

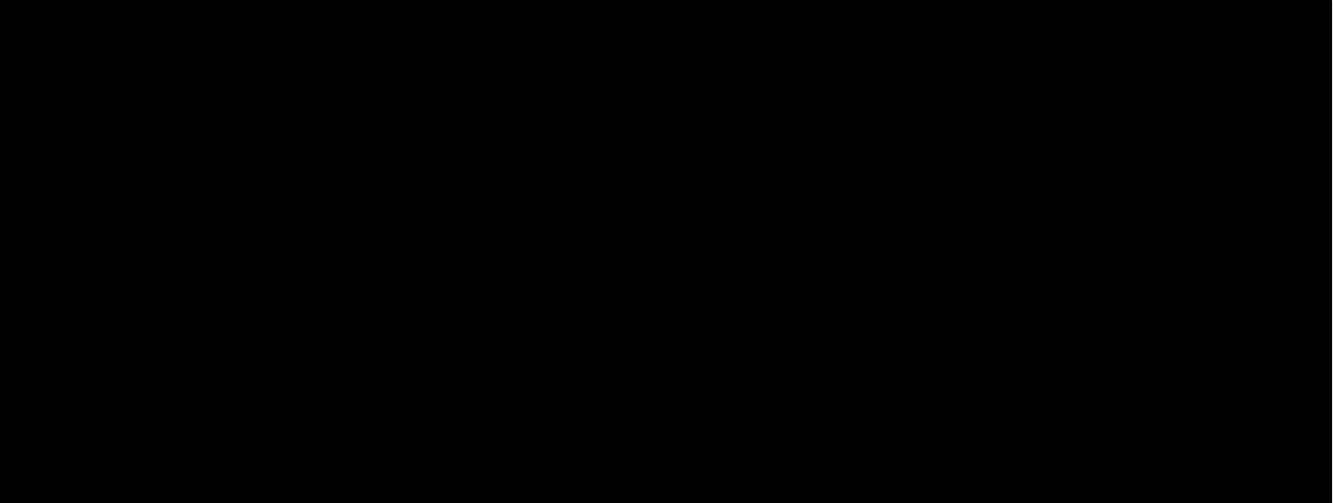


CBGU D&C JV

Climate Change and Sustainability Management Plan

Cross River Rail Project – Tunnel, Stations and Development
Package (TSD)

REV	DATE	PREPARED BY NAME & SIGNATURE	REVIEWED BY NAME & SIGNATURE	APPROVED BY NAME & SIGNATURE	REMARKS
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Revision: 1

Compliance Matrix

Table 1 Compliance matrix

CRRDA REFERENCE	REQUIREMENT	ADDRESSED IN SECTION																					
Coordinator-General’s change report – whole of project refinements 2019																							
Condition 13 Air Quality	A) Project Works must aim to achieve the goals in Table 2 below.	<i>Air Quality Management Plan – REF (AQMP)</i>																					
	<table border="1"> <thead> <tr> <th>Criterion</th> <th>Air Quality Indicator</th> <th>Goals</th> <th>Averaging Period</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Human Health</td> <td>Total Suspended Particulates (TSP)</td> <td>90 µg/m³</td> <td>1 year</td> </tr> <tr> <td>Particulate Matter (PM)</td> <td>50 µg/m³</td> <td>24 hours</td> </tr> <tr> <td></td> <td>25 µg/m³</td> <td>1 year</td> </tr> <tr> <td rowspan="2">Nuisance</td> <td>TSP</td> <td>80 µg/m³</td> <td>24 hours</td> </tr> <tr> <td>Deposited dust</td> <td>120 mg/m³/day</td> <td>30 days</td> </tr> </tbody> </table>		Criterion	Air Quality Indicator	Goals	Averaging Period	Human Health	Total Suspended Particulates (TSP)	90 µg/m ³	1 year	Particulate Matter (PM)	50 µg/m ³	24 hours		25 µg/m ³	1 year	Nuisance	TSP	80 µg/m ³	24 hours	Deposited dust	120 mg/m ³ /day	30 days
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B) During construction, monitor and report on air quality in accordance with the AQMP, a sub-plan of the CEMP	<i>AQMP</i>																						
Schedule 1 – Environmental Design Requirements 11	A) The Project is designed to minimise waste generation and maximise the reuse and recycling of waste materials generated by the Project during its construction and operation.	<i>Waste Resource and Recovery Management Plan – REF (WRRMP)</i>																					
	B) Opportunities are investigated during the detailed design phase for the use of recycled materials, including for Project infrastructure produced from concrete, road base, asphalt and other construction materials.	<i>WRMP</i>																					
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Condition 16 Water Resources	A) Prior to the commencement of Project Works involving excavation, the Proponent must undertake predictive modelling of the potential for groundwater drawdown. The predictive modelling must be based on validated monitoring data and must address the likely extent of any drawdown over time, up to the time when such movement reaches equilibrium.	<i>Water Quality Management Plan – REF (WQMP)</i>																					
	B) Project Works must be designed, planned and implemented to avoid where practicable and otherwise minimise the inflow of groundwater to the Project Works, including excavations, the underground stations and tunnels, having regard for the predictive modelling.	<i>WQMP</i>																					
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Condition 17 Surface Water	A) Project Works, and worksites, must be designed and implemented to avoid inundation from stormwater due to a 2 year (6hr) ARI rainfall event and flood waters due to a 5 year ARI rainfall event.	<i>WQMP</i>																					

CRRDA REFERENCE	REQUIREMENT	ADDRESSED IN SECTION
	B) Project works must be designed and implemented to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.	WQMP
Condition 22. Environmental Design Requirements (7. Climate change and sustainability)	B) The Project is designed to be adaptable to conditions that may arise as a result of climate change, including accommodating the predicted 1.0 m sea level rise scenario in 2100 (upper range).	<i>Sustainability Management Plan – REF (SuMP)</i>
	C) Sustainability initiatives, particularly in relation to energy consumptions and savings throughout the Project lifecycle are incorporated in detailed design and tracked via a Sustainability Tool (e.g. ISCA’s rating tool) through to Project implementation.	SuMP
	D) In design and construction, devise and implement a process for optimising energy efficiency in construction planning and delivery (e.g. component sourcing and transportation, spoil and materials handling – no double handling, programming to avoid re- work or redundant work).	SuMP

Details of Revision Amendments

Document Control

The CBGU Project Director is responsible for ensuring that this Plan is reviewed and approved. The Project Environment & Sustainability Manager is responsible for updating this Plan to reflect changes to the Project, legal and other requirements, as required.

Amendments

Any revisions or amendments must be approved by the CBGU Project Director before being distributed / implemented.

Distribution and Authorisation

The CBGU Project Director is responsible for the distribution of this Plan. The controlled master version of this document is available for distribution as appropriate and maintained on TeamBinder. All circulated hard copies of this document are deemed to be uncontrolled.

The implementation of this Plan is under the authority of CBGU Delegated Authority Matrix. All personnel employed on the Project will perform their duties in accordance with the requirements of this Plan, supporting management plans, and related procedures.

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Referenced Documents

The following provides a list of referenced documents either as a sub-plan to this plan or referenced from.

Table 2 Referenced Documents

Document Number	Document Name	Location of Controlled Version
Referenced Project Plans include:		
CRRTSD-EN-ENMP-CBGU-000026	Waste Resource and Recovery Plan	TeamBinder
CRRTSD-EN-MPL-CBGU-000019	Construction Environmental Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000011	Contaminated Land Management Plan	TeamBinder
CRRTSD-CU-MPL-CBGU-000018	Communications and Stakeholder Engagement Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000007	Hazard and Risk Management Plan	TeamBinder
CRRTSD-SU-MPL-CBGU-000031	Sustainability Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000006	Spoil Placement Management Plan	TeamBinder
CRRTSD-EN-ENMP-CBGU-000002	Waste Management Plan	TeamBinder
	Hydrology Design Report	This Plan

Note: this Management Plan may not contain the current version of the documents listed above. Refer to the 'location of controlled version' for the most current version.

Glossary of Terms

Table 3 Terms

Term	Meaning
BCC	Brisbane City Council
CBGU	D&C Contractor comprising a joint venture with CPB Contractors Pty Ltd, BAM International Australia Pty Ltd, Ghella Pty Ltd and UGL Engineering Pty Ltd
CCSMP	Climate Change and Sustainability Management Plan
CEMP	Construction Environmental Management Plan
CMS	CPB Management System
CRRDA	Cross River Rail Delivery Authority acting on behalf of the State
CRR TSD (the Project)	Cross River Rail - Tunnels, Stations and Development (TSD) Project
DTMR	Department of Transport and Main Roads (QLD)
FM	Facilities Manager
GIS	Geographic Information System
HVAC	Heating, Ventilation, Air Conditioning
ISA	Independent Safety Assessor
O&M	Operations and maintenance
OEMP	Outline Environmental Management Plan
PIC	Project Independent Certifier
PSTR	Project Scope and Technical Requirements
QR	Queensland Rail
RIS (or RIS Alliance)	Cross River Rail – Rail Integration and Systems Project Alliance
Risk matrix	A table used in the evaluation of risk severity that has likelihood and consequence as its axes with numbers and ratings applicable to each likelihood/consequence combination. For use in risk evaluation and Safety in Design reviews.
Risk register	A database containing Project risks, assessments, treatments and responsibilities
SPMP	Spoil Placement Management Plan
Subcontractor	Any company, body or person who is contracted to CBGU for the purpose of supplying plant and/or services
SuMP	Sustainability Management Plan
TeamBinder	Proprietary software used as part of the Project wide Electronic Document Management System
the Project (or CRR TSD)	Cross River Rail - Tunnels, Stations and Development (TSD) Project
WBS	Work Breakdown Structure - the hierarchical breakdown of a project into manageable portions of work, used to drive program, cost, work documentation and organisational structure
WMP	Waste Management Plan

Term	Meaning
WQMP	Water Quality Management Plan
WRRMP	Waste Resource Recovery Management Plan

1 Introduction

1.1 Purpose

The Design and Construction Joint Venture comprising of CPB Contractors Pty Ltd, BAM International Australia Pty Ltd, Ghella Pty Ltd and UGL Engineering Pty Ltd (CBGU D&C JV or CBGU) is responsible for delivering the Cross River Rail (CRR) Project (the Project) on behalf of the Cross River Rail Delivery Authority (the Delivery Authority).

This Climate Change and Sustainability Management Plan should be read in conjunction with the Project's overarching Construction Environment Management Plan (CEMP).

The CEMP provides specific details regarding the background of the Project, the scope of the Project and the staging and timing of key milestones associated with the construction of the Project.

1.2 Context

This Climate Change and Sustainability Management Plan (CCSMP) forms part of the Construction Environmental Management Plan (CEMP) developed for the construction of the Project. The CCSMP describes how the CBJU JV will manage and minimise potential and actual Climate Change and Sustainability impacts during construction of the Project.

1.3 Objectives

The objectives of this CCSMP are to achieve the environmental outcomes stated in the Outline Environmental Management Plan (OEMP) and the CEMP through the implementation of site-specific mitigation measures. It will also:

- A. Comply with sustainability and climate change requirements, including the achievement of 'Excellent' certified IS Design and As-Built ratings
- B. Comply with State Approval conditions that are relevant to Climate Change and Sustainability:
 - Sustainability initiatives, particularly in relation to energy consumptions and savings throughout the Project lifecycle are incorporated in detailed design and tracked via a SustainabilityTool (e.g. ISCA's rating tool) through to Project implementation
 - In design and construction, look for opportunities to pursue energy efficiencies in construction planning and delivery (e.g. component sourcing and transportation, spoil and materials handling), thereby potentially minimising energy demand and consumption
- C. Use of potable water by the Project is minimised, where possible and appropriate
- D. GHG emissions from the construction of the Project are minimised, where possible and appropriate
- E. Pursue opportunities, where appropriate to minimise some material use, and reuse recycled materials

1.4 Legislative Framework

1.4.1 Commonwealth Legislation

- *National Greenhouse and Energy Reporting Act 2007*
- *National Greenhouse and Energy Reporting Regulations 2008*
- *Environmental Protection and Biodiversity Conservation Act 1999.*

1.4.2 State Legislation

State legislation that is relevant to the Project and this CCSMP includes:

- *Building Act 1975*
- *Coastal Protection Management Act 1995*
- *Economic Development Act 2012*
- *Environmental Protection Regulation 2019*
- *Environmental Protection (Air) Policy 2008*
- *Land Act 1994*
- *Nature Conservation Act 1992*
- *Water Act 2000*
- *Waste Reduction & Recycling Act 2011*
- *Transport Planning and Coordination Act 1994*
- *Environmental Protection (Regulated Waste) Amendment Regulation 2018*
- *State Development and Public Works Organisation Act 1971*
- *City of Brisbane Act 2014*
- *Cross River Rail Delivery Authority Act 2016*
- *Explosives Act 1999*
- *Environmental Protection Act 1994*
- *Environmental Protection (Water) Policy 2008*
- *Local Government Act 2009*
- *Planning Act 2016*
- *Work Health and Safety Act 2011*
- *Waste Avoidance and Recovery Act 2001*
- *Water Efficiency Labelling and Standards Act 2005*
- *Environmental Protection (Waste ERA Framework) Amendment Regulation 2018*
- *Waste Reduction & Recycling (Waste Levy) Amendment Bill 2019*

1.4.3 Approvals, Permits and Licences

CBGU will obtain licences, permits and approvals as required by law and maintain them as required throughout the delivery phase of the project. No condition of the Infrastructure Approval removes the obligation for CBGU to obtain, renew or comply with such necessary licences, permits or approvals.

There are no specific licences or approvals that relate to climate change and sustainability. However, there are a number of approvals, permits and licences that indirectly relate to climate change and sustainability – for example ‘Waste Disposal Permits’. These have all been identified in both the relevant sub-plan and the approvals register contained within the overarching CEMP.

1.4.4 Guidelines and Standards

Guidelines and standards related to the management of climate change and sustainability include, but are not limited to:

- AS5534 – 2013 Climate Change Risk
- ISO31000 Risk Management - Principles and Guidelines 2009
- Australian Standard AS5334-2-13: Climate change adaptation for settlements and infrastructure
- National Strategy for Ecologically Sustainable Development (NSED)
- Toward Q2: Tomorrow's Queensland (Toward Q2)
- South East Queensland Infrastructure Plan and Program 2010 – 2031 (SEQIPP)
- Green Heart Program
- Australian Green Infrastructure Council
- Urban Development Institute of Australia EnviroDevelopment
- Sustainability Framework Elements
- Queensland Climate Adaptation Strategy 2017-2030
- CPB Management System: Sustainability Data Collection Procedure which encompasses managing energy and subcontractor fuel use procedures
- ISCA Climate Change Risk Assessment.

2 Required Outcomes

2.1 Coordinator-General Conditions

The Imposed Conditions do not contain any specific climate change or sustainability requirements that have not already been addressed in the Sustainability Management Plan (SuMP). However, in complying with the Imposed Conditions more broadly, the Project will also achieve the below and the nominated Climate Change and Sustainability Objectives.

Condition 13 – Air Quality

- A. Project Works must aim to achieve the goals in Table 4 below.

Table 4 Air quality criteria and goals

Criterion	Air Quality Indicator	Goals	Averaging Period
Human Health	Total Suspended Particulates (TSP)	90 µg/m ³	1 year
	Particulate Matter (PM)	50 µg/m ³	24 hours
		25 µg/m ³	1 year
Nuisance	TSP	80 µg/m ³	24 hours
	Deposited dust	120 mg/m ³ /day	30 days

- B. During construction, monitor and report on air quality in accordance with the AQMP, a sub-plan of the CEMP.

Schedule 1 – Environmental Design Requirements 11 - Waste

- A. The Project is designed to minimise waste generation and maximise the reuse and recycling of waste materials generated by the Project during its construction and operation
- B. Opportunities are investigated during the detailed design phase for the use of recycled materials, including for Project infrastructure produced from concrete, road base, asphalt and other construction materials
- C. During detailed design, the feasibility of re-using material excavated from the Project is investigated.

Condition 16 – Water Resources

- A. Prior to the commencement of Project Works involving excavation, the Proponent must undertake predictive modelling of the potential for groundwater drawdown. The predictive modelling must be based on validated monitoring data and must address the likely extent of any drawdown over time, up to the time when such movement reaches equilibrium
- B. Project Works must be designed, planned and implemented to avoid where practicable and otherwise minimise the inflow of groundwater to the Project Works, including excavations, the underground stations and tunnels, having regard for the predictive modelling
- C. The Proponent must monitor the inflow of groundwater to the Project Works and compare monitoring data with the predictive modelling. If the rate of groundwater inflow rate exceeds 1L/sec in any

worksite, the proponent must revise work methods and devise and implement mitigation measures as soon as practicable.

Condition 17 – Surface Water

- A. *Project Works, and worksites, must be designed and implemented to avoid inundation from stormwater due to a 2 year (6hr) ARI rainfall event and flood waters due to a 5 year ARI rainfall event*
- B. *Project works must be designed and implemented to avoid afflux or cause the redirection of uncontrolled surface water flows, including stormwater flows, outside of worksites.*

Condition 22 – Environmental Design Requirements 7 – Climate Change and Sustainability

- B. *The Project is designed to be adaptable to conditions that may arise as a result of climate change, including accommodating the predicted 1.0 m sea level rise scenario in 2100 (upper range)*
- C. *Sustainability initiatives, particularly in relation to energy consumptions and savings throughout the Project lifecycle are incorporated in detailed design and tracked via a Sustainability Tool (e.g. ISCA’s rating tool) through to Project implementation*
- D. *In design and construction, devise and implement a process for optimising energy efficiency in construction planning and delivery (e.g. component sourcing and transportation, spoil and materials handling – no double handling, programming to avoid re- work or redundant work)*

2.2 Environmental Outcomes

The following environmental outcomes in relation to Climate Change and Sustainability are to be achieved for the Project:

- A. Ensure through design that the Project is adaptable to conditions that may arise as a result of climate change
- B. Ensure that the Project design minimises energy demand and lifecycle energy consumption.

2.3 Performance Criteria

The following performance criteria in relation to Climate Change and Sustainability must be achieved throughout construction of the Project:

- A. The Project design accommodates the predicted 2100 sea level rise
- B. The Project design achieves specific energy efficiency and resource efficiency measures
- C. Where possible and appropriate, use of potable water by the Project is minimised
- D. Where possible and appropriate, opportunities are pursued to reuse recycled material and to minimise some material use

3 Impacts and Mitigation Measures

3.1 Impacts

Broadly, the following potential impacts without controls are relevant to climate change and sustainability during construction (controls are discussed in Section 3.2):

- Elevated ambient temperatures, increased humidity, more frequent/ pronounced heat waves reduces Heating, Ventilating and Air Conditioning (HVAC) efficiency, reduces HVAC operational life, increases electricity demands beyond forecasts
- Inundation of underground stations and critical infrastructure (e.g. Albert St, Mayne Rail Yard adjacent to Breakfast Creek) due to future rising sea water levels/storm surge/river flood
- Elevated ambient temperatures, humidity and more frequent/pronounced heat waves require increased plant room sizes for HVAC system upgrades (assuming no size reductions in future) in 100 years
- HVAC power demands during future heatwaves unable to be accommodated by local mains supply resulting in power disruption to asset operations, reduced patron satisfaction
- Loss of service & cost of replacements from damage to transformers and power distribution assets resulting from more intense & damaging storm events (wind, lightning, flooding)
- Localised flooding of assets and increasing maintenance due to precinct drainage not coping with increased rainfall intensity rainfall events
- Accelerated deterioration of station building facades and hard landscaping from increased temperatures, frequency of heatwaves, solar radiation reducing design life & extra replacement costs
- Accelerated deterioration of station building facades and hard landscaping from more intense storm and hail events (including wind, lightning)
- Increases in atmospheric CO₂ increases carbonation and corrosion of concrete structures reducing design life.

3.2 Mitigation

- The primary mitigation measure being employed by the Project to achieve the identified Performance Criteria and Environmental Outcomes is the SuMP. This document describes how CBGU will:
 - Comply with sustainability requirements, including the achievement of 'Excellent' certified IS Design and As-Built ratings (from the Outline Construction Environmental Management Plan – Outline Climate Change and Sustainability Management Plan (OCCSMP) p.7)
- The SuMP details the Projects mitigation, monitoring and reporting initiatives in relation to:
 - Climate resilience
 - Materials and Resource Reduction
 - Energy and Carbon Reduction
 - Water Reduction and Sourcing

- Green Office
- IS Rating Management (OCCSMP p.7)
- The Project will seek to re-use spoil on the Project or for other projects, subject to requirements of the Commonwealth Government with regards the referral made pursuant to the *Environment Protection and Biodiversity Conservation Act 1999*. Refer to the Spoil Placement Management Plan (SPMP) and Waste Resource Recovery Management Plan (WRRMP) (OCCSMP p.7)
- Management measures proposed to avoid and reduce, re-use and recycle material are included in the Waste Management Plan (WMP) and associated WRRMP (OCCSMP p.7)
- The Project has been designed to achieve immunity for a predicted 1.0 m sea level rise scenario in 2100 as detailed in the Hydrology Design Report (OCCSMP p.7).

4 Compliance Management

4.1 Roles and Responsibilities

The organisational responsibilities and accountabilities in relation to environmental management throughout Project construction works are outlined in the overarching CEMP.

4.2 Induction and Training

4.2.1 Environmental Induction

All CBGU staff, subcontractors and visitors to worksites must attend general induction training that covers general environmental management requirements, site-wide controls and site-specific and work specific risks and mitigation measures. Further details regarding environmental induction requirements have been outlined in the overarching CEMP.

4.2.2 Environmental Training

Environmental Training such as Toolbox Talks and Awareness Sessions where the Sustainability Team will coordinate regular toolbox presentations and awareness sessions to facilitate a high performing sustainability culture is built into the project team. Documentation of toolboxes and awareness sessions, including sign on sheets will be retained. Details regarding environmental training requirements, including completion of Toolbox Talks, have been further outlined in the overarching CEMP.

4.3 Inspections, Monitoring, Auditing and Reporting

4.3.1 Environmental Inspections

The Contractor will undertake environmental inspections to develop and evaluate the effectiveness of environmental controls.

If any maintenance and/or deficiencies in environmental controls or in the standard of environmental performance is observed, they will be recorded on the Project's Environmental Checklist. A register of all corrective actions including due date, closed out date, item description and responsible person will be recorded in such a way as to be able to be generated into a register when required.

General inspection requirements are to be undertaken as nominated in the CEMP and the SuMP.

4.3.2 Environmental Monitoring

Monitoring will be undertaken at various sensitive receptors to validate the impacts predicted for the Project to measure the effectiveness of environmental controls and implementation of this CCSMP. The monitoring also helps in addressing any potential Community Complaints that may be made. The monitoring requirements for climate change and sustainability are outlined below:

- Monitor that measures are incorporated into the Detailed Design and that measures are followed through to construction and operation
- Regular monitoring (weekly) of the worksites for compliance with CCSMP developed during Detailed Design for the Project

- Monitor energy consumption and potable water use monthly
- Monitor the implementation of adopted sustainability requirements O (CCSMP p.9).

4.3.3 Environmental Auditing

Audits will be undertaken to assess the effectiveness of environmental controls, compliance with the CEMP, compliance with Environmental Design Requirements, and other relevant permits, approvals, and guidelines. There will be a monthly internal audit undertaken by CBGU as per the CEMP, who is to report findings to the Environmental Monitor and the Authority. This includes reporting on compliance with the CEMP and the Imposed Conditions.

Audits will be undertaken in accordance with the overarching CEMP.

4.3.4 Environmental Reporting

Reporting requirements and responsibilities are documented in the CEMP. Reporting requirements specifically associated with this CCSMP are outlined below.

- Half-yearly sustainability reporting for all relevant aspects and monitoring results for compliance with the OEMP.
- Energy consumption and potable water use to be reported on monthly.
- Maintain the Sustainability Tool for the Project, by auditing and reporting on the sustainability design requirements that have been incorporated into the final design.