James Davidson Architect: From Advocacy to Action

Emergency Architects Australia flood inspections

220 houses

60 Volunteer Architects

100 Volunteer Students

20 Volunteer Engineers

1200 families benefitted

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After the 2011 Queensland Floods

JAMES DAVIDSON ARCHITECT

Flood Resilient Housing

Graceville House

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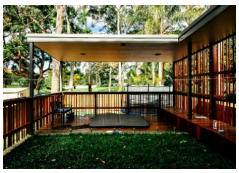
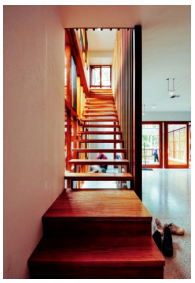
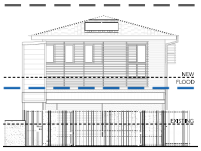
Flood Resilient Housing







Permeable elements and a plinth mitigate issues of scale and the streetscape after house raising

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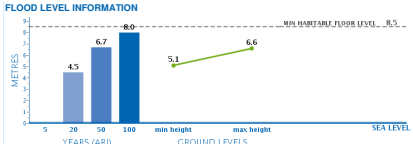
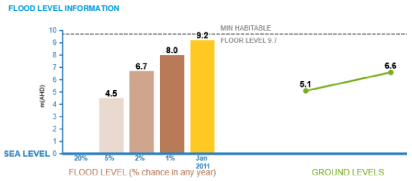
Brisbane City Council Reactionary Planning

2011



2015



Reactionary policy at its finest.

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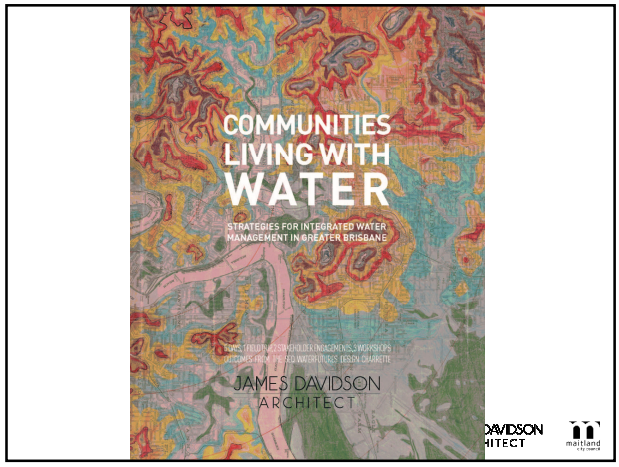
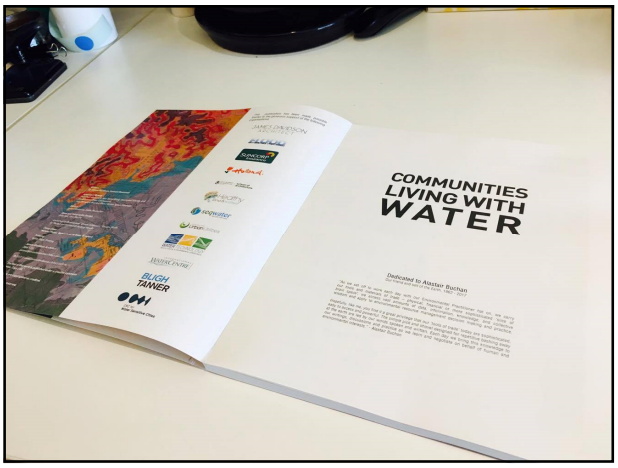
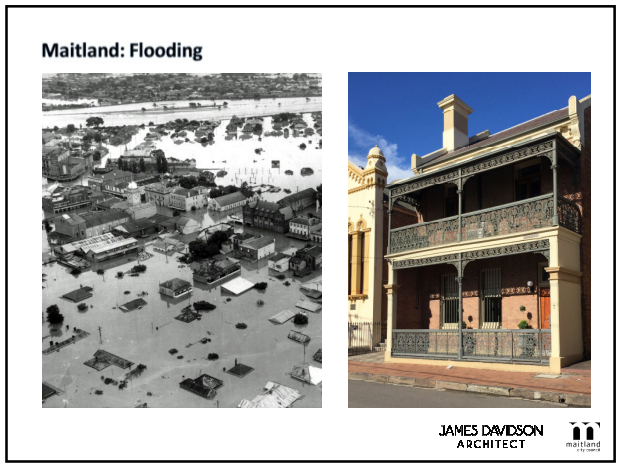
ACCOMMODATING WATER

ADAPTIVE ARCHITECTURES, REACTIONARY PLANNING AND DESIGNED RESILIENCE IN THE USA, NETHERLANDS AND UK

CHURCHILL FELLOWSHIP FINAL REPORT - DECEMBER 2013
DR. JAMES DAVIDSON
2012 CHURCHILL FELLOW


COMMUNITIES
LIVING WITH
WATER
STRATEGIES FOR INTEGRATED WATER MANAGEMENT IN GREATER BRISBANE
JAMES DAVIDSON
ARCHITECT


COMMUNITIES
LIVING WITH
WATER
BLIGH
TANNER


Maitland: Flooding
JAMES DAVIDSON
ARCHITECT

Maitland and JDA: Heritage Principles and Strategies

Principles

Character *of street front should be maintained and enhanced*
Scale *building envelopes to preserve and build on existing streetscape character*
Form *should complement the existing buildings in the area*
Materials *used should be common to the area*
Siting *should provide access to pedestrians and vehicles in a way which adds to street character*
Programme *non-habitable space ambiguously to allow flexibility, affordability and evolution over time*

Strategies:

Character: *Use form as a background infill, creating another layer setback to the rear.*

Scale: *Create layers of datums corresponding to surrounding character/heritage (verandahs, floor levels, balustrades, sills, heads, eaves and ridge lines).*

Form: *Work with existing roofs, reflecting formal lines of contextual datums and terraces or; expand working with footprints of service buildings, sheds, water towers and their materiality and scale.*

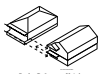
Siting: *Terracing concrete slab-on-ground to replace stumps, building on formal principle of datums*

Materials: *Elevated verandahs sitting on plinths to achieve reference datum levels.*

Programme: *Include non-habitable areas such as temporary work areas which potentially enliven the street and maintain connection with ground.*

Character: Rear Additions

Form: Side Additions


Scale: Reference Heights

Siting: Terracing

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Flood Principles and Strategies

Character *of streetscape can be used as a guide for implementation of resilient materials*
Scale *building envelopes to preserve and build on existing streetscape character*
Form *should complement the existing buildings in the area*
Materials *used should be water resistant and/or proof and allow permeability for ease of washing out water, following the principles of wet-proofing*
Programme *safe zones where property can be protected, no matter the scope of renovation, following the principles of dry-flood-proofing (elevation)*
Access *between levels to allow visual and physical connection between habitable and non-habitable zones*

Character: *Layering resilient materials as identified in the Hunter River Floodplain Development Control Plan*

Materials: *Use tiered blockwork/masonry/steel/fibre cement/hardwood timbers in hierarchy corresponding to heritage and flood condition. No cavities in envelope or between floors.Doors on ground floor as all openings*

Siting: *Use heritage terracing concept to allow access and resilience for various flood scenarios*

Programme: *Elevated Storage and Refuge. Include spaces in roof cavities or upper levels where property will be protected.*

Access: Voids
Voids as a means of gaining and light between floor levels, as well as activating programme establishing a direct connection between habitable and non-habitable areas

Programme: Elevated Storage

Access: Voids connecting habitable and non-habitable spaces

Siting: Flood Terraces

Materials: Material Heights

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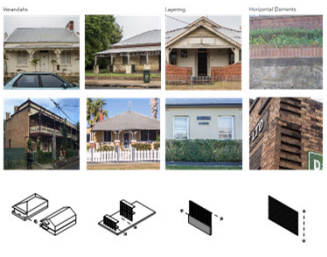
Flood and Heritage Synthesis

Character

Scale



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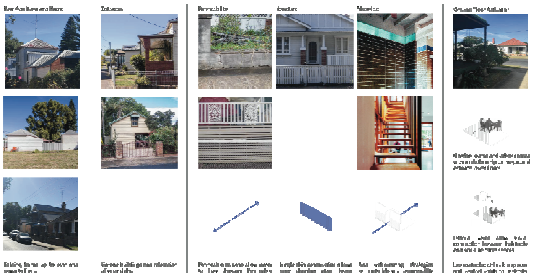
Flood and Heritage Synthesis

Form ***Siting*** ***Details*** ***Programme***



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Flood Resilient Material Palette: Below FPL

Building Element	Requirement	Notes
Part of Building Below the FPL		
Ground Floor Levels		
Ground floor levels to be established a minimum of 300mm above natural ground level	Preferred	• Provides some protection against low level more frequent flooding. • Provides for improved design response in heritage conservation areas.
Ground Floor Construction		
Concrete slab on ground	Preferred	
Infill concrete slab	Preferred	• This method allows for a higher ground floor level to provide increased protection against inundation from low level, more frequent flooding.
Ground Floor Finishes		
Float-finish Concrete	Preferred	• Allows for easier post-flood cleaning / hose-down.
Walls (external)		
Cavity brick	Not Recommended	• Cavities trap silt. They are difficult to clean out and lead to long term health issues through the build up of mould.
Single skin masonry (block & brick - solid/non-cavity)	Preferred	• Provide for ingress of water as above. • External surface of block or brick walls to be rendered and painted and may require architectural detailing if the building is being located within a heritage conservation area.
Lightweight Hardwood Timber Frame and Timber Cladding (Single Skin)	Preferred	• Hardwood timbers function well in flood events. • Consider lining walls with cladding on one side only so no cavity.
Solid concrete (tilt panel or formed in situ)	Acceptable	• Provide for ingress of water as above. • External surface of solid concrete walls may require architectural detailing particularly if the building is being located within a heritage conservation area.
Walls (internal)		
Single skin brick	Preferred	• These materials provide good structural performance when subject to
Solid concrete (tilt panel or	Acceptable	

Building Element	Requirement	Notes
formed in situ)		inundation and facilitate easier post-flood clean-up.
Wall finishes		
Exposed face brick	Preferred	• Rendering/ painting of masonry walls is acceptable however painting of walls may lead to increased dry-out time and the need for repainting.
Rendered/bagged finish – painted	Preferred	
Stairs (internal)		
Open stair treads in solid hardwood timber Minimum stair width 1000mm	Mandatory	• Solid timber hardwood treads better suited to immersion. • Stairway width to be suitable for ease of movement of personal belongings to first floor level in preparation for a major flood event.
Doors		
Solid core (external)	Preferred	• Solid core doors have generally improved response to immersion. • Solid core doors should be used in conjunction with removable hinges to allow them to be easily relocated to the first floor in a flooding scenario.
Solid core internal on removable hinges	Preferred	
Windows		
Aluminium or hardwood timber framing	Preferred	• In heritage conservation areas aluminium frame sections to resemble painted timber window treatment, otherwise hardwood timber preferred.
Ground Floor Cabinetry (for non-habitable spaces)		
Removable vanity cabinet	Preferred	• The cost of flooding can be further reduced if joinery items located on the ground floor can be relocated to the first floor in advance of inundation. • Ensure that flood resistant materials are used in cabinet construction.
Removable laundry cabinet(s)	Preferred	
Storage cupboards to be removable	Preferred	
Electrical Services		
Elevate switch board as high as possible at exterior of building	Mandatory	• Consult with electrical service provider to ensure that height of meter box is consistent with its requirements.
Ensure wiring is located as far as practicable within the roof space and as high as possible within walls.		• Ensure that all electrical design and installation is undertaken by licenced contractors and that all relevant design and installation standards are complied with.

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maitland city council

Flood Resilient Material Palette: Above FPL

Building Element Part of Building Above the FPL	Requirement	Notes
First Floor Levels[5]		
First floor levels to be established at or above the relevant flood planning level (FPL) for the site.	Mandatory	• Ensures a higher order of protection for a significant part of the structure in the 1:100 ARI flood event. • Provides for storage of all ground floor furnishings and personal effects above the 1:100 ARI. • Provides opportunity for residents to take refuge above the 1:100 ARI event until evacuation occurs.
First floor frame / structure		
Suspended concrete	Preferred	• Offers best performance in inundation event
Solid sawn timber frame	Acceptable	• Ensure drying to prevent decay – in some cases this might involve removal of ceiling to lower floor. • Allow for some loss of load bearing capacity when saturated. • Ensure adequate blocking to provide extra restraint and resist distortion. • Ensure good ventilation of enclosed areas to reduce the risk of timber decay. • Ensure use of either galvanised or stainless steel fasteners
Manufactured engineered beams	Acceptable	
Ground floor ceiling		
Fibre cement sheeting (eg villaboard)	Preferred	• In some cases removal of ceiling may be required to assist in drying of floor /ceiling framing. • Underfloor thermal or noise insulation should be avoided where possible. If inundation occurs it should be removed post-flood to assist drying.
First Floor Flooring		
Suspended concrete floor	Preferred	• Offers best performance in inundation event
Fibre cement sheeting	Preferred	• In these cases it is important that the floor framing be exposed post-flood to enable structural timbers to dry out.
Select plywood flooring with waterproof glue bond	Acceptable	

Building Element	Requirement	Notes
Walls to Upper Floors (external)		
Cavity brick	Preferred	• Offers best performance in inundation event and can be constructed as a vertical extension to the ground floor solid block or brick walls.
Brick veneer - timber framing	Preferred	• In these cases it is important that the wall framing (in whole or in part, be exposed post-flood to enable structural timbers to dry out – this usually involves removal of the lower section of internal wall sheeting. • Providing a 20-30mm gap between the bottom plate and the internal wall sheeting will provide access for cleaning the wall cavity and ventilation following a flood. • Ensure use of either galvanised or stainless steel fasteners.
Brick Veneer - steel framing	Preferred	• In these cases it is important that the wall framing (in whole or in part, be exposed post-flood to ensure that the steel frame sections are not ponding any water – this usually involves removal of the lower section of internal wall sheeting. • Holes will need to be drilled in the sides of the bottom plate channel to allow the channel to drain after a flood. • Providing a 20-30mm gap between the bottom plate and the internal wall sheeting will provide access for cleaning the wall cavity and ventilation following a flood.
Clad frame - timber	Acceptable	• In these cases it is important that the wall framing (in whole or in part, be exposed post-flood to enable structural timbers to dry out – this usually involves removal of the lower section of external/internal wall sheeting. • Providing a 20-30mm gap between the bottom plate and the internal wall sheeting will provide access for cleaning the wall cavity and ventilation following a flood. • External cladding material should perform satisfactorily when subject to inundation. Sheeting that requires joints to be 'set' may need to be reset following inundation and dry-out. • Ensure use of either galvanised or stainless steel fasteners

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Proposals: Heritage Design in Flood Affected Areas

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6 sites, 15 designs

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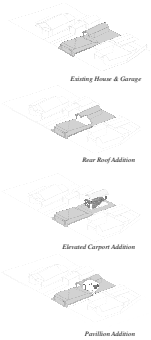
Hunter St Rear Addition



40 Hunter Street, Maitland
Site area: 325m2
Access: Hunter Street
Flooding depth: 1.7m

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Hunter St: Streetscape Analysis

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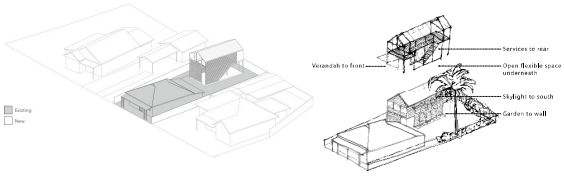
Hunter St: Garage Addition

Hunter St: Garage Addition



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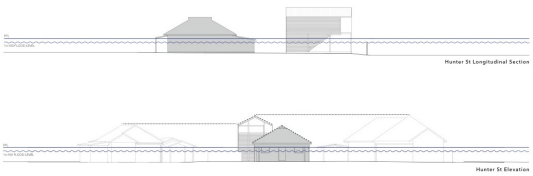
Hunter St: Garage Addition



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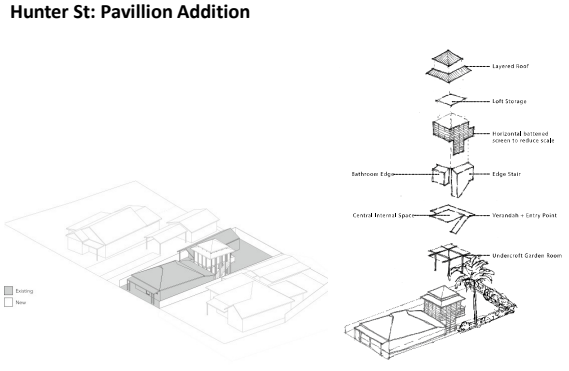
Hunter St: Pavilion Addition

Hunter St: Pavillion Addition



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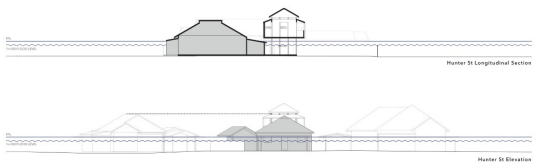
Hunter St: Pavillion Addition



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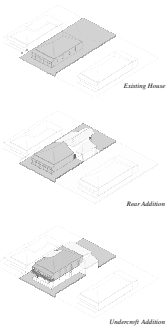
Charles St Rear Addition



49 Charles Street, Maitland
Site area: 583m2
Access: 49 Charles Street

Flooding depth: 2.7m

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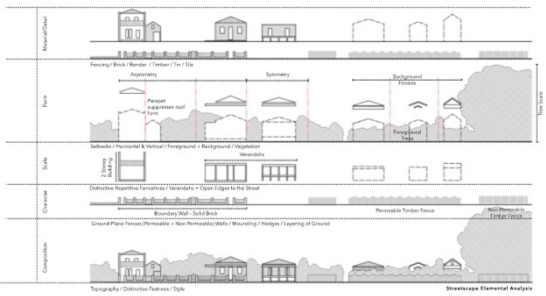
Charles St



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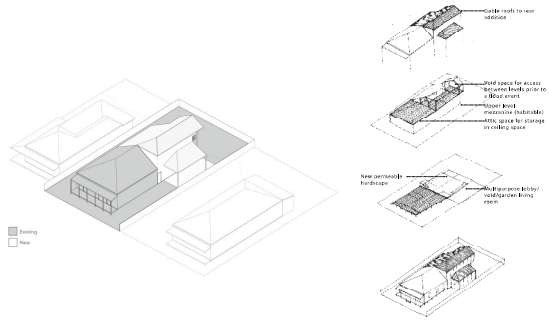
Charles St: Rear Addition

Charles St: Rear Addition



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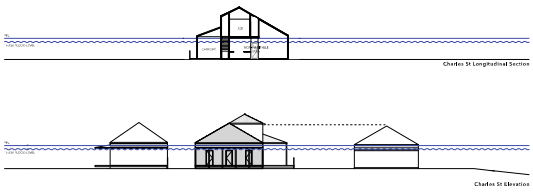
Charles St: Rear Addition



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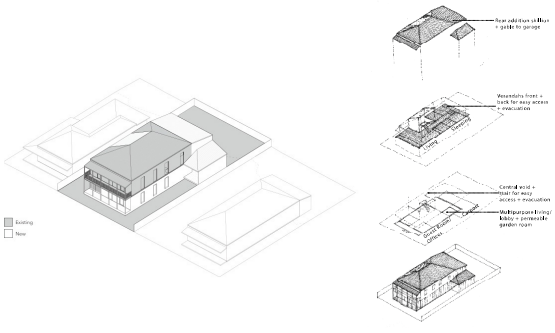
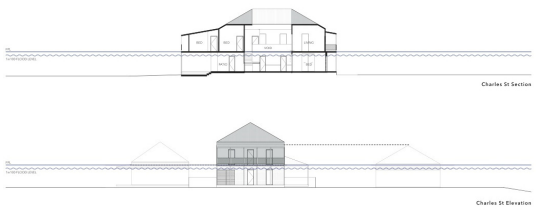
Charles St: Side Addition

Charles St: Side Addition



JAMES DAVIDSON ARCHITECT

Charles St: Side Addition



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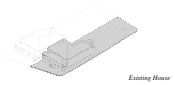
Carrington and James St Rear Addition



Existing House

Rear Addition

Corner James and Carrington Streets
Site area: 356m2
Access: Corner site: Vehicular access via James Street
Flooding depth: 2.7m

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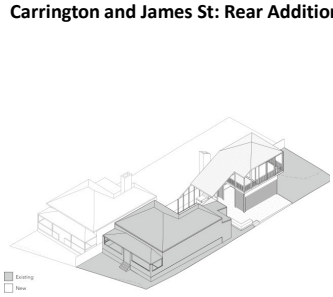
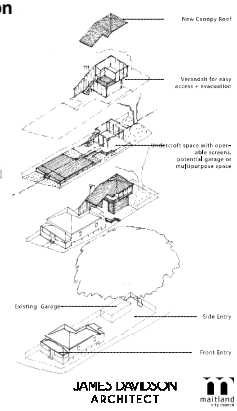
Carrington and James St

JAMES DAVIDSON ARCHITECT

Carrington and James St: Rear Addition

Carrington and James St: Rear Addition





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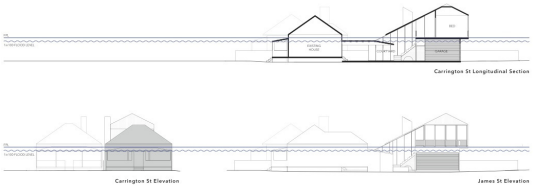
Carrington and James St: Rear Addition



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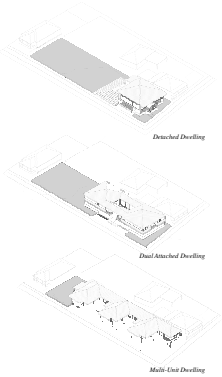
Carrington and Radford St: New Build



Carrington Street
Site area: 1110m2
Access: Corner Lot: Carrington Street and Radford Street
Flooding depth: 2.3m

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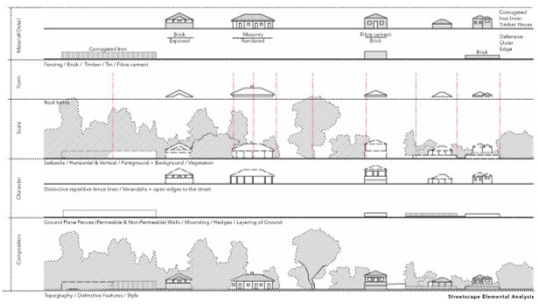
Carrington and Radford St: New Build



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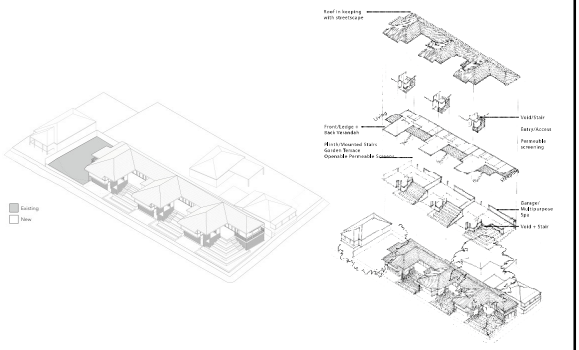
Carrington and Radford St: Multi-unit Dwelling

Carrington and Radford St: Multi-unit Dwelling

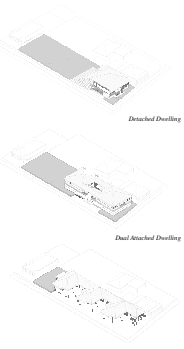


JAMES DAVIDSON ARCHITECT

Carrington and Radford St: Multi-unit Dwelling

JAMES DAVIDSON ARCHITECT

Catherine St New Build



24 Catherine Street, Maitland
Site area: 1,442m2
Access: Dual access: Catherine Street and Little Bourke Street

Flooding depth: 2.0m

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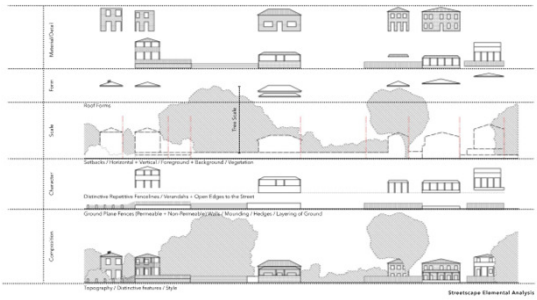
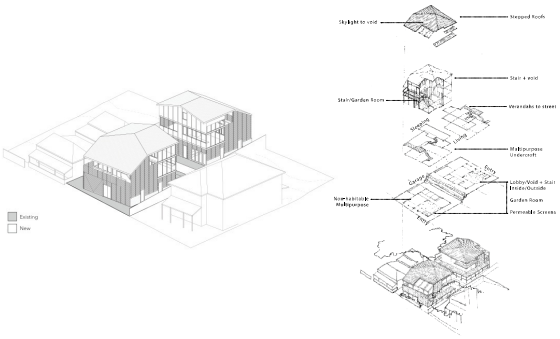
Catherine St New Build



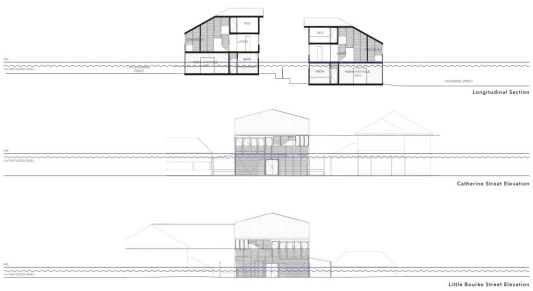
JAMES DAVIDSON ARCHITECT

Catherine St: Dual Detached Dwelling



JAMES DAVIDSON ARCHITECT

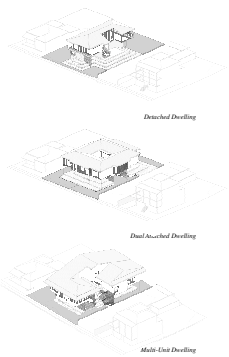
Catherine St: Dual Detached Dwelling



JAMES DAVIDSON ARCHITECT

Victoria St New Build

44-46 Victoria Street, Maitland
Site area: 812m2
Access: Victoria Street
Flooding depth: 3.9m



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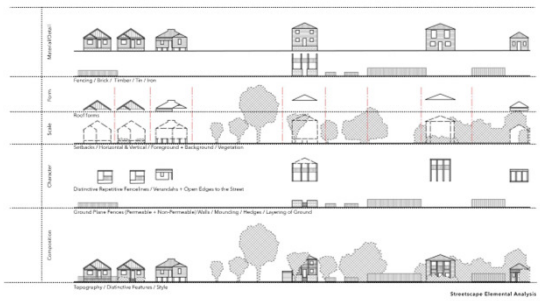
Victoria St New Build



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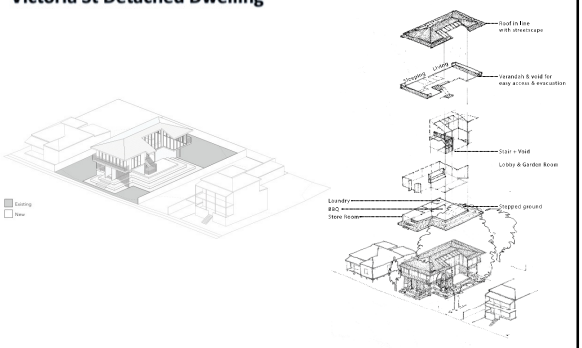
Victoria St: Detached Dwelling

Victoria St Detached Dwelling



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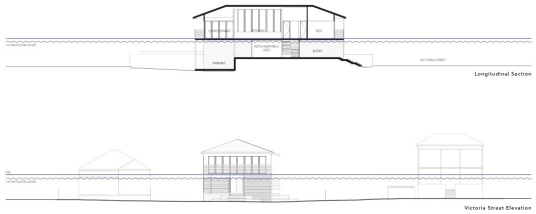
Victoria St Detached Dwelling



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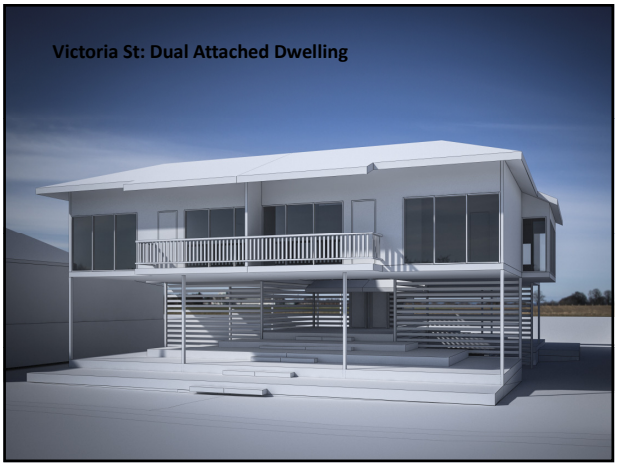
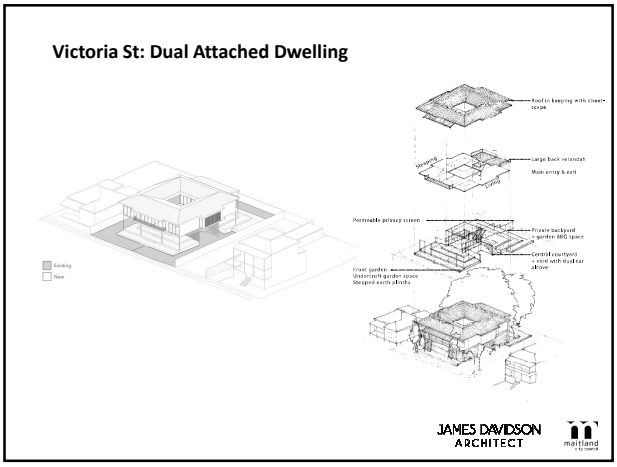

Victoria St: Dual Attached Dwelling


Victoria St: Dual Attached Dwelling
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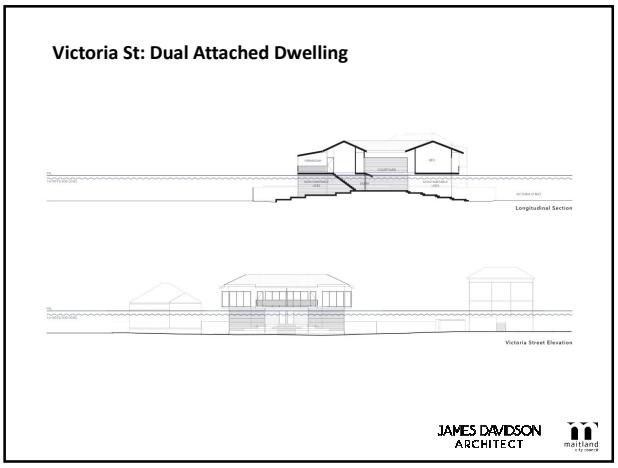
ARCHITECT


Victoria St: Dual Attached Dwelling
Longitudinal Section
Victoria Street Elevation
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maitland
city council
FLOOD LEVEL
1955