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Document Title	Subgrade Replacement Procedure
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Approved By	Brendan McKenna
Position	Director
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Purpose

Brendan McKenna Earthmoving is committed to replacing unsuitable subgrade safely, efficiently and in accordance with engineering, environmental and quality requirements.

This procedure establishes the requirements for identifying, excavating, replacing and compacting unsuitable subgrade material to achieve a stable pavement foundation while protecting workers, underground services, surrounding infrastructure and the environment.

This procedure support

s compliance with the Work Health and Safety Act 2011 (Qld), Work Health and Safety Regulation 2011 (Qld), Environmental Protection Act 1994 (Qld) and Brendan McKenna Earthmoving's Integrated Management System (IMS).

Scope

This procedure applies to all Brendan McKenna Earthmoving employees and contractors undertaking subgrade replacement activities at company worksites.

It applies to activities including:

- Survey and set-out.
- Identification of unsuitable subgrade.
- Excavation and removal of unsuitable material.
- Placement of replacement material.
- Compaction.
- Final trimming.
- Verification of finished levels.
- Associated earthmoving plant operations.

Responsibilities

Role	Responsibilities
Director	Ensure adequate resources, plant and systems are available to safely undertake subgrade replacement activities.
Operations Manager	Plan subgrade replacement activities, verify pavement design requirements and ensure this procedure is implemented.
Supervisors / Site Managers	Coordinate subgrade replacement, verify compliance with this procedure, monitor safety, quality and environmental controls and ensure work is completed in accordance with project specifications.
Health & Safety Representative (HSR)	Participate in worker consultation, assist with hazard identification and support continual improvement of subgrade replacement activities where required.
Employees / Plant Operators	Operate plant safely, comply with this procedure, report hazards and equipment defects and maintain environmental controls.
Survey Personnel (where required)	Establish survey control, verify levels and provide survey information to support accurate subgrade replacement activities.

Procedure

Brendan McKenna Earthmoving shall ensure all subgrade replacement activities are undertaken using suitable plant, competent personnel and approved engineering controls to achieve a safe, stable and compliant pavement foundation.

Subgrade replacement shall be completed in accordance with approved pavement design, survey control and engineering specifications to achieve the required pavement performance.

1. Planning and Site Preparation

Prior to commencing subgrade replacement, personnel shall ensure all planning activities have been completed and the work area has been assessed.

This shall include:

- Completing all required site inductions.
- Participating in the daily pre-start meeting.
- Completing a Personal Risk Assessment (Take 5) where required.
- Reviewing the relevant Safe Work Method Statement (SWMS) where applicable.
- Completing a **Dial Before You Dig (1100) / Before You Dig Australia (BYDA)** enquiry and identifying underground and overhead services in accordance with service plans and site investigations.
- Clearly demarcating and delineating the approved work area.
- Reviewing approved pavement design drawings and confirming the required box depth and finished subgrade levels.
- Confirming the Total Station, grader control system and survey information are available and calibrated.
- Confirming all required plant, rollers, water truck and supporting equipment have been organised prior to commencing work.
- Confirming survey control points, benchmarks and access routes.
- Reporting any discrepancies between approved pavement design, survey information or site conditions to the Site Manager before subgrade replacement commences.

No person shall enter the work area unless authorised by the Site Manager.

Only trained, competent and authorised personnel shall undertake subgrade replacement activities.

2. Subgrade Replacement

Subgrade replacement shall be completed in accordance with approved pavement design drawings and project specifications.

The following construction sequence shall be followed:

- Set up the **Total Station** in accordance with the manufacturer's instructions and project survey requirements.
- Connect the grader to the Total Station and bench the grader to within **1 mm**.
- Confirm the correct pavement box depth from the approved pavement design.
- Identify and clearly mark all soft spots using line marking paint.
- Excavate and remove unsuitable material to a **minimum depth of 200 mm**, or deeper where required, until competent founding material is reached.
- Place suitable replacement material in accordance with the approved pavement design and project specifications.
- Compact the replacement material using the flat drum roller until the required density is achieved.
- Trim excess material using the grader.
- Complete the final trim using the bobcat to achieve the exact box height.
- Complete final compaction using the flat drum roller before finishing with static rolling.

Replacement material shall be suitable for the approved pavement design and compacted in accordance with project specifications before further pavement construction proceeds.

Personnel shall continually monitor:

- Survey accuracy.
- Moisture content.
- Ground conditions.
- Weather conditions during conditioning and compaction.
- Plant interaction.

- Compaction quality.
- Soft spots.
- Underground services.
- Environmental controls.
- Excavation stability.

Any unsafe condition or non-conformance shall be reported immediately to the Site Manager.

3. Plant and Equipment Operations

Subgrade replacement shall be completed using suitable plant and equipment appropriate for the work activity.

Plant selection shall be appropriate for the ground conditions, excavation depth and replacement material being installed.

Plant and equipment that may be utilised includes:

- Grader
- Excavator
- Bobcat
- Flat Drum Roller
- Multi-Tyred Roller
- Water Truck

All operators shall hold the appropriate licences, competencies or verified training applicable to the plant or equipment being operated.

The Operations Manager or delegated Supervisor shall ensure operator competencies have been verified prior to commencing work.

Validation of Competency records shall be retained with the operator's training records in accordance with company requirements.

Operators and ground personnel shall maintain continual awareness of surrounding personnel, mobile plant, changing ground conditions and exclusion zones throughout subgrade replacement activities.

4. Quality, Compaction and Environmental Controls

Subgrade replacement shall be completed in a manner that achieves the required pavement strength, compaction and finished surface while protecting the surrounding environment.

This shall include:

- Verifying the completed subgrade replacement achieves the required levels, pavement box depth and finished surface in accordance with the approved pavement design.
- Confirming the replacement material has reached optimum moisture content before final compaction.
- Compacting the replacement material until the required density has been achieved in accordance with project specifications.
- Inspecting the completed subgrade replacement for soft spots, rutting, segregation, ponding or other defects.
- Re-excavating, replacing, reconditioning and recompacting any areas that do not achieve the required standard.
- Confirming replacement material complies with the approved pavement design, project specifications and required material quality before further pavement construction proceeds.
- Maintaining erosion and sediment controls throughout the duration of the works.
- Preventing unnecessary disturbance outside the approved work area.
- Reporting environmental incidents, spills or failures of environmental controls immediately to the Site Manager.
- Leaving the work area in a clean, safe and compliant condition.

5. Documentation and Completion

Subgrade replacement activities shall be documented in accordance with company requirements to demonstrate compliance with engineering specifications, quality requirements and the Integrated Management System.

This shall include:

- Completing Pre-start Inspections for all plant and equipment used.

- Completing a Personal Risk Assessment (Take 5) through the MCK Group App where available.
- Completing paper versions of the Pre-start Inspection and Personal Risk Assessment where mobile coverage is unavailable and forwarding completed records once adequate signal is available.
- Completing a Job Hazard Analysis (JHA) where activities fall outside the scope of this procedure or additional risks have been identified.
- Recording survey verification, level checks, compaction testing and quality control results in accordance with project requirements.
- Reporting hazards, incidents, near misses and equipment defects in accordance with company procedures.
- Confirming the completed subgrade replacement complies with the approved pavement design, project specifications and quality requirements before leaving the work area.

Records

The following records may be retained where relevant to subgrade replacement activities.

Record	Responsibility	Retention Location
Personal Risk Assessments (Take 5)	Employees and Contractors	MCK Group App / Site Records
Plant Pre-start Inspection Records	Plant Operators	Plant Records
Validation of Competency Records	Operations Manager	Training Records
Survey Verification Records	Survey Personnel / Site Manager	Project Records
Compaction Test Results	Site Manager / Supervisor	Project Quality Records
Construction Inspection Records	Supervisors	Inspection & Audit Register
Incident and Hazard Reports	Employees and Supervisors	Incident Records
Corrective Actions	Operations Manager	Incident / NCR / Corrective Action Register

Related Information

- HS-PR-001 Risk Assessment Procedure
- HS-PR-003 Personal Risk Assessment (Take 5) Procedure
- HS-PR-005 Incident Investigation & Reporting Procedure
- OP-PR-018 Spill Response & Management Procedure
- HS-SWMS-006 Operating Mobile Plant
- HS-SWMS-005 Working in or around Trenches & Excavation
- Environmental Management Plan (where applicable)
- Environmental Aspects & Impacts Register
- Inspection & Audit Register
- Training & Competency Register
- Incident / NCR / Corrective Action Register
- MCK Group App
- Before You Dig Australia (BYDA)
- Work Health and Safety Act 2011 (Qld)
- Work Health and Safety Regulation 2011 (Qld)
- Environmental Protection Act 1994 (Qld)

Review and Revision

This procedure shall be reviewed every two years or earlier following legislative changes, organisational changes, incidents, audit findings, changes to work practices or identified improvement opportunities.