “N(o)” column. We recognize that this perspective is optimistic and that special constraints or local requirements may make some activities more difficult or onerous to document if certification is pursued.

- Demonstrating intent to complete a Project Requirement is sufficient for the purposes of this review. Most, if not all, Project Requirements can be addressed early in project decision-making. However, the complete documentation for all Project Requirements would be required if any future certification is to be pursued.
- For projects that are finalizing design or in construction at the time Greenroads is considered, it may be difficult or simply cost-prohibitive to meet the documentation requirements for certification (if desired). However, the goal of this review is to demonstrate the maximum project potential so that credits can be considered next time.
- Project Requirements carry no point value and do not add or subtract from the total score.

Voluntary Credits

Voluntary Credits are evaluated based on the intent shown by actual Project documents or by verbal confirmation of intent. If clear intent is present, the Scorecard shows a number in the “Y(es)” column for the number of points achieved. If not, a number is placed in the “?” column, meaning that many points could be considered as feasible for the Project. A number for the remaining points is placed in the “N(o)” column only if those points would not be reasonable or practical for the Project based on known constraints and scope.

- Demonstrating intent alone to complete Voluntary Credits is sufficient for purposes of this review. This is because the elected Voluntary Credits can often change throughout the design and construction process and the purpose of this assessment is to demonstrate a potential score. Again, the approach used makes the required documentation needs very transparent for future certification efforts while also providing notable opportunities.
- Credits marked as “Y” or “?” **in bolded text** could potentially reduce cost or be completed at minimal or no additional cost to the initial construction price.
- Voluntary Credits carry a variety of values and range from 1 to 5 points. Please refer to the *Greenroads Manual* for further details on how Voluntary Credits are weighted.

Custom Credits

Potential **Custom Credits** are evaluated similarly to the Voluntary Credits, but typically these are verbally described activities instead of documented activities. Custom Credits are submitted by registered projects pursuing certification and subjected to rigorous review prior to their approval for broad use in other projects. For purposes of this assessment, the Scorecard shows short titles that represent the basic concept of proposed Custom Credits as well as an estimated number of points. Points for Custom Credits are assigned according to the existing weighting scheme used in the *Greenroads Manual*.

LIMITATIONS OF ASSESSMENT

- Documents provided were reviewed for general, but not detailed, compliance with specifications in the *Greenroads Manual*.
- The results and recommendations provided in this study are only applicable to the version of the rating system used to complete this assessment: *Greenroads Manual v1.5* (dated February 4, 2011).

- The reported scores are not intended to be interpreted as actual earned ratings, completed certification reviews, or registration of this project. Rather, the scores reflect the current potential score of the project based on the documents provided for our review and verbal conversation with the Project Team.
- Under no circumstances shall NZTA or URS claim that this project has been certified by Greenroads Foundation as a result of this assessment.
- The completed Scorecard is intended to serve as guidance and as a learning tool for the Project Team and may not be published or distributed in any way. However, in accordance with the Greenroads Trademark & Copyright Policy, factual statements about the completion of this assessment as an “A-Lined Project” are acceptable. Additionally, NZTA may elect to designate this project as a Pilot Project according to the terms of the International Pilot Program (but this is not recommended for this Project due to its current stage).
- Greenroads respects reasonable requests for confidentiality, and reserves the right to publish, distribute or otherwise use such confidential project data to assess the project in aggregate with other projects, without exposing any distinguishing information about the project’s identity.
- This A-Lined Assessment applies only to the Peka Peka to Otaki Expressway project and results should be extrapolated to other projects with caution.

SCORE SUMMARY

A Greenroads Scorecard is attached which reflects our understanding of the project intent and potential achievement level in Greenroads. A minimum of 32 points is required for a certification award for eligible projects.

The highlights of the Scorecard are summarized in the following table (shown in total points) and described below:

| Credit Type | Intent Present | Minimum | Maximum |
|---------------------------------------|----------------|---------|---------|
| Project Requirements | 1 | 11 | 11 |
| Documented | 3 | | |
| Incomplete | 8* | | |
| Possible Voluntary Credits | 93 | 93 | 93 |
| Documented | 10 | 10 | 10 |
| Practical Additions | 25 | 0 | 25 |
| High Effort Additions | 58 | 0 | 58 |
| Not Possible Voluntary Credits | 15 | 15 | 15 |
| Out of Context Credits | 13 | | |
| Partial Point Credits | 2 | | |
| Custom Credits | 10 | 0 | 10 |
| Identified As Possible | 0 | | |
| Not Attempted | 10 | | |

| Score* | Award Level | Score |
|--------------------------|-------------|-------|
| Documented Score | None | 10 |
| Practical Score | Bronze | 35 |
| High Effort Score | Evergreen | 93 |

*All 11 Project Requirements must be completed and documented to qualify for certification award.

- The Project has demonstrated intent to meet **3 of the 11 Project Requirements**. The Project has been rated very early in project development and it is common to be missing these items due to lack of available documentation.
- A total of **15 points do not appear to be practical** for the Project to achieve due to the nature of the project or because design choices have already been made that preclude their inclusion (and would therefore probably be considered inappropriate design choices).

- The Project has demonstrated intent to meet **4 Voluntary Credits totaling 10 points**, with additional points possible for one of these credits, described below. This number of points does not meet the minimum requirements for certification as presented to Greenroads at this time. This score is typical of projects rated early in project development.
- **Ten credits worth up to 25 total points were identified as practical and economical opportunities** given the scope and context of the project. These credits are potentially feasible based on the documents provided and are possible to implement with minimal additional construction cost or design team effort. These credits are in boldface in the scorecard. *Some of these activities may be on track to be performed on the project, but this was not immediately clear in the documentation for this limited assessment or in discussions with the Project Team.*
- **Twenty-one credits were identified as opportunities for the project to earn an additional 58 points**; however, the majority of these activities are likely to add substantial cost to the project or require significant scope changes due to the project's current status. These activities could be considered on future similar projects by integrating them into decision-making and project scoping early in project development. Credits for which the practicality was not able to be determined are also included in this group.
- **All 10 points in the Custom Credits category are also potentially available to the project.** No Custom Credits were identified for this project. There may be innovative sustainability practices performed on this project that have not been identified at this stage. Six Custom Credits have been fully developed and are available for potential implementation. These credits can be viewed on the Greenroads Website and could easily be considered on this Project due to its current lifecycle stage.

POTENTIAL FOR CERTIFICATION

The Peka Peka to Otaki Expressway project serves as starting benchmark project for the New Zealand Transport Agency to identify what further analysis needs to be completed for the Pilot Program, prior to potential institution of the Greenroads Project Certification Program locally.

Eligibility

Based our understanding of the intent of the Project Team, **it appears that the Peka Peka to Otaki Expressway Project could achieve a rating of Greenroads Bronze with minimal additional effort by the Project Team and by completing all of the Project Requirements.** The Project does not meet the explicit eligibility requirements for the Greenroads Certification Program since certification currently does not apply outside of the United States. However, this is a technicality that is anticipated to be resolved upon completion of the International Pilot Program for New Zealand; the Project would be eligible for certification in the future.

Relative Performance

The Peka Peka to Otaki Expressway project currently scores below average compared to other typical projects, but this is mostly because little information is presently available for the majority of Greenroads practices. Our data for 120 projects in North America built in the last 10 years suggest that most Projects complete an average of 7 Project Requirements and earn about 26 points in Voluntary Credits.

- Revisiting this Project for an updated A-Lined Assessment later on in project development may be helpful to provide a better measure of potential.

Reasonable Potential

This scorecard shows that with minimal additional effort, a Greenroads Bronze rating could be a reasonable project goal through the completion and documentation of about nine additional credit activities for 23 additional points and the remaining Project Requirements. The permeable pavement and cool pavement credits were identified as minimal effort credits. Appendix I: Economic Analysis of Pavement Design Options shows that all of the potential paving options are topped with 30mm of OGPA, which we believe may qualify as a permeable pavement. This would need to be confirmed with further documentation. Higher ratings appear to be possible, but could be challenging considering the scope and context of the project as well as local policy and other unknowns.

Positioning for Success

Based on its current lifecycle stage, the Project can be well-positioned for success if Greenroads Project Requirements and Voluntary Credits continue to be integrated into the Project through the end of construction. It should be noted that successful certification is often easily achievable when Greenroads is considered during project development and Greenroads-oriented specifications are used in contract documents. For this Project, many of the credits can likely still be pursued and a high score achieved if all of the Project Requirements can be achieved. In summary, there is a large opportunity to make choices that have future implications on the overall sustainability of the project as measured by Greenroads.

Adaptation Needs

The compatibility of the current Greenroads credits with laws and practices in New Zealand is still unknown. The Greenroads Rating System was developed based on standards and regulations in the United States and it is not recommended that the current standard is applied internationally without careful consideration or adaptation to fit the local context. The results of this A-Lined Assessment do not provide enough information to determine how or if modifications to existing Greenroads credits are warranted. As noted previously, this is mostly the result of missing final design and construction documentation.

Importantly, potential local constraints or obstacles for meeting the Project Requirements are not able to be identified at this time. A Detailed Pilot Project Assessment would help to answer these outstanding questions, but this type of Assessment is not ideally suited for the Peka Peka to Otaki Expressway Project due to lack of available as-built design and construction documentation.

It is unlikely, if Greenroads were to be adapted for application to projects in New Zealand, that the 11 current Project Requirements would be changed substantially from their stated goals and requirements except to integrate references to local regulations and standards. This means completing the Project Requirements may be more challenging for projects in New Zealand and may require additional effort to achieve.

Project documentation and discussions suggest that some Project Requirements may not be achievable or are not intended to be achieved. **We strongly recommend that if certification is a Project goal, each of the 11 Project Requirements are fully addressed before final design is complete to best position the project for success later.** We also recommend that the Peka Peka to Otaki Expressway Project further monitors its progress and eligibility status throughout design and construction, which can be achieved by communicating regularly with Greenroads staff and staying abreast of the latest developments in the New Zealand Pilot Program.

RECOMMENDATIONS FOR FUTURE PROJECTS

The Peka Peka to Otaki Expressway is a good example of how early project decision-making that considers sustainability can influence the overall outcome of the final project.

Below are some specific recommendations for the Project Team:

1. We strongly recommend that the 11 Greenroads Project Requirements are addressed early in project planning and design. Incorporating Project Requirements PR-4 through PR-7 into the specifications and technical drawings is an excellent way to ensure that they will be completed by the contractor. In general, once these documents or templates are generated, they may be able to be used again on future Greenroads projects with minimal to no changes.
2. For most projects, often the greatest potential to earn points involves considering stormwater management beyond completion of construction. For this project, it appears that some effort will be made to improve Runoff Quality and Runoff Flow Control, but we cannot determine if this effort will meet the requirements of EW-2 and EW-3 until the actual design documents are available and adaptation of Greenroads for New Zealand is complete. Generally, the Environment & Water category offers a huge potential for reducing environmental impacts over the life of roadway projects.

3. The Project appears to score the most points in the Access & Equity category, as these items are usually determined early in the planning period. It does however appear that further effort could earn additional points. Documents suggest that much will be done to preserve historic and cultural site near the project, which could likely achieve the AE-9 Cultural Outreach credit with little effort.
4. Another area of potential improvement is in project lighting. This Assessment could not determine if anything is being done on this project to use energy efficient and/or low light pollution lighting fixtures. In the United States this often offers potential gains, typically at low cost either for initial construction or lifecycle costs. This may not be as easy in New Zealand, so additional information would be needed to determine what types of technology are practical. This could be an easy way to earn additional points that typically pays back within a few years of the initial investment and installation.
5. Credits in the Construction Activities category are all marked as possible right now, as it could not be determined if any of these activities would be performed during construction. Many of these credits can be easily specified through special provisions or, sometimes, by creative financial incentives for contractors bidding on the project.
6. Finally, other innovative ideas could provide additional points and there are also existing Custom Credits that should be reviewed for additional ideas. A sample of Custom Credit ideas on record with Greenroads are listed in the latest version of the Errata for the *Greenroads Manual*. T. These credits are not available in the 2011 version of the *Manual* and must be viewed on the Greenroads Website.

APPENDIX A

About the Greenroads Rating System

ABOUT GREENROADS

This section details the Greenroads Rating System, including a brief background on development of the system, the operating definition of sustainability used, and a brief description of how it works and can be implemented. More detailed information, including the Version 1.5 *Greenroads Manual* (Muench et. al, 2011) can be found on the Greenroads website: <http://www.greenroads.org>.

BACKGROUND

Greenroads is a collection of sustainability best practices that apply to roadway design and construction, much like the Leadership in Energy and Environmental Design (LEED) Rating System for Buildings that is administered by the United States Green Building Council (USGBC). In general, these sustainability best practices are divided into two types: required and voluntary. There is currently one required category with 11 required best practices called “Project Requirements” or PRs. At minimum, all of these best practices must be completed in order for a roadway to be considered a Greenroad.

Projects that register using the Greenroads website with Greenroads Foundation are eligible to earn a certification award and will be able to display the Greenroads logo on their project to recognize their achievement.

What is a Greenroad?

A Greenroad is defined as roadway project that has been designed and constructed to a level of sustainability that is substantially higher than current common practice.

What is Sustainability?

Sustainability is the characteristic of a system that represents its capacity to support natural laws and human values. (Anderson, 2008; Muench et. al, 2011)

STRUCTURE OF THE RATING SYSTEM

In general, the Greenroads sustainability best practices are divided into two types: required and voluntary. There is currently one required category with 11 required best practices called “Project Requirements” or PRs. At minimum, all of these best practices must be completed in order for a roadway to be considered a Greenroad. Thirty-seven (37) other voluntary best practices are characterized in five additional categories, called “voluntary credits” or VCs. After the PR requirements have been met, a number of different VCs may be achieved and points may be earned toward one of four ratings: Certified, Silver, Gold and Evergreen. Additionally, a sixth VC category is available to projects that demonstrate and implement innovative ideas or more sustainable practices and would like to write or submit their own customized or new ideas for points.

Following is a brief description of the seven categories in Greenroads.

Project Requirements

This category contains all 11 Project Requirements (PR) that a Greenroads project must meet in order to be considered for a certification level award. The general intent of this category is to encourage environmentally responsible decision-making processes and to have management plans in place for construction, and to establish a minimum baseline for every project that applies for certification.

Environment & Water (EW)

This category contains eight (8) voluntary credits worth up to 21 points. The intent of this category is to promote best practices related to stormwater management and ecological resources within the project boundary.

Access & Equity (AE)

This category contains nine (9) voluntary credits worth up to 30 points. The intent of this category is to promote safety, access, and mobility to users of the roadway.

Construction Activities (CA)

This category contains eight (8) voluntary credits worth up to 14 points. The intent of this category is to promote responsible construction management, reduce use of fossil fuels and improve health and safety of construction workers.

Materials & Resources (MR)

This category contains six (6) voluntary credits worth up to 23 points. The intent of this category is to promote responsible materials and energy management by combinations of recycling, reusing and reducing both virgin and waste materials.

Pavement Technologies (PT)

This category contains six (6) voluntary credits worth up to 20 points. The intent of this category is to highlight specific pavement engineering innovations and ideas or broad types of technologies or techniques which are well-established in practice and have direct sustainability benefits.

Custom Credits (CC)

This category contains up to 10 credits which may be earned by a project that implements sustainable or innovative ideas. The project team may submit applications with a detailed description and explanation of the practice to earn credits in this category ranging in value from 1 to 5 points. Points awarded for the custom credit are determined through review and collaboration with Greenroads representatives. There is currently no limit established for how many custom credits a project may submit for review.

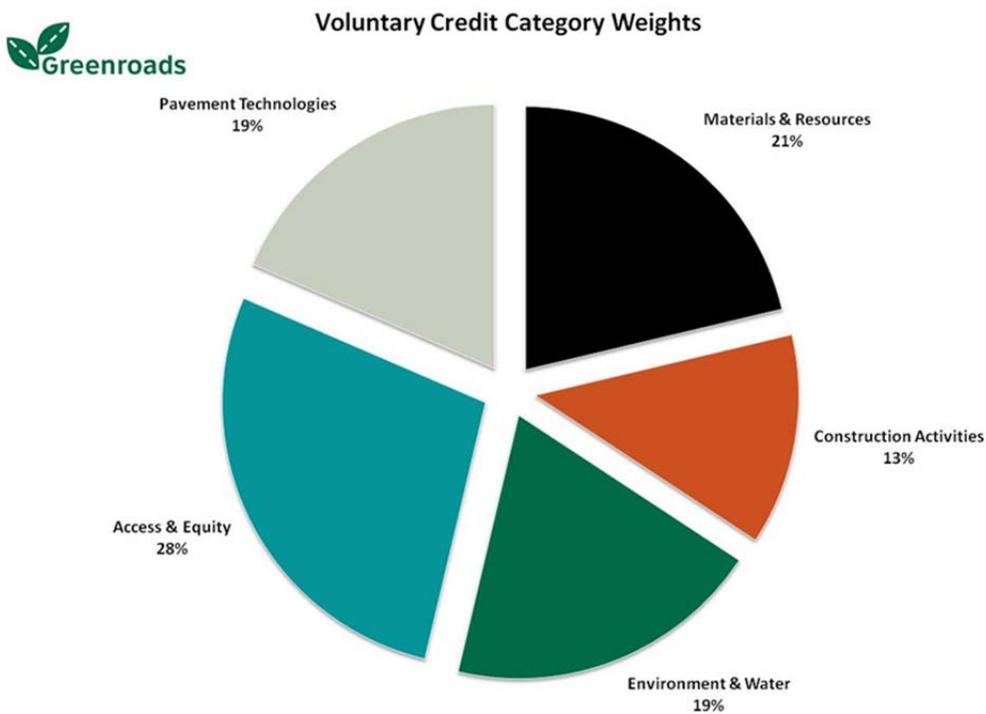


Figure A.1. Relative Weights of Greenroads VC Categories (Muench et al. 2010)



GREENROADS RATING SYSTEM

LIST OF CREDITS (v1.5)

| No. | Title | Pts. | Description |
|--|--|------------|---|
| Project Requirements (PR) – Mandatory for all projects | | | |
| PR-1 | Environmental Review Process | Req | Complete a comprehensive environmental review |
| PR-2 | Lifecycle Cost Analysis (LCCA) | Req | Perform LCCA for pavement/bridge section |
| PR-3 | Lifecycle Inventory (LCI) | Req | Perform LCI of pavement/bridge materials |
| PR-4 | Quality Control Plan | Req | Have a formal contractor quality control plan |
| PR-5 | Noise Mitigation Plan | Req | Have a construction noise mitigation plan |
| PR-6 | Waste Management Plan | Req | Have a plan to divert C&D waste from landfill |
| PR-7 | Pollution Prevention Plan | Req | Have a TESC/SWPPP |
| PR-8 | Low Impact Development (LID) | Req | Complete a LID feasibility study |
| PR-9 | Pavement Management System | Req | Have a pavement/bridge management system |
| PR-10 | Site Maintenance Plan | Req | Have a roadside maintenance plan |
| PR-11 | Educational Outreach | Req | Publicize sustainability information for project |
| Environment & Water (EW) – Up to 21 Points | | | |
| EW-1 | Environmental Management System | 2 | ISO 14001 certification for general contractor |
| EW-2 | Runoff Flow Control | 1-3 | Reduce runoff quantity |
| EW-3 | Runoff Quality | 1-3 | Treat stormwater to a higher level of quality |
| EW-4 | Stormwater Cost Analysis | 1 | Conduct an LCCA for stormwater elements |
| EW-5 | Site Vegetation | 1-3 | Use native low/no water vegetation |
| EW-6 | Habitat Restoration | 3 | Restore habitat beyond what is required |
| EW-7 | Ecological Connectivity | 1 or 3 | Connect habitat across roadways |
| EW-8 | Light Pollution | 3 | Discourage light pollution |
| Access & Equity (AE) – Up to 30 Points | | | |
| AE-1 | Safety Audit | 1-2 | Perform roadway safety audit |
| AE-2 | Intelligent Transportation Systems (ITS) | 2-5 | Implement ITS solutions |
| AE-3 | Context Sensitive Solutions | 5 | Plan for context sensitive solutions |
| AE-4 | Traffic Emissions Reduction | 5 | Reduce emissions with quantifiable methods |
| AE-5 | Pedestrian Access | 1-2 | Provide/improve pedestrian accessibility |
| AE-6 | Bicycle Access | 1-2 | Provide/improve bicycle accessibility |
| AE-7 | Transit Access | 1-5 | Provide/improve transit accessibility |
| AE-8 | Scenic Views | 1-2 | Provide views of scenery or vistas |
| AE-9 | Cultural Outreach | 1-2 | Promote art/culture/community values |
| Construction Activities (CA) – Up to 14 Points | | | |
| CA-1 | Quality Management System | 2 | ISO 9001 certification for general contractor |
| CA-2 | Environmental Training | 1 | Provide environmental training |
| CA-3 | Site Recycling Plan | 1 | Have a plan to divert waste from landfill |
| CA-4 | Fossil Fuel Reduction | 1-2 | Use alternative fuels in construction equipment |
| CA-5 | Equipment Emissions Reduction | 1-2 | Meet EPA Tier 4 standards for non-road equip. |
| CA-6 | Paving Emissions Reduction | 1 | Use pavers that meet NIOSH requirements |
| CA-7 | Water Tracking | 2 | Develop data on water use in construction |
| CA-8 | Contractor Warranty | 3 | Warranty on the constructed pavement |
| Materials & Resources (MR) – Up to 23 Points | | | |
| MR-1 | Life Cycle Assessment (LCA) | 2 | Conduct a detailed LCA of the entire project |
| MR-2 | Pavement Reuse | 1-5 | Reuse existing pavement sections |
| MR-3 | Earthwork Balance | 1 | Use native soil rather than import fill |
| MR-4 | Recycled Materials | 1-5 | Use recycled materials for new pavement |
| MR-5 | Regional Materials | 1-5 | Use regional materials to reduce transportation |
| MR-6 | Energy Efficiency | 1-5 | Improve energy efficiency of operational systems |
| Pavement Technologies (PT) – Up to 20 Points | | | |
| PT-1 | Long-Life Pavement | 5 | Design pavements for long-life |
| PT-2 | Permeable Pavement | 3 | Use permeable pavement as a LID technique |
| PT-3 | Warm Mix Asphalt (WMA) | 3 | Reduce production energy at plant for binders |
| PT-4 | Cool Pavement | 5 | Contribute less to urban heat island effect (UHI) |
| PT-5 | Quiet Pavement | 3 | Use a quiet pavement to reduce noise |
| PT-6 | Pavement Performance Tracking | 1 | Relate construction to performance data |
| Custom Credits (CC) – Available for all projects based on context and innovation, subject to approval | | | |
| CC-1 | Custom Credit 1 | 1-5 | Design a new voluntary credit |
| CC-2 | Custom Credit 2 | 1-5 | Design a new voluntary credit |
| Greenroads Total Points: | | 118 | |

APPENDIX B

Greenroads Scorecard



Project Name
Location (City, State)
Project Manager
Project Budget
Current Status (Circle)

12NZ00002 Peka Peka to Otaki Expressway
 Otaki, New Zealand
 Mike Sammons
 251.0 million (NZD)
 Planning Design Construction Complete

Project Requirements (PR) PR Max: 11 3 8 0

| No. | Title | | Y | ? | N |
|-------|------------------------------|-----|---|---|---|
| PR-1 | Environmental Review Process | Req | x | | |
| PR-2 | Lifecycle Cost Analysis | Req | x | | |
| PR-3 | Lifecycle Inventory | Req | | x | |
| PR-4 | Quality Control Plan | Req | | x | |
| PR-5 | Noise Mitigation Plan | Req | | x | |
| PR-6 | Waste Management Plan | Req | | x | |
| PR-7 | Pollution Prevention Plan | Req | | x | |
| PR-8 | Low-Impact Development | Req | x | | |
| PR-9 | Pavement Management System | Req | | x | |
| PR-1 | Site Maintenance Plan | Req | | x | |
| PR-11 | Educational Outreach | Req | | x | |

Environment & Water (EW) EW Max: 21 0 18 3

| No. | Title | | Y | ? | N |
|------|---------------------------------|-------|---|---|---|
| EW-1 | Environmental Management System | 2 | | 2 | |
| EW-2 | Runoff Flow Control | 1 - 3 | | 3 | |
| EW-3 | Runoff Quality | 1 - 3 | | 3 | |
| EW-4 | Stormwater Cost Analysis | 1 | | 1 | |
| EW-5 | Site Vegetation | 1 - 3 | | 3 | |
| EW-6 | Habitat Restoration | 3 | | 3 | |
| EW-7 | Ecological Connectivity | 1 - 3 | | | 3 |
| EW-8 | Light Pollution | 3 | | 3 | |

Access & Equity (AE) AE Subtotal: 30 10 13 7

| No. | Title | | Y | ? | N |
|------|------------------------------------|-------|---|---|---|
| AE-1 | Safety Audit | 1 - 2 | | 2 | |
| AE-2 | Intelligent Transportation Systems | 2 - 5 | | 5 | |
| AE-3 | Context Sensitive Solutions | 5 | 5 | | |
| AE-4 | Traffic Emissions Reduction | 5 | | | 5 |
| AE-5 | Pedestrian Access | 1 - 2 | 2 | | |
| AE-6 | Bicycle Access | 1 - 2 | 2 | | |
| AE-7 | Transit & HOV Access | 1 - 5 | 1 | 2 | 2 |
| AE-8 | Scenic Views | 2 | | 2 | |
| AE-9 | Cultural Outreach | 1 - 2 | | 2 | |

Construction Activities (CA) CA Max: 14 0 14 0

| No. | Title | | Y | ? | N |
|------|------------------------------|-------|---|---|---|
| CA-1 | Quality Management System | 2 | | 2 | |
| CA-2 | Environmental Training | 1 | | 1 | |
| CA-3 | Site Recycling Plan | 1 | | 1 | |
| CA-4 | Fossil Fuel Reduction | 1 - 2 | | 2 | |
| CA-5 | Equipment Emission Reduction | 1 - 2 | | 2 | |
| CA-6 | Paving Emission Reduction | 1 | | 1 | |
| CA-7 | Water Use Tracking | 2 | | 2 | |
| CA-8 | Contractor Warranty | 3 | | 3 | |

Materials & Resources (MR) MR Max: 23 0 18 5

| No. | Title | | Y | ? | N |
|------|----------------------|-------|---|---|---|
| MR-1 | Lifecycle Assessment | 2 | | 2 | |
| MR-2 | Pavement Reuse | 4 - 5 | | | 5 |
| MR-3 | Earthwork Balance | 1 | | 1 | |
| MR-4 | Recycled Materials | 1 - 5 | | 5 | |
| MR-5 | Regional Materials | 1 - 5 | | 5 | |
| MR-6 | Energy Efficiency | 5 | | 5 | |

Pavement Technologies (PT) PT Max: 20 0 20 0

| No. | Title | | Y | ? | N |
|------|-------------------------------|-------|---|---|---|
| PT-1 | Long-Life Pavement | 5 | | 5 | |
| PT-2 | Permeable Pavement | 3 | | 3 | |
| PT-3 | Warm Mix Asphalt | 3 | | 3 | |
| PT-4 | Cool Pavement | 5 | | 5 | |
| PT-5 | Quiet Pavement | 2 - 3 | | 3 | |
| PT-6 | Pavement Performance Tracking | 1 | | 1 | |

Custom Credit (CC) CC Max: 10 0 0 10

| No. | Title | | Y | ? | N |
|------|-------|-------|---|---|---|
| CC-1 | | 1 | | | |
| CC-2 | | 1 - 5 | | | |
| CC-3 | | 1 - 5 | | | |

| | |
|-----------------------------------|----------|
| All 11 PR Met? | No |
| Greenroads Total (Max 118) | 10 83 25 |