EMPs and Design Development

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John Holland

Established in Victoria in 1949. Since then the John Holland Group has expanded operations across Australia and is now one of the largest contractors in the nation. We cover civil, building, water, tunnelling, rail, power, telecommunications, services and are returning to mining projects.

Currently around $4B work Australia-wide

Northern Region (Qld, NT, Asia) environmental team

Headed by Brett Watkins – Environment & Approvals Manager
Currently 10 project-based environmental representatives

Our environmental focus

Top-down environmental commitment
Sustainability and continuous improvement – system, people, processes
Risk based environmental management – tender to demobilisation
EMS – ISO14000 certified
All projects have EMP/s appropriate to the style

> John Holland

Current Queensland projects include:

Green Bridge

South Bank Education and Training Precinct

Mackay Water Recycling Project

BWEA Alliance - WTP (Oxley, Sandgate, Wacol and Wynnum)

Powerlink transmission lines

Gold Coast Desalination Plant

PHOTO

Canungra Base Redevelopment

Ross River Dam Upgrade
Merrimac Waste Water Alliance

> Overview

- Why do we need an EMP for the design?
- Who should use it?
- When should it be developed?
- What does the Design EMP cover?
- Key aspects and use
- Design criteria
- Environmental design report
- Where can things go wrong?
- Getting the best outcome
- Case study – Green Bridge

> Need for Design EMP

Provides the client with a documented process for incorporating environmental protection and minimising impacts by the design

Documents project approval and legislative environmental requirements

Details responsibility and accountability for incorporation of environmental measures

Tool for designers and environmental staff to be aware of general and specific environmental aspects

Provides a plan that is auditable and as a basis for design verification

Documents how the design will reduce and/or manage C&M impacts

Basis for the Environmental Design Report

> Who uses the Design EMP?

Client – as a means of proving duty of care and compliance with brief. Also for auditing and verification

Designers – as a tool for incorporation of criteria into design

Environmental staff – as designers, verifiers, permit application writers, providers of specialist advice

Contractors – as a point of history for design development, or as a management tool for a D&C project

Stakeholders or approval authorities – as evidence of effective management of environmental aspects within the design

> When to develop

Ideally prior to design development

Early enough to be used as an awareness and training tool

During bid process for D&C projects

Note: Some Design EMPs can take significant effort to develop – mainly due to the need to review a number of past reports and documents

> What does the Design EMP cover?

- Project description
- Project management system
- Client's requirements – scope, brief, deliverables, outcomes
- Previous studies and investigations
- Statutory requirements – Acts, policies, standards, guidelines, approval conditions
- Environmental management strategies
  - objectives, impacts, performance criteria, statutory requirements, **design criteria**, responsibilities
- auditing, compliance, **verification** and reporting

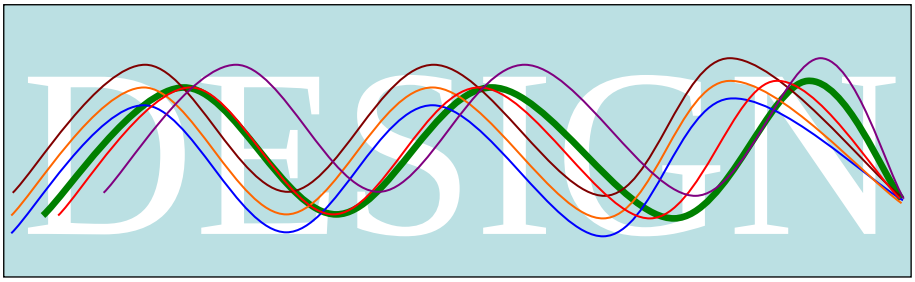
Also:

- Permit and approval requirements
- Training and awareness, areas for innovation, additional studies.
- Environmental stakeholders or approval agencies for consultation

> Key aspects and use

Design EMP is just a document – implementation is the key

Interactive approach to design by all design team members will ensure the best overall outcome for the design



Clear and concise design criteria is a must

Ongoing verification ensures ‘no surprises’

> Design criteria

Most important component

Prepared from numerous documents, e.g.:

- IAS/EIS - EMP Planning
- Project approvals and permit conditions
- Client brief
- Subsequent environmental studies (e.g. contaminated land, detailed veg surveys, baseline monitoring, modelling).
- Legislation, guidelines and standards
- Stakeholder and community requirements

General: “minimise vegetation clearance around creeks”

Specific: “noise barriers at Smith Street to incorporate see-through panel”

Unachievable? due to other design constraints

Expensive – e.g. Compton Road – but can be cost neutral

> Environmental Design Report

Can ‘cut and paste’ from Design EMP, but additional criteria can be added

Develops parallel to design

Clearly documents how design criteria is met

Regular checks against design development – eg 30%, 50%, 80% stages

Finalise EDR at design completion and should form part of design documentation for handover to client or contractor

> Where can things go wrong?

Design EMP - cut and paste from EMP Planning and shelved

Bringing on environmental staff late or at end

Environmental staff not part of design team

Env staff not understanding design process or not working as a team

EMP Planning – trust completely – may be dated, may use old legislation, may be a better way. Locations or criteria are not clearly identified.

> Where can things go wrong?

Not incorporating project approval conditions

Client additions not considered in EIS

Finer details not being considered – e.g. service roads, fencing, sediment ponds in riparian areas, PUP relocations, construction access requirements, interim drainage

Losing sight of the big picture

> Getting the best outcome

Simple document - design criteria tabulated with clear responsibilities

Design criteria should be easily understood – design speak not enviro-speak – e.g. ephemeral, RE, endemic, avifauna

All design criteria to be allotted to a design lot or design team leader/s

Design criteria stand alone – no need to re-read EIS, find location

Ground truth where required

Use GIS or AutoCAD layers for area constraints – visual tools or photos help

> Getting the best outcome

Design EMP is mainly for designers' use

Environmental staff to provide context, background to issues

Use EDR to drive verification, identify conflicts, opportunities / innovation

Environmental staff to be part of design team and take opportunity to teach AND learn. To be included in VM and risk workshops.

Consider construction aspects in all design decisions to avoid wasted effort

Effective implementation ensure best outcome for project, clients, stakeholders, regulators and the environment

> Getting the best outcome – Oxbow

Working with all stakeholders at the Bulimba Creek oxbow ensured a degraded 30ha site is now an important ecological refuge

> Case study – Green Bridge

Brisbane City Council awarded John Holland a contract to design, construct and maintain the $55.5M cable-stay bridge and associated works.

The bridge is 500 m long with a 180m span across the Brisbane River, supported by two 70m high twin-columns

Expected to open to buses, pedestrians and cyclists by early 2007.

> Case study – Green Bridge

Environmental design aspects incorporated into Design EMP, EDR

Committed D&C team ensures the best outcomes

Paula Weatherhog is current PER

> Case study – Green Bridge

Bioretention basins – UQ & Dutton Park & triple interceptors

> Case study – Green Bridge

Design alignment chosen to avoid mature Banyan Fig
Corridor of river gums retained, with minor lopping only required to largest
Minimal impacts to mangroves

> Case study – Green Bridge

Habitat transfer/replacement – possum boxes, bird nest boxes and two native bee hives relocated

Little corella in hollow of mature river gum

> Case study – Green Bridge

Architectural roof structure which incorporates a solar array. The energy neutral “green bridge” - gas-powered buses, pedestrians and cyclists only.
Triple plantings – i.e. 60 trees lost, 180 replaced + shrubs, g/covers