



Sports Surface
Design & Management
SPECIALIST TURF CONSULTANCY SERVICES

ROTORUA
LAKES COUNCIL
Te kaunihera o ngā roto o Rotorua



Report to Rotorua Lakes Council

Sports Field Construction Quality Assessments

August 2018





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1. Project Background

1.1 General

Sports Surface Design & Management (SSDM) were commissioned by Rotorua Lakes Council (RLC) to carry out a study of 35 sports field platforms over 15 soil-based sports parks and 1 sand carpet sports field (Rotorua International Stadium) to better understand the carrying capacity of these fields in order to determine surplus or shortfalls in sports field capacity.

Once the current carrying capacity has been estimated, data gathered will assist Council by feeding into a demand/supply of sports fields study being carried out across the Rotorua region.

Using SSDM's proprietary sports field construction quality assessment system, construction quality assessments of the fields have been carried out in order to capture information on soil properties and other physical attributes including surface shape and existing infrastructure, to create a grading of each field in regards to construction quality.

Currently all sports fields are unirrigated soil field fields with the exception of Rotorua International Stadium which is an irrigated sand carpet sports field.

1.2 Scope

The scope of work carried out for the preparation of this report has involved:

- Carrying out a construction quality assessment of each field/platform
- Carrying out a soil and basic levels assessment of each field
- Inclusion of anecdotal knowledge of each sports field or platform
- Comment on current carrying capacity
- Comment on upgrade potential or risks
- High level costings to provide short term or long term solutions to improve capacity on each field/platform

1.3 Assessment methods

Table 1 below summarises the different methods used to complete the report. The method used to grade each field was by using SSDM's Soil Construction Quality Assessment System, details of which are given in Appendix 1.



TABLE 1
Summary of field and desktop methods used for field assessment

ITEM	DESCRIPTION
Soil and drainage classification via soil maps	SSDM used Landcare Research S-map online to summarise local soil conditions and drainage characteristics comparing with on-site observations.
Information on existing drainage infrastructure	Information of existing drainage and irrigation infrastructure, together with anecdotal information provided by RLC.
Field construction quality assessment	Field construction quality assessments were carried out on site using SSDM's Sports Field Construction Quality Assessment System. Further details of this system are given in Appendix 1 with individual reports in Appendix 2.
Levels assessment	Assessment of surface levels and field shape were visually carried out together with the use of Council Lidar information.



2. Soils Investigation

2.1 Soil types and depths

Generally most of the parks assessed have a layer of healthy volcanic topsoil measuring between 150-200mm above varying subsoils across the region and in some cases across the park. Sub soils ranged from free draining pumice sands to Allophanic silts and some peat soils. Generally there were a wide range of subsoils across the region, some of which ultimately limits the drainage performance of the sports fields, others had free draining pumice in parts of the park which provides excellent drainage. A high water table was found between 0.8-1.m deep in a number of locations.

Most of the parks assessed showed the soil profile to be in an undisturbed, natural state, with the exception of a number of cut and fill engineered platforms, such as Puketewhero and Westbrook Park.

Some other site and soil exceptions exist within the region, namely;

- Marist St Michaels which is understood to have been built on a section of ex-commercial land and areas with debris found in test locations.
- Neil Hunt Park which has been built over an old sawmill where logs, sawdust and other organic material remain on site causing disruption to levels due to differential settlement.

TABLE 2
Soil and drainage classification according to Landcare research soil maps

PARK	SOIL FAMILY	SOIL CLASIFCATION	DRAINAGE CLASSIFCATION*	SSDM NOTES
Jessie Martin Park	Ngakura	Orthic Allophanic soil	Well drained	Free draining pumice sand subsoil
Kuirau Park	Ngakura	Orthic Allophanic soil	Well drained	Peaty subsoil
Linton Park	Ngakura	Orthic Allophanic soil	Well drained	Free draining pumice sand subsoil
Marist St Michaels	Tikitere	Inactive Hydrothermal Recent soil	Well drained	Constructed on imported soils
Medical Officer's Reserve	Ngakura	Orthic Allophanic soil	Well drained	Variable subsoil- ranging from sandy to peaty



Neil Hunt Park- Rugby	Tikitere	Inactive Hydrothermal Recent soil	Well drained	Some areas built on old sawmill with settlement evident
Neil Hunt Park- Football	Makiekie	Immature Orthic Pumice Soil	Well drained	Variable subsoil conditions- settlement evident on northern fields
Ngongotaha Domain	Matata	Mottled Tephric Recent Soil	Imperfectly drained	Sports fields built over free draining pumice sand subsoil
Puarenga Park	Tikiere	Inactive Hydrothermal Recent soil	Well drained	Area of park built on landfill- variable subsoils throughout park- poor draining
Puketawhero Park	Makiekie	Immature Orthic Pumice Soil	Well drained	Pumice silt loam subsoil
Ray Boord Reserve	Ngakura	Orthic Allophanic soil	Well drained	Variable subsoils ranging from pumice silts to pumice sands
Rotorua International Stadium	Ngakura	Orthic Allophanic soil	Well drained	Variable subsoils ranging from pumice silts to pumice sands on No.2 field
Rowi Reserve	Ngakura	Orthic Allophanic soil	Well drained	Variable subsoils ranging from pumice silts to pumice sands
Tamarahi Reserve	Ngakura	Orthic Allophanic soil	Well drained	Pumice silt loam subsoil
Waikite Park No.1	Ngakura	Orthic Allophanic soil	Well drained	Pumice sand subsoil
Waikite Park No.2	Windermere	Mellow Humic Organic soil	Poorly drained	Part of field built over area of peat with high water table
Westbrook Reserve	Ngakura	Orthic Allophanic soil	Well drained	Pumice silt loam subsoil

Soils observed through site investigations generally matched & were consistent with the soils described above.

* S-map drainage classification of 'well drained' would generally be considered poor for sports field use, as drainage from these maps is considered in an agricultural situation rather than a sports field which has a much higher performance expectation than agricultural land.



3. Field Condition Assessment Summary

Table 3 summarises the results of the construction quality assessments. Individual reports are shown in Appendix 2 – Individual field construction quality assessment results.

The majority of fields were graded overall as Below Average Quality based on current conditions. A major contributing factor to this result was the absence of any drainage or irrigation infrastructure and an apparent lack of physical treatments. See Section 4, Table 11 for recommended upgrades to improve overall grades.

TABLE 3
Construction audit summary- graded from best to worst

Park	Inherent profile properties	Upgrading/ renewing potential	Current upgraded status and profile management	Surface levels and surrounds	overall grade	Description	Code
Rotorua International stadium No.1	Sand carpet-uses different criteria				3		
Linton Park 1	1	2	5	3	3	Average Quality	Football
Ngongotaha 1	1	1	5	4	3	Average Quality	Rugby
Puketawhero Park 2	1	2	5	3	3	Average Quality	Rugby League
Puketawhero Park 3	1	2	5	3	3	Average Quality	Rugby League
Puketawhero Park 5	1	2	5	3	3	Average Quality	Rugby League
Tamarahi Reserve	3	1	5	2	3	Average Quality	Football
Jessie Martin Park	1	3	5	3	4	Below Average Quality	Football
Medical Officer's reserve	3	2	5	4	4	Below Average Quality	Training
Medical Officer's reserve	3	1	5	3	4	Below Average Quality	Training
Puketawhero Park 1	2	2	5	4	4	Below Average Quality	Rugby League
Puketawhero Park 4	3	2	5	3	4	Below Average Quality	Rugby League
Puketawhero Park 6	2	2	5	3	4	Below Average Quality	Rugby League
Rotorua International Stadium 2	3	3	5	3	4	Below Average Quality	Multi
Rowi Reserve	3	2	5	3	4	Below Average Quality	Football
Waikite Sports 1	2	3	5	4	4	Below Average Quality	Rugby
Westbrook Reserve 1&2	2	3	5	2	4	Below Average Quality	Rugby
Westbrook Reserve 3&4	2	3	5	3	4	Below Average Quality	Rugby
Kuirau Park	3	2	5	4	5	Low Quality	Rugby
Neil Hunt Park 1	2	4	5	4	5	Low Quality	Rugby
Puarenga Park 1	3	1	5	4	5	Low Quality	Rugby
Waikite Sports 2	4	2	5	4	5	Low Quality	Rugby
Linton Park 2	3	4	5	3	0	Unacceptable quality	Football
Marist St Michaels	4	5	5	2	0	Unacceptable quality	Rugby



Neil Hunt Park 2	3	4	5	4	0	Unacceptable quality	Rugby
Neil Hunt Park 3	4	5	5	4	0	Unacceptable quality	Football
Neil Hunt Park 4	4	5	5	5	0	Unacceptable quality	Football
Neil Hunt Park 5	2	4	5	5	0	Unacceptable quality	Football
Ngongotaha 2	3	5	5	4	0	Unacceptable quality	N/A
Puarenga Park 2	4	3	5	4	0	Unacceptable quality	Rugby
Puarenga Park 3	4	3	5	5	0	Unacceptable quality	Football
Puarenga Park 4	3	4	5	5	0	Unacceptable quality	Football
Puarenga Park 5	4	3	5	5	0	Unacceptable quality	Football- jr
Ray Boord Reserve No.1&2 ^	Sand carpet-uses different criteria				0	Unacceptable quality	Football
Ray Boord Reserve No.3&4	3	4	5	3	0	Unacceptable quality	Football- jr

1= High Quality 2= Above Average Quality 3= Average Quality 4= Below Average Quality 5= Low Quality 0= Unacceptable Quality

- Ray Boord Reserve No.1&2 has been assessed as a sand carpet sports field as slit drains were installed into the field perpendicular to the lateral drains over the summer of 2017/18.



TABLE 4
Soil Construction quality grade carrying capacity

CONSTRUCTION QUALITY GRADE	GRADE DESCRIPTION	EXPECTED CARRYING CAPACITY* (HOURS/WEEK)
1	HQ= High Quality	Up to 15
2	AAQ= Above Average Quality	Up to 12.5
3	AQ= Average Quality	Up to 10
4	BAQ= Below Average Quality	Up to 5
5	LQ= Low Quality	Up to 2.5
0	UQ= Unacceptable Quality	Up to 1.5

* Continued use of the fields over the expected carrying capacity could be detrimental to and damage the surface quality of the sports field.

TABLE 5
Sand carpet construction quality grade carrying capacity

CONSTRUCTION QUALITY GRADE	GRADE DESCRIPTION	EXPECTED CARRYING CAPACITY* (HOURS/WEEK)
1	HQ= High Quality	Up to 25
2	AAQ= Above Average Quality	Up to 20
3	AQ= Average Quality	Up to 15
4	BAQ= Below Average Quality	Up to 10
5	LQ= Low Quality	Up to 5
0	UQ= Unacceptable Quality	Up to 2.5

* Continued use of the fields over the expected carrying capacity could be detrimental to and damage the surface quality of the sports field.

3.1 Particular upgrade considerations/challenges observed from assessments

Marist St Michaels

Built on poor quality topsoil with demolition and deleterious material throughout the profile.

Puarenga Park

Generally poorly draining and thermal activity causing turf loss in some areas of the park

Neil Hunt Park

Old lumber mill site with obvious areas of settlement and subsidence



Westbrook Reserve and Puketawhero Park

Both parks have been well built with good soils and surface shapes, increased physical inputs such as decompaction and aeration would improve these parks. Additionally the installation of irrigation and/or drainage would greatly improve these parks increasing the grade and capacity considerably.

3.2 Summary of grading for each sporting code

Tables 6-10 list the total number of sports turf fields provided by RLC in each of the 3 codes and multi- use facilities and existing construction quality grade of each Park.

TABLE 6
Football fields

Park	Grade	Comment
Linton Park 1	3	Drained
Tamarahi Reserve	3	Good shape
Jessie Martin Park	4	Free draining subsoil
Rowi Reserve	4	
Linton Park 2	0	
Neil Hunt Park 3	0	
Neil Hunt Park 4	0	
Neil Hunt Park 5	0	
Puarenga Park 3	0	
Puarenga Park 4	0	
Puarenga Park 5	0	Junior use
Ray Boord reserve No.1&2	0	Sand Carpet*
Ray Boord Reserve No.3&4	0	Junior use, mixed subsoil

* Slit and lateral drained only

TABLE 7
Rugby fields

Park	Grade	Comment
Ngongotaha 1	3	Free draining subsoil
Waikite Sports 1	4	Free draining subsoil
Westbrook 1&2	4	Good shape
Westbrook 3&4	4	
Kuirau Park	5	
Neil Hunt Park No.1	5	
Waikite Sports 2	5	
Puarenga Park 1	5	
Marist St Michaels	0	
Neil Hunt Park 2	0	
Puarenga Park 2	0	



TABLE 8
Rugby League fields

Park	Grade	Comment
Puketawhero Park 2	3	Good shape
Puketawhero Park 3	3	Good shape
Puketawhero Park 5	3	Good shape
Puketawhero Park 1	4	Good shape
Puketawhero Park 4	4	Good shape
Puketawhero Park 6	4	

TABLE 9
Multi use

Park	Grade	Comment
Rotorua International Stadium No.1	3	Sand carpet
Rotorua International Stadium No.2	4	Mixed subsoil
Ngongotaha Domain	0	Reserve

TABLE 10
Training

Park	Grade	Comment
Medical Officer's reserve No.1	4	
Medical Officer's reserve No.2	4	Close to SH 30A



4. Actions to raise carrying capacity.

The majority of sports fields received a grading of 0 or 5 indicating they are of poor quality and have low carrying capacities. This is generally due to the fact that either inadequate physical treatment has been carried out or no drainage or irrigation has been installed. Table 11 below outlines what would need to be carried out on each field/platform to raise the existing grading 1 or 2 points, therefore increasing the carrying capacity only. SSDM recommend that a full feasibility of each field be carried out prior to committing to any particular major capital investment.

TABLE 11
Recommended upgrades to increase grading

Park	Current Grading	Current carrying capacity	Recommended action(s)	New grading	New carrying capacity
Rotorua International stadium No.1	3	15	Increased lateral drainage to ≤10m centres	2	20
Linton Park 1	3	10	Increased aeration and de-compaction and installation of automatic irrigation system	2	12.5
Ngongotaha 1	3	10	Increased aeration and de-compaction and installation of automatic irrigation system	2	12.5
Puketawhero Park 2	3	10	Increased aeration and installation of a drainage and irrigation system	2	12.5
Puketawhero Park 3	3	10	Increased aeration and installation of a drainage and irrigation system	2	12.5
Puketawhero Park 5	3	10	Increased aeration and installation of drainage and irrigation system	2	12.5
Tamarahi Reserve	3	10	Increased aeration and de-compaction and installation of a drainage and irrigation system	2	12.5
Jessie Martin Park	4	5	Increased aeration and de-compaction	3	10
Medical Officer's reserve 1	4	5	Increased aeration and de-compaction and installation of either a drainage or irrigation system	3	10
Medical Officer's reserve 2	4	5	Increased aeration and de-compaction and installation of either a drainage or irrigation system	3	10
Puketawhero Park 1	4	5	Increased aeration and de-compaction and installation of either a drainage or irrigation system	3*	10
Puketawhero Park 4	4	5	Increased aeration and de-compaction and installation of either a drainage or irrigation system	3	10
Puketawhero Park 6	4	5	Increased aeration and de-compaction and installation of either a drainage or irrigation system	3	10
Rotorua International Stadium 2	4	5	Increased aeration and de-compaction and installation of either a drainage or irrigation system	3	10
Rowi Reserve	4	5	Increased aeration and de-compaction	3	10
Waikite Sports 1	4	5	Increased aeration and installation of irrigation system	3	10
Westbrook Reserve 1&2	4	5	Increased aeration and de-compaction	3	10
Westbrook Reserve	4	5	Increased aeration and de-compaction and	3	10



3&4			installation of either a drainage or irrigation system		
Kuirau Park	5	2.5	Increased aeration and installation of a drainage or irrigation system	4*	5
Neil Hunt Park 1	5	2.5	Increased aeration and installation of a drainage or irrigation system	4	5
Puarenga Park 1	5	2.5	Increased aeration and de-compaction	4^	5
Waikite Sports 2	5	2.5	Increased aeration and installation of a drainage or irrigation system	4	5
Linton Park 2	0	1.5	Increased aeration and de-compaction	5*	2.5
Marist St Michaels	0	1.5	Increased aeration and de-compaction	5*	2.5
Neil Hunt Park 2	0	1.5	Increased aeration	5*	2.5
Neil Hunt Park 3	0	1.5	Increased aeration and installation of a drainage and irrigation system	5	2.5
Neil Hunt Park 4	0	1.5	Increased aeration and installation of a drainage and irrigation system	5	2.5
Neil Hunt Park 5	0	1.5	Increased aeration	5*	2.5
Ngongotaha 2	0	1.5	Extensive re-levelling and installation of drainage or irrigation	5	2.5
Puarenga Park 2	0	1.5	Increased aeration and installation of a drainage or irrigation system	5	2.5
Puarenga Park 3	0	1.5	Increased aeration and installation of a drainage and irrigation system	5	2.5
Puarenga Park 4	0	1.5	Increased aeration and installation of a drainage and irrigation system	5	2.5
Puarenga Park 5	0	1.5	Increased aeration and installation of a drainage and irrigation system	5	2.5
Ray Boord Reserve No.1 ^	0	2.5	Installation of irrigation system	4	10
Ray Boord Reserve No.2	0	1.5	Increased aeration and installation of a drainage and irrigation system	5	2.5

* If both irrigation and drainage were installed, carrying capacity would increase 2 grades.

^ With the installation of an irrigation system or drainage system, carrying capacity would increase 2 grades.

4.1 Rotorua International Stadium

As part of the assessments, more specific testing was carried on the sand carpet field at the Rotorua International stadium comprising of an assessment of the existing sand carpet and a visual assessment of drainage systems, which is then used to create a Sand Carpet Construction Quality Assessment. Sand carpet contamination, organic matter accumulation and surface infiltration were also measured on Wednesday 22 August, 2018.

The percentage of fines contamination within the sand carpet was measured to be 16%. Less than 20% contamination within the sand carpet is considered to be clean.

Organic matter accumulation with the upper 75mm of the profile was an average of less than 6% which is in keeping with recommended levels (<6%).

Surface infiltration measured an average of 40mm/hr which is slightly below the typically recommended minimum of 50mm/hr for international venues.



4.2 Sports Field Lighting

It was noticed that most of the sports fields had some form of training lights installed. Prior to installing training lights on any sports ground, a number of points need to be considered prior to investment or in the ongoing management of the lights.

- What is the user demand? – club (team numbers, training requirement and existing useable space) or are the venues high profile community assets
- Are the sports field/training field/dedicated training areas capable of sustaining the level of use that will come with lighting – suitably drained and surfaced or can they be installed on sacrificial areas such as dedicated training pads? Or are the training areas currently on the playing surfaces?
- Are there existing lighting assets at the venue? If so, what state are they in – are they dangerous – do they meet public/RLC H& S requirements?
- If existing lights are club owned; would RLC consider a sign over in return for future upgrade and ongoing maintenance – in this situation Council then has control over the maintenance and therefore safe use of the systems and could develop modern activation/telemetry management and override of systems if weather/ground conditions are not suitable to prevent turf damage

4.3 Estimated costs

Assumptions have been made below in Table 12 on the approximate cost of each operation recommended to increase the carrying capacity of each sports field in Rotorua.

TABLE 12
Estimated Operation costs

Operation/per field	Estimated cost	Notes
De-compaction	\$1700/yr	Verti-draining (x2) cost per year
Aeration	\$2000/yr	Slicing or spiking (x3) cost per year
Re-levelling	\$35000	Includes grassing-1 off capital cost
Primary drainage installation	\$50000	Assumes outlet available- 1 off capital cost
Irrigation installation	\$50000	Excludes water connection and assumes boosting is not required- 1 off capital cost

Table 13 outlines the estimated costs to raise each sport field by 1 grade based on Table 11.

TABLE 13
Required upgrades

Field	Annual costs	Capital costs	Total/field	Notes
Rotorua International stadium No.1		\$50000	\$50000	
Linton Park 1	\$3700	\$50000	\$53700	
Ngongotaha 1	\$3700	\$50000	\$53700	
Puketawhero Park 2	\$2000	\$100000	\$102000	
Puketawhero Park 3	\$2000	\$100000	\$102000	
Puketawhero Park 5	\$2000	\$100000	\$102000	
Tamarahi Reserve	\$3700	\$100000	\$103700	
Jessie Martin Park	\$3700		\$3700	
Medical Officer's reserve 1	\$3700	\$50000	\$53700	



Medical Officer's reserve 2	\$3700	\$50000	\$53700	
Puketawhero Park 1	\$3700	\$50000	\$53700	
Puketawhero Park 4	\$3700	\$50000	\$53700	
Puketawhero Park 6	\$3700	\$50000	\$53700	
Rotorua International Stadium 2	\$3700	\$50000	\$53700	
Rowi Reserve	\$3700		\$3700	
Waikite Sports 1	\$2000	\$50000	\$52000	
Westbrook Reserve 1&2	\$3700		\$3700	
Westbrook Reserve 3&4	\$3700		\$3700	
Kuirau Park	\$2000	\$50000	\$52000	
Neil Hunt Park 1	\$2000	\$50000	\$52000	
Puarenga Park 1	\$3700		\$3700	
Ray Boord Reserve No.1 ^		\$50000	\$50000	Large increase in carrying capacity
Waikite Sports 2	\$2000	\$50000	\$52000	
Linton Park 2	\$3700		\$3700	Drainage would limit use
Marist St Michaels	\$3700		\$3700	Ground conditions may prevent de-compaction
Neil Hunt Park 2	\$2000		\$2000	
Neil Hunt Park 3	\$3700	\$100000	\$103700	Ground conditions may limit use and upgrade
Neil Hunt Park 4	\$3700	\$100000	\$103700	Ground conditions may limit use and upgrade
Neil Hunt Park 5	\$2000		\$2000	
Ngongotaha 2		\$325000	\$325000	Landfill- risk of future settlement
Puarenga Park 2	\$2000	\$50000	\$52000	Poor site
Puarenga Park 3	\$2000	\$100000	\$102000	Poor site
Puarenga Park 4	\$2000	\$100000	\$102000	Ex-landfill
Puarenga Park 5	\$2000	\$100000	\$102000	Poor site
Ray Boord Reserve No.2	\$2000	\$100000	\$102000	
Totals	\$94,600	\$2,025,000	\$2,119,600	



Appendix 1 – Sports field construction quality assessment system

SSDM’s Sports field construction quality assessment system was used to score the soil and construction quality characteristics of the fields. This system used four main characteristics that were considered to have the greatest influence on a sports field’s performance (Table A1). Each main characteristic was further split into several descriptive sub-characteristics with 0, 1 or 2 points allocated according to condition at the time of assessment.

TABLE A1
Main and sub-characteristics used to assess inherent soil and construction quality

Main characteristic			
Inherent profile properties	Upgrading/renewal potential	Current upgraded status and profile management	Surface levels and surrounds
Sub-characteristic ¹			
Topsoil texture	Current state of construction	Current profile de-compaction management	Uniformity of slope
Description of topsoil structure	Average topsoil depth	Current profile aeration management	Extent of slope
Topsoil smell and colour	Degree of settlement	Type of drainage system present	Run-off from surrounds
Subsoil condition	Ease of trenching	Type of irrigation system present	Boundary or hard surfaces
Presence of water table	-	-	-

¹ Each sub-characteristic was further sub-divided into three objective statements of quality linked to a points scoring system (0,1 or 2).

Points scored for each sub-characteristic were summed to give a total score for each main characteristic. This process was repeated for all four main characteristics to provide an overall score for each field. Not all main characteristics were given the same weighting, with ‘inherent profile properties’ contributing the most towards the overall score. Then, by expressing the points scored as a percentage of the total points available, each field was categorised into one of six grades and associated descriptive ratings (Table A2). Note that any sub-characteristic scoring zero points was automatically highlighted on the reports (Appendix 2) as a specific issue that would require following up or particular consideration should an upgrade take place in the future.

The assessment grade was calculated in a 1-5 format. Grade 1 represented a field of High Quality and 5 represented a field of Low Quality. A field which scored 0 meant it could be uneconomical to invest in physical renovations or upgrades because of numerous field limitations.



TABLE A2

Relationship between quality rating grade (1-5) and percentage of total quality rating points available

Overall grade	Numerical assignment	Description	Relationship to total quality rating points available
High quality (HQ)	1	Where the sports field meets stringent limits	No less than 90% of total points available
Above average quality (AAQ)	2	Where the limits are slightly relaxed against the high quality rating	No less than 80% of total points available
Average quality (AQ)	3	Where the limits of performance are typical of well-maintained and constructed fields	No less than 70% of total points available
Below average quality (BAQ)	4	Where the limits of performance are generally achieved within the industry but may have re-occurring issues	No less than 60% of total points available
Low quality (LQ)	5	Where the field meets certain specified limits but over a much wider range of performance or where the limits are on the border as being acceptable	No less than 50% of total points available
Unacceptable quality (UQ)	0	Where the field does not meet any limits and is therefore below acceptable quality levels but may still function as a sports field with limited use	Less than 40% of total points score available



Appendix 2 – Individual field construction quality assessment results

Soil and Construction Quality Report



Name of park: Jesse Martin Park
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	No decompaction treatment is ever carried out
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



Report system compiled for
 Rotorua Lakes Council
 Sports Surface Design and Management
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Soil and Construction Quality Report



Name of park: Kuirau Park
Field number: 1
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 5

Overall Quality Description Low Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

Field can perform well under good ground conditions but is highly susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A major drainage and infrastructure upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

Improved maintenance/physical treatment/irrigation may improve field quality



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Soil and Construction Quality Report



Name of park: Linton Park
Field number: 1
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 3

Overall Quality Description Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	No decompaction treatment is ever carried out
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	-
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

Existing soil conditions and infrastructure suggest that upgrade to accommodate increased usage is feasible

Interpretation of results in terms of drainage upgrade

A drainage upgrade would capitalise on the inherent field qualities and increase usage

Interpretation of results in terms of soil-based field quality

The field is in good overall condition although poor winter conditions limit use and prevent additional use



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Soil and Construction Quality Report



Name of park: Linton Park
Field number: 2
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	Water table found within the upper 0.5 m
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	No decompaction treatment is ever carried out
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Marist St Michaels
Field number: 1
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	Built on reclaimed land, landfill or tip site
Average depth of topsoil	-
Settlement	-
Ease of trenching	Buried stones or organic material limit trenching potential
Upgraded Status / Profile Management	
Profile decompaction	No decompaction treatment is ever carried out
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Medical Officers
Field number: 1
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Medical Officers
Field number: 2
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Neil Hunt Park
Field number: 1
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 5

Overall Quality Description Low Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

Field can perform well under good ground conditions but is highly susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A major drainage and infrastructure upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

Improved maintenance/physical treatment/irrigation may improve field quality



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Soil and Construction Quality Report



Name of park: Neil Hunt Park
Field number: 2
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	Localised depressions and / or subsidence clearly visible
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Neil Hunt Park
Field number: 3
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	Low levels of oxygen and prolonged periods of saturation
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	Built on reclaimed land, landfill or tip site
Average depth of topsoil	-
Settlement	Localised depressions and / or subsidence clearly visible
Ease of trenching	Buried stones or organic material limit trenching potential
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Neil Hunt Park
Field number: 4
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	Low levels of oxygen and prolonged periods of saturation
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	Built on reclaimed land, landfill or tip site
Average depth of topsoil	-
Settlement	Localised depressions and / or subsidence clearly visible
Ease of trenching	Buried stones or organic material limit trenching potential
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Neil Hunt Park
Field number: 5
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Ngongotaha Domain
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 3

Overall Quality Description Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

Existing soil conditions and infrastructure suggest that upgrade to accommodate increased usage is feasible

Interpretation of results in terms of drainage upgrade

A drainage upgrade would capitalise on the inherent field qualities and increase usage

Interpretation of results in terms of soil-based field quality

The field is in good overall condition although poor winter conditions limit use and prevent additional use



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Soil and Construction Quality Report



Name of park: Ngongotaha Domain
Field number: 2
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	Water table found within the upper 0.5 m
Upgrading / Renewing Potential	
Current state of construction	Built on reclaimed land, landfill or tip site
Average depth of topsoil	-
Settlement	Localised depressions and / or subsidence clearly visible
Ease of trenching	Buried stones or organic material limit trenching potential
Upgraded Status / Profile Management	
Profile decompaction	No decompaction treatment is ever carried out
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Puarenga Park
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 5

Overall Quality Description Low Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

Field can perform well under good ground conditions but is highly susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A major drainage and infrastructure upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

Improved maintenance/physical treatment/irrigation may improve field quality



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Soil and Construction Quality Report



Name of park: Puarenga Park
Field number: 2
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	Topsoil average depth less than 100 mm
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Puarenga Park
Field number: 3
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	-
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Puarenga Park
Field number: 4
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	Built on reclaimed land, landfill or tip site
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Puarenga Park
Field number: 5
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	Water table found within the upper 0.5 m
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations

Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical



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Soil and Construction Quality Report



Name of park: Puketawhero Park
Field number: 1
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Puketawhero
Field number: 2
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 3

Overall Quality Description Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	-

Interpretation of overall quality rating

Existing soil conditions and infrastructure suggest that upgrade to accommodate increased usage is feasible

Interpretation of results in terms of drainage upgrade

A drainage upgrade would capitalise on the inherent field qualities and increase usage

Interpretation of results in terms of soil-based field quality

The field is in good overall condition although poor winter conditions limit use and prevent additional use



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blair.cornthwaite@ssdm.co.nz



Soil and Construction Quality Report



Name of park: Puketawhero Park
Field number: 3
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 3

Overall Quality Description Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	-

Interpretation of overall quality rating

Existing soil conditions and infrastructure suggest that upgrade to accommodate increased usage is feasible

Interpretation of results in terms of drainage upgrade

A drainage upgrade would capitalise on the inherent field qualities and increase usage

Interpretation of results in terms of soil-based field quality

The field is in good overall condition although poor winter conditions limit use and prevent additional use



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Soil and Construction Quality Report



Name of park: Puketawhero Park
Field number: 4
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Puketawhero
Field number: 5
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 3

Overall Quality Description Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	-

Interpretation of overall quality rating

Existing soil conditions and infrastructure suggest that upgrade to accommodate increased usage is feasible

Interpretation of results in terms of drainage upgrade

A drainage upgrade would capitalise on the inherent field qualities and increase usage

Interpretation of results in terms of soil-based field quality

The field is in good overall condition although poor winter conditions limit use and prevent additional use



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Soil and Construction Quality Report



Name of park: Puketawhero Park
Field number: 6
Date of assessment: 7/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Ray Boord Park
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Comthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	-
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Ray Boord
Field number: 2
Date of assessment: 9/08/2018
Name of assessor: Blair Comthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 0

Overall Quality Description Unacceptable Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsail texture	-
Topsail structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	Water table found within the upper 0.5 m
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	The field receives significant run off from adjacent areas
Presence of hard surfaces	Hard surfaces within safety zone have no padding/barriers

Interpretation of overall quality rating

The field does not meet any of the quality limits and is below an acceptable standard for upgrading

Interpretation of results in terms of drainage upgrade

Upgrading drainage may not be viable, due to site limitations


Interpretation of results in terms of soil-based field quality

Further upgrades/enhanced management would probably be uneconomical




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SAND CARPET CONSTRUCTION QUALITY ASSESSMENT			
Client	Rotorua Lakes Council	Date tested	9/08/2018
Name	Ray Boord No.1	Job number	AG2569
Project	RLC Sports field Audits	Date of report	11/09/2018
Tested by	Blair Cornthwaite	Checked by	BC
Assessment Characteristic	Quality Rating Points	Quality Rating Grade (1-5)*	Quality Description*
Inherent profile properties	4	4	BAQ
Site & turf type	4	3	AQ
Irrigation & drainage	5	4	BAQ
Surface levels & surrounds	5	2	AAQ
Total points	18		
Maximum possible points	34		
Field quality rating value (%)	53		
Field quality description	LQ		
Interpretation of description	Low quality Where the field meets certain specified limits but over a much wider range of performance or where the limits are on the border as being acceptable		carrying capacity (Hours/week) 5
*			
1 = High Quality	HQ	High Quality	>90%
2 = Above Average Quality	AAQ	Above Average Quality	>80%
3 = Average Quality	AQ	Average Quality	>70%
4 = Below Average Quality	BAQ	Below Average Quality	>60%
5 = Low Quality	LQ	Low Quality	>50%
0= Unacceptable Quality	UQ	Unacceptable Quality	<50%
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SAND CARPET CONSTRUCTION QUALITY ASSESSMENT			
Client	Rotorua Lakes Council	Date tested	22/08/2018
Name	International Stadium	Job number	AG2569
Project	RLC Sports field Audits	Date of report	11/09/2018
Tested by	Blair Cornthwaite	Checked by	BC
Assessment Characteristic	Quality Rating Points	Quality Rating Grade (1-5)*	Quality Description*
Inherent profile properties	6	3	AQ
Site & turf type	6	2	AAQ
Irrigation & drainage	8	3	AQ
Surface levels & surrounds	6	1	HQ
Total points	26		
Maximum possible points	34		
Field quality rating value (%)	76		
Field quality description	AQ		
Interpretation of description	Average quality Where the limits of performance are typical of well maintained and constructed fields		carrying capacity (Hours/week)
			15
* 1 = High Quality HQ High Quality >90%			
2 = Above Average Quality AAQ Above Average Quality >80%			
3 = Average Quality AQ Average Quality >70%			
4 = Below Average Quality BAQ Below Average Quality >60%			
5 = Low Quality LQ Low Quality >50%			
0= Unacceptable Quality UQ Unacceptable Quality <50%			
 Sports Surface Design & Management <small>SPECIALIST TURF CONSULTANCY SERVICES</small>		Report compiled for Rotorua Lakes Council Sports Surface Design & Management blair.cornthwaite@ssdm.co.nz	



Soil and Construction Quality Report



Name of park: Rotorua International Stadium
Field number: 2
Date of assessment: 22/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Rowi Reserve
Field number: 1
Date of assessment: 8/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	Water table found within the upper 0.5 m
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	No decompaction treatment is ever carried out
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Tamarahi Reserve
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 3

Overall Quality Description Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

Existing soil conditions and infrastructure suggest that upgrade to accommodate increased usage is feasible

Interpretation of results in terms of drainage upgrade

A drainage upgrade would capitalise on the inherent field qualities and increase usage

Interpretation of results in terms of soil-based field quality

The field is in good overall condition although poor winter conditions limit use and prevent additional use



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Soil and Construction Quality Report



Name of park: Waikite Park
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Waikite Park
Field number: 2
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 5

Overall Quality Description Low Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	Clay dominant and highly compacted or peat based
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	Extensive laser levelling is needed due to surface shape
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

Field can perform well under good ground conditions but is highly susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A major drainage and infrastructure upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

Improved maintenance/physical treatment/irrigation may improve field quality



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Soil and Construction Quality Report



Name of park: Westbrook Reserve
Field number: 1
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	-
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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Soil and Construction Quality Report



Name of park: Westbrook Reserve
Field number: 2
Date of assessment: 9/08/2018
Name of assessor: Blair Cornthwaite
Affiliation of assessor: SSDM

Overall Quality Rating Grade 4

Overall Quality Description Below Average Quality

Characteristics that require further attention

Inherent Profile Properties	Description
Topsoil texture	-
Topsoil structure	-
Soil smell and colour	-
Subsoil condition	-
Presence of water table	-
Upgrading / Renewing Potential	
Current state of construction	-
Average depth of topsoil	-
Settlement	-
Ease of trenching	-
Upgraded Status / Profile Management	
Profile decompaction	-
Profile aeration	No aeration treatment is ever carried out
Type of drainage system	No lateral drainage system is installed
Type of irrigation system	No irrigation system is installed
Surface Levels and Surrounds	
Uniformity of slope	-
Extent of slope	The surface has no uniform slope
Surrounds	-
Presence of hard surfaces	-

Interpretation of overall quality rating

The sports field achieved standard construction qualities but is susceptible to damage from unmanaged use

Interpretation of results in terms of drainage upgrade

A drainage upgrade would be required if future usage demand exists

Interpretation of results in terms of soil-based field quality

The soil field may respond to enhanced management but will not tolerate intensive winter use



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