8511 Rubber Soft Fall

REVISION 13/03/2024

8511.1 Introduction

This supplementary requirement applies to the supply and installation of soft fall rubber and artificial turf surfacing to footpaths, playgrounds, etc., as detailed in the project drawings.

8511.1.1 Definition of terms

The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications* and AS/NZS 4422 *Playground Surfacing – Specifications, Requirements, and Test Methods"*.

Additional terms used in this Technical Specification are defined in the Table below.

Term	**Definition as Applies to this Specification**
Certified Soft-Fall Sand	Clean washed sand, externally tested and certified against AS4422 for falls in playground applications.
Rubber Soft Fall	Proprietary product - Softfall rubber mix surfacing
Shockpad	Polymerically bound recycled rubber underlay of varying thickness dependent on the critical fall height requirement, installed under the rubber soft fall surfacing.
Critical Fall Height	The maximum free height of fall for which a surface provides an acceptable level of impact attenuation.
Impact Attenuation Zone	Zone under and around equipment minimising serious head and other injuries in the event of a fall

8511.2 Referenced Documents

This supplementary specification shall be read in conjunction with the following:

- MRS01 *"Introduction to Specifications"*;
- MRTS01 *"Introduction to Technical Specifications"*;
- MRS and MRTS04 "*General Earthworks*"
- MRS05 and MRTS05 "*Unbound Pavements*"
- MRS07B and MRTS07B "*Insitu Stabilised Pavements using Cement of Cementitious Blends*";
- MRS70 and MRTS70 *"Concrete"*
- MRC Supplementary Specification 8408 "*Crusher Dust*";
- MRC Supplementary Specification 8300 *"Landscaping & Horticultural Treatment"*
- MRC Supplementary Specifications 8320 *"Landscape Footings"*
- MRC Supplementary Specifications 8349 *"Playground Drainage"*
- MRC Supplementary Specifications 8107 *"Subsoil Drainage, Type C"*
- AS/NZS 4422: Playground surfacing – Specifications, requirements and test method
- AS 1302: Steel reinforcing bars for concrete
- MRC Standard Drawing A4-00584 "*Typical Playground Edging to Softfall Rubber*";
- Preferred supplier's specifications; and
- the project Drawings.

8511.3 Description of Work

Work items incorporated by this supplementary specification are identified in Section 8511.6 and 8511.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8511_1 Rubber Soft Fall Section 1

8511.4 Quality Systems Requirements

8511.4.1 Std Test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Unless otherwise stated the manufacturer certification of the soft fall product forms the basis of the requirements.

Post construction conformity testing as per AS/NZ 2244 shall be carried out and certification of the works issued to Council.

Civil works activities associated with the floor of excavation and concrete pours shall be tested as per the relevant MRTS specification MRTS04, and MRTS70 unless otherwise approved by the Superintendent.

8511.4.2 Hold Points, Witness Points and Milestones

The following table represents the minimum inspection requirements for this specification;

Activity	Inspection Type	When
Material/Product certification	Milestone	4 Weeks prior to works commencing
Construction procedure and other required submissions as per Clause 8511.5	Milestone	4 Weeks prior to works commencing
Adhesive type and MSDS submission	Witness Point	Prior to completion of the crusher dust bedding layer
Inspection of delivered items	Hold Point	At delivery time for each item.
Final location of soft fall area	Hold Point	During site survey layout.
Excavation of material and drainage of site	Witness Point	At completion of excavation
Bed/Subgrade excavation floor proof roll	Hold Point	At completion of excavation and compacting
Sub soil drainage installation	Witness Point	Completion of subgrade proof roll
Sub-base course proof roll	Hold Point	After compaction
Concrete edging prepour including bed	Hold Point	Prior to pouring concrete
Approval to strip formwork	Hold Point	After 70% strength gain
Approval to backfill to kerb	Hold Point	7 days after stripping and prior to installation of base course against kerb
Approval for topsoiling and turfing	Witness Point	After backfilling has been completed
Installation 4% cement treated crusher dust layer finished surface to level and compaction requirements	Hold Point	After sub-base course proof roll approval to proceed
Installation of shockpad layer	Witness Point	After stabilised crusher dust layer has been inspected and approval to proceed
Laying and glueing of soft fall	Witness point	During laying activities to ensure all

layer/s		tile and/or artificial turf surface is completely covered with adhesive
Surface finish of soft fall including joins	Hold Point	Prior to conformity testing to view compliance with design drawings
Removal of excess adhesive	Witness Point	During and at completion of laying of soft fall tiles and/or artificial turf
Laying defects of join gaps which affect cosmetic appearance or safety	Hold Point	Completion of works prior to conformity testing
Conformity testing	Hold Point	After completion of works and glue has cured
Works as Executed documentation	Hold Point	Minimum 14 days prior to practical completion being requested.

8511.4.3 Construction Tolerances

Unless noted on the design drawings or otherwise approved by the Superintendent the following construction tolerances shall apply to this Specification;

The construction activity outcome shall not depart from the widths, lengths, heights, and shapes specified by design drawings as applies to this specification;

- MRC Standard Drawing A4-584 *"Typical Playground Edging to Softfall Rubber"*
- Drainage tolerances in accordance with MRTS03 Drainage Structures, Retaining Structures and Embankment Slope Protections
- Earthworks tolerances in accordance with MRTS04 Earthworks General
- Pavement tolerances in accordance with MRTS05 Unbound Pavement
- Manufacturers dimensions and tolerances for installation of recycled plastic bollards

Tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8511_1 Rubber Soft Fall

8511.5 Preliminary

The proposed product and installation procedure are to be confirmed with the Superintendent. Samples and certificates of compliance to the material requirements must be submitted for approval a minimum 4 weeks prior to ordering of materials. Council takes no responsibility for ordered materials which have not been approved for use. **(MILESTONE)**

Suppliers shall provide a copy of the certified test results, confirming at different critical fall heights what impact absorbing surface material depth or structure is necessary to comply with the impact absorbing requirements of Australian Standard 4422 Playground Surfacing - Specifications, requirements and test methods.

The Contractor is to submit or ensure the following documentation is in place 4 weeks prior to delivery or a prestart is conducted **(MILESTONE)**:

- Material/Product Certification and report for critical different fall heights
- Construction and installation procedure
- Quality Plan
- Workplace Health and Safety Plan

Other requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8511_1 Rubber Soft Fall **(MILESTONE)**

8511.5.1 Materials

All materials supplied under this specification must comply with the requirements of the current version of AS/NZS 4422-: Playground surfacing – Specifications, requirements and test method

All top layer treatments shall be constructed from 995mm (width) x 995mm (length) x 16mm (depth) tiles, artificial turf or EPDM rubber softfall (poured rubber) installed to the thickness as per the design drawings, and be manufactured from polymerically bound recycled rubber and ethylene propylene diene monomer (M-class) rubber with a minimum density of 700kg/m³.

All impact attenuation zone thickness increases shall be constructed from 1m (width) x 1m (length) tiles. Tiles are to be manufactured from polymerically bound recycled rubber and polystyrene with a minimum density of 450kg/m³, with a depth generated from the critical fall height analysis specific to the location and equipment being considered.

Adhesives used are to comply with the shockpad and rubber soft fall manufacturers requirements, the type along with the Material Safety Data Sheet (MSDS) are to be submitted to the Superintendent for review and approval prior to the completion of the crusher dust bedding layer. **(WITNESS POINT)**

The design of the soft fall rubber surfacing must consider, but not be limited to:

- sub-base
- materials
- slip resistance
- fire resistance
- impact absorbency
- critical fall height analysis
- fall zones
- colour
- permanency of colour
- wearability and maintenance in use
- UV exposure and atmospheric temperature

8511.6 Construction

This section lays out the works operations with more detail based on specific requirements of this supplementary specification. Some activities may appear to include items which are stated within other specifications, the purpose is to reinforce that requirement specific to this supplementary specification.

Specific construction requirements associated with these works is detailed in MRC Supplementary Specification Annexure 8511_1 Rubber Soft Fall Section 5

The construction procedure for the installation of the soft fall surfacing shall be in accordance with the manufacturer's specifications, and the construction procedures shall be submitted to the Superintendent for approval, 4 weeks prior to works commencing or the prestart meeting.

However, specific note is given for consideration of the following items, as part of the installation:

- The need for sub-surface drainage installations shall be considered based on the permeability of the subgrade material on site and the grade of the surrounding land;
- All base construction is to be undertaken using non-cohesive granular materials to the depth specified by the manufacturer, and compacted in accordance with the requirements of MRTS04;
- All cement stabilisation is to be undertaken in accordance with the requirements of MRTS07B;
- All soft fall tiles and artificial turf surfacing shall be installed using an adhesive applied to 100% of the shockpad surface, edging surfaces, and between any joins in the surfacing to the manufacturer's specifications; and

8511.6.1 Work Operations

Work Operations incorporated in these items include:

a) **Work operations included in Clause 2.1.5 of MRS01 "Introduction to Standard Specifications";**

b) Supplying all materials, plant, and equipment;

All materials, plant, equipment, and labour required to carry out the works under this Specification is to be supplied by the Contractor, where materials are Principal supplied the designated storage site will be the point of supply for the purposes of this Specification.

All items shall be inspected at delivery to site prior to use. Any items which are damaged are not to be used and are to be returned to the supplier. **(HOLD POINT)**

c) Site layout with superintendent

The final location and extent of the soft fall area is to be marked out on site and shall be inspected and approved by the Superintendent prior to excavation commencing. This is to ensure the dimensions are correct to the plans and site layout complies with the purpose of the artificial turf. **(HOLD POINT)**

d) Carrying out excavations;

Excavation of material shall be carried out in accordance with MRTS04 to level and grade as per design plans, vertical tolerances shall not exceed +5mm/-10mm. If not specified on design drawings excavation depth to be as per MRC Std drawing A4—00584

Area surrounding the soft fall feature is to be shaped to ensure water runoff is directed around the soft fall area as per the design plans, in the absence of detail the superintendent shall direct the Contractor to carry out earthworks (similar to the installation of swales).

Bed/Subgrade is to be inspected for areas of unsuitable material **(HOLD POINT)**

If unsuitable material is identified this is to be removed and replaced with approved material as per the instructions of the Superintendent

e) Utilising or disposing of excavated material;

Excess excavated materials shall be disposed of or utilised as per Superintendents instructions. Material stockpiled shall ensure that all Environmental ESC measures are in place and maintained

f) Installation of Subsoil Drainage (as required)

Where design drawings show subsoil drainage requirement this shall be supplied and installed as per design drawings, in the absence of detail MRC Std drawing A4 — 00584 and MRC Supplementary Specification 8107 shall apply. This includes connection to a point of discharge outside of the rubber soft fall area, refer to MRC Supplementary Specification 8349 - Playground Drainage. **(WITNESS POINT)**

g) Preparation of subgrade prior to placement of base layers

The bottom of the excavation shall be treated as subgrade as per MRTS04 and compacted to 97% SDD and tested at a frequency of 1/200m2

All loose material is to be removed from floor of excavation.

Bottom of excavation is to be presented for inspection and proof rolled in the presence of the Superintendent prior to sub soil drainage being laid **(HOLD POINT)**

h) Installation of Concrete Edging (as required)

Bed for concrete kerb is to be installed as per MRC Std Drawing A4-00584 and compacted to 100% SDD and tested at a frequency of 4 tests per 500m2 as applies to the sub-base course material.

Formwork is to be supplied and installed in accordance with AS3600 and AS3610 and the design drawings. Installed formwork has been installed to project drawings line, levels and shape, positional tolerance Horizontal +25mm/-5mm, Vertical +/-5mm's.

Reinforcing complies with project drawings and AS1302, in the absence of detail MRC Std Drawing A4-00584 shall apply.

Inspection of reinforcing and formwork prior to pouring **(HOLDPOINT)**

All concrete is to be batched, transported, placed, and compacted in accordance with MRTS70 including all required testing unless otherwise specified in MRC Supplementary Specification 8511_1 Rubber Soft Fall Annexure

Finishing of the concrete is to be in accordance with the design drawings.

Construction and Contraction/Expansion Joints are to be incorporated as per the design drawings or as per the Superintendents instructions.

Immediately after the initial set of the concrete curing shall commence and continue for a minimum of seven days. Plastic sheeting shall not be used as part of the curing process.

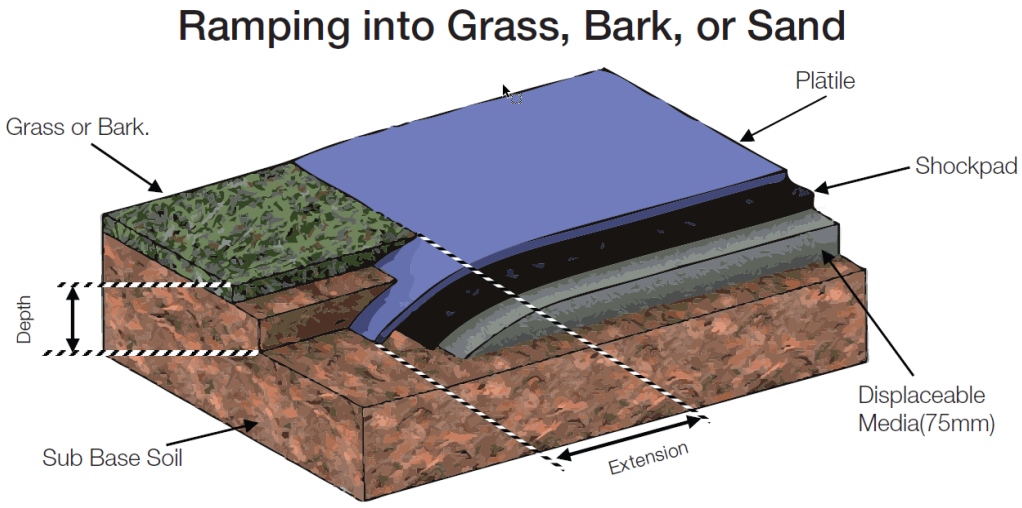
Formwork is not to be stripped prior to 70% strength being gained or as approved by the Superintendent **(HOLD POINT)**.

Unless approved by Superintendent further works (including backfilling and the laying of the sub-base course) against the kerb must not occur until after 7 Days of stripping, curing is to continue for this period.

i) Backfilling and turfing to soft fall area

Backfilling to kerb is not to occur until after curing has occurred and is to be carried out in accordance with MRC Standard drawing A4-5854.

Where no edging is installed the finishing and backfilling shall be as per the design drawings and utilize a roll over edge around the area similar to the below depicted drawing



	Extension	Depth
Grass	150mm	100mm
Bark	300mm	300mm
Sand	300mm	300mm

Topsoil materials used and installation shall comply with MRC Supplementary Specification 8300 and be left to settle prior to turfing being laid.

The topsoil is to be graded and any settled areas be further top soiled prior to turfing occurring, turf type and laying is to be in accordance with the design plans. **(WITNESS POINT)**

Where backfilling and turfing is required it shall be left 10mm below level of concrete finished level.

j) Supply, placement and compaction of sub base layer/s, in accordance with MRC standard drawings, MRS05 and MRTS05 and the project Drawings

The kerb must be backfilled and compacted prior to the sub-base course installation. Upon the Superintendents approval to proceed with the sub-base course the contractor shall supply, place, and compact the road base course to 100% SDD and tested at a frequency of 4 tests per 500m2 in accordance with MRC Std drawing A4—00584 and MRTS05.

The contractor shall make arrangements for the Superintendent to inspect the finished sub-base course and carry out a proof roll. The contractor shall be responsible for any damage caused to the concrete edging. **(HOLD POINT)**

k) **Preparation of surface and bedding according to the manufacturer's requirements;**

A 4% cement stabilised crusher dust layer shall be supplied, placed, and compacted to 100% SDD and tested at a frequency of 4 tests per 500m2 in accordance with design drawings, where there is an absence of detail MRC Std Drawing A3-09729 shall apply with all construction works are to be performed in accordance with MRTS05 including testing.

Prior to installation of shock pads the finished crusher dust shall have less than 6mm variation from a 3m straight edge in all directions, where this does not comply the layer shall be regraded to comply with the required geometrics **(HOLD POINT)**

l) Installation of soft fall surfacing, in accordance with details provided on the project drawings, and to the manufacturer's specification and Superintendent's approval;

The Superintendent shall give approval to commence laying the shockpad when all quality requirements of the sub base and crusher dust layer comply.

The contractor shall plan the shockpad laying pattern to ensure the finish soft fall surfacing can be laid in the pattern as required by the design drawings.

Where soft fall tile is installed, the shockpad shall be laid in a runner bond (brick) pattern to reduce tile joint length and be laid at a different angle to the soft fall surfacing so the joins do not align. **(WITNESS POINT)**

The first row of the shockpad layer laid shall be continuous and;

a. Ensure that the cut edges around the entire perimeter of the installation will be approximately equal in size.

b. The tiles should be placed in the area that requires the least cutting around posts and other structures.

The shockpad joins shall be installed as required by the manufacturers specification shown on the design drawings.

Laying of soft fall surfacing shall be completed in one day where practical to ensure no colour variation from UV rays and at a different angle to the shockpad laying pattern and as soon as practical after the shockpad tiles have been laid.

Where tiles are used the first row of the soft fall tiles laid shall be continuous and to;

a. Ensure that the cut edges around the entire perimeter of the installation will be approximately equal in size.

b. The first-full-continuous-row of tiles should be laid parallel to the longest continuous perimeter length or where the highest walk on traffic is expected.

c. This first-continuous-row of tiles should also be the row immediately adjacent to the edge tiles. If the site is laid out so that no tiles actually need to be cut at the edge, then the first-continuous-row should actually be the edge row.

d. The first-continuous-row of tiles should be placed in the area that requires the least cutting around posts and other structures.

The spreading and rate of application of adhesive shall be 100% cover to all surfaces, and be carried out within the working life of the adhesive (before setting) as required by the manufacturers requirements. **(WITNESS POINT)**

Once each area is laid into the wet adhesive it must then be rolled with a 50kg+ flooring roller to get the adhesive transfer to the back of the soft fall rubber surfacing. **(WITNESS POINT)**

m) Complete final installation

All adhesive spills must be removed from the surfacing, depending on the type of spill the Superintendent must be informed of the spillage and the method of removal. If the spill is significant and has seeped into the face of the soft fall surface the affected area shall be replaced at no cost to the principal. **(WITNESS POINT)**

If during the laying process gaps in the joints or against the edging impairs the cosmetic appearance or safety of the system they shall be filled with black polyurethane adhesive and neatly finished off, the Superintendent is to approve all joint gap filling and finishing. **(HOLD POINT)**

n) Testing for conformity with construction procedures and specifications;

The surface must be tested and certified as complying with AS/NZS 4422, Playground Surfacing - Specifications, requirements and test methods through performing impact test assessment, this is to be carried out in the presence of the Superintendent. **(HOLD POINT)**

o) Clean up of Site;

Site is to be cleaned of all debris, excavated material, construction materials, and where turf has been laid establishment has occurred with water runoff from the surrounding area visibly directed around the soft fall area.

8511.7 Post Construction

a) Collection and submission of all As Constructed data including QA data requirements.

The Contractor is to supply and submit Works as Executed documentation as required by MRC *D20 - Drawings and Documentation* for approval by the Superintendent 14 days prior to requesting a practical completion inspection. **(HOLD POINT)**

Format of submitted "As Constructed" documentation shall be compliant with MRC Supplementary Specification 8919.

8511.8 Measurement and Payment

Provision for these works shall be included in the scheduled unit rate for the items show in Clause 8511.3 of this Supplementary Specification and annexure. Work operations listed above for soft fall surfacing shall be claimed per square metre installed, under the items stated in Clause 8511.3.

No separate payment will be made for the works specified within this Supplementary specification or it's annexure. Any works associated with replacement of non-conforming material and/or construction procedures shall be at no cost to the Principal.

Version Control:

Version	Description	Reviewed / Endorsed	Date
1.0	Original issue		05.08.2014
1.1	Review	R. Mogg	11.04.2022
2.0	Review of specification	C. Sultana	13.03.2024