MACKAY REGIONAL COUNCIL
ENGINEERING DESIGN GUIDELINES

D20

DRAWINGS AND DOCUMENTATION GUIDELINES

Version 2020.06A (22 June 2020)

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VERSION NO	DESCRIPTION AND DISTRIBUTION	DATE	COMMENTS
2017.06A	ADAC ADDITIONS AND FORMATTING	02/06/2017	-
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PURPOSE

This Guideline sets out the requirements for drawings and documentation associated with infrastructure managed by Mackay Regional Council.

Drawings serve three main functions, which correspond to the different phases of a project:

1 (a) Detailing a design proposal and for design approval

(b) Documenting construction requirements

(c) Recording the actual works constructed

As a project progresses from one phase to another, drawings will be revised and identified according to the status of the project. Most of the requirements for the drawings will be common to all phases, however, there will be specific requirements applicable to only one or two phases (e.g. Detailing of "As-Constructed" information). These drawing guidelines have been set out to cover the general requirements for all drawings, followed by separate sections specifying requirements which may be unique to a particular phase.

GENERAL DRAWING REQUIREMENTS

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2.1 Minimum Drafting Requirements

Design drawings shall be definitive and clearly set out so that the project can be readily understood, specified for construction and satisfactorily built.

The information shown on the drawings shall be logically collected to avoid excessive cross-referencing between sheets.

Drawings should not be overcrowded with information and should not rely on colour printing (except for underground and overhead services) to impart information. They shall be clear and legible and prepared in consistent lettering and style.

The extent of the works to be constructed shall be clearly defined. Drawings shall differentiate between existing features, new construction and future works, by:

a) Using separate layers for existing, new and future works on electronic drawings
b) Using different line types for existing, new and future works
c) Showing the limits of work, including stage boundaries, location and details for joining new works to existing
d) Identify existing features and identifying structures that will be removed or replaced
e) Adding notes to identify existing or future works.

Drawings should be designed at A1 size and scaled accordingly to allow easy use and interpretation.

Unless approved otherwise, all drawings shall be provided in electronic PDF and DWG formats using AutoCAD software or an approved equivalent. Although drawings are created electronically, their most common use will be hard copy format and it is essential that drawings are legible and information interpretable when printed.

Council will not accept drawings that do not meet these drafting guidelines. Drawings copied from other works will not be accepted. All drawings shall be clearly referenced with notations and tabled as appropriate.

2.2 Size of Plan

All plans shall be drawn in metric standard A1 size and the lettering size must comply with AS1100.

Alternate plan sizes, however, may be accepted by exception, with Council approval sought prior commencement.

Design drawings issued "For Construction" shall be provided in metric standard A1 format, certified by the designer/checker/verifier and the relevant Registered Professional Engineer (RPEQ), in electronic PDF and DWG format files.

"For Construction" PDF files shall be provided as individual PDF files per plan generated with digital signatures from the designer/checker/verifier and the relevant supervising Registered Professional Engineer (RPEQ).

"As-Constructed" plans shall be provided in metric standard A1 format, certified by the designer/checker/verifier and the relevant Registered Professional Engineer (RPEQ), in electronic PDF and DWG format files.

"As-Constructed" PDF files shall be provided as individual PDF files per plan generated with digital signatures from the designer/checker/verifier and the relevant supervising Registered Professional Engineer (RPEQ) responsible for supervision of the construction.

*Note: a **Digital Signature** means a secured authenticated communication embedded in an electronic document generally using key encryption and not necessarily involving any copy of a conventional ink signature. It is considered a more secure form of signature.*

2.3 Order of Drawings

All design drawings shall be clearly numbered by the Designer with separate sheets numbered as part of a set. All drawing sheets shall have an allocated space in the bottom right hand corner for an assigned number provided by Council (7 characters).

Refer to Development Project "Operational Works" Drawing Requirements, Council Capital Works – Urban, and Council Capital Works – Rural for drawing order and content.

2.4 Scales

All plan details shall be drawn to an appropriate scale. For roadwork and stormwater drainage works, the scales shall comply with the following scales (or multiples of 10 or 100 of the scales), unless otherwise approved.

Acceptable Plan Scales			
1:1	1:2	1:2.5	1:5

The following scales are preferred for the plan types listed, but these may be varied as appropriate to the size of the project.

Plan Type	Preferred Scale
Plans	Urban 1:250 or 1:500 Rural 1:1000
Longitudinal Section	Horizontally, same as plan Vertically 1/10 horizontal
Intersection Detail	1:100, 1:200 or 1:250
Cross Sections	1:100 (natural)
Engineering/Construction Detail	1:10 or 1:20
Erosion and Sediment Control Management	1:500

No aspect of the plans shall be drawn “Not to Scale” or at an “Approximate Scale”.

All scales shall be bar scales.

2.5 Title Block

Each drawing shall have a title block and include, as a minimum, the following details:

a) Drawing Title – A short description of what is detailed on the drawing
b) Project Name – Council project title or name of Project then Estate Name. Where works are staged, include stage number.
c) Development / Estate Name (if applicable)
d) Plan, Sheet and revision number.
e) Drawing Number – Plans for Project works to make provision for Council drawing number in the bottom right hand corner.
f) Schedule and date of amendments.
g) Bar scales
h) Level and co-ordinate datum.
i) Provision for names and signatures, particularly the Certifying Engineer with RPEQ number and date of certification.

Where the project has been prepared on behalf of Council, the drawing shall be presented on Council standard drawing sheet and title block. The appointed Consultant may add their own title block in the bottom-right corner where the certifying RPEQ must print their name and number and add their signature.

2.6 Council Drawing Numbers

Where the project has been prepared on behalf of Council, the Designer shall provide a list of project descriptors (e.g. street numbers) and title descriptions to their relevant Council contact and obtain Council’s drawing numbers from the Design Services program prior to “For Construction” issue.

Where projects are prepared for private projects as part of a development application, provision shall be made for inclusion of a Council plan number within the title block.

2.7 Levels and Co-ordinates

Date Project Initiated	Project Type	Datum
Prior to 1st July, 2020	• Council "Capital Works" • Development "Operational Works"	**MGA94 ZONE 55** (GDA94, UTM Zones) **AHD71**
1 July 2020 –	• Council "Capital Works" • Development "Operational Works"	**MGA2020 ZONE 55** (GDA2020, UTM Zones) **AHD71**

All referenced Permanent Survey Marks shall be accurately shown and labelled on the plans.

Layout plans shall be drawn spatially accurate and display a North Point.

2.8 Dimensioning on Plans

2.8.1 General

Linear dimensions on all roadwork and drainage plans shall be in metres, excepting some detail plans of small structures (e.g. manholes) and some standard plans (e.g. kerb and channel) which may be in millimetres.

2.8.2 Chainages and Offset Dimensions

Chainages and offset dimensions on plans shall be expressed to 0.01 m (0.005 m may be used as the order of accuracy requires).

2.9 Line Styles and Fonts

Line styles and font types shall comply with Council's standard drafting details, namely:

- Text Style – Standard AutoCAD, Font Arial/Width 1.0.
  (All text shall be UPPERCASE with minimum height of 2.75 mm (unreduced))
- Line work – Line type and colour of all line work shall be in accordance with Council's standards.

Council's standard pen mapping details are shown in mrc pen mapping.pdf

2.10 Precision

Reduced levels for roadworks, water, sewerage, and drainage projects shall be expressed to three (3) decimal places (i.e. 0.001 m).

Road and drainage pipe grades shall be shown as a percentage to two (2) decimal places (i.e. 0.01%).

Reduced levels of water/sewer trunk and reticulation mains shall be expressed to three (3) decimal places (i.e. 0.001 m).

2.11 Drawing Layers

All identifiable features shall be shown on separate layers in accordance with Council's standard drafting details. Council's standard attribute design layers are shown in mrc design layers.pdf and detail layers are shown in mrc survey codes and layers.pdf

Any changes made to a drawing, as the project progresses, shall only be made on the appropriate layer(s) for the feature that has been modified.

2.12 General Survey Requirements

All engineering surveys which form the basis of plans submitted to Council, shall comply with the following:

2.12.1 Work must be carried out by a Registered Surveying Person

All survey detail provided shall be certified as accurate by a "surveyor" registered with the Surveyors Board of Queensland (SBQ) as either: a Surveying Associate, Surveying Graduate or Surveyor.

2.12.2 Survey Codes

When picking up detail, all points shall be coded in accordance with Council's Standard Survey Codes. Council's standard survey codes and layers are shown in mrc survey codes and layers.pdf

2.12.3 Required Data / Projection

The required horizontal datum and vertical datum for surveys within the Mackay Regional Council area are:

- Horizontal Control Surveys Datum/Projection — **MGA2020 ZONE 55** (GDA2020, UTM Zones)
- Vertical Control Surveys Datum — **AHD71**

The origin of the horizontal datum and vertical datum shall be indicated on the survey field notes when the project is being undertaken on behalf of Council.

2.12.4 Survey Marks

Connections to existing permanent survey marks shall be made to ensure marks which may be disturbed or damaged are identified before construction commences.

Marks used as control stations shall be of a durable nature. Acceptable survey stations include:

- Galvanized Iron Roofing Nails 30 mm or greater in length, placed in kerb, near the edge of concrete paths, or in substantial concrete structures.
- Spikes 90 mm or greater in length, placed in bitumen
- Iron Pins (⌀16 mm) 600 mm or greater in length, buried a minimum of 100 mm below the surface in average ground
- Iron Pins (⌀16 mm) 300 mm in length, buried a minimum of 100 mm below the surface in very hard or difficult conditions

Dumpy pegs are not acceptable survey stations for detail and as constructed surveys.

2.12.5 Accuracy Specifications for Conventional Instrument Surveys

- Datum shall be established by connecting to existing permanent survey marks designated as "Datum" or existing permanent survey marks with "Derived" coordinates of 2nd order/class B or better in Queensland's survey control database. Where existing control does not exist, as a minimum, datum shall be established by using the GNSS equipment and observation techniques (excepting double occupations) for real-time surveys as per the *Guideline for Control Surveys by GNSS*[*].

- The azimuth shall be established from the end coordinates of the longest observable line in the control traverse. When using real-time GNSS, this distance should normally be greater than 200 m and never less than 100 m.
- All survey stations shall be traversed using the equipment recommendations and observation techniques for SU < 10 mm and RU < 10 mm or 30 ppm as per the *Guideline for Conventional Traverse Surveys*[*] A current (within 12 months) EDM Calibration Certificate for the instrument used must be provided on request.
- All survey stations and bench marks shall be levelled using the differential levelling equipment recommendations (excepting staff calibration) and observation techniques for 12 mm * √k (km) as per the *Guideline for Control Surveys by Differential Levelling*[*]
- The farthest distance measured from a setup station to a feature (sideshots) shall not exceed 100 m to achieve height accuracy. In general, the relative uncertainty of 95% of reduced levels on hard structures shall not exceed 10 mm and on natural surface shall not exceed 25 mm. Refer to the survey brief for specific requirements.

2.12.6 Accuracy Specifications for GNSS Surveys

Total Station equipment shall be utilised on all surveys:

- Less than 1 km in length in rural areas
- Less than 2 km in length in urban areas
- For drainage/stormwater where the terrain is flat

For large-scale projects GNSS equipment may be used with prior approval from the MRC Survey Coordinator

Survey Element	Survey Uncertainty*
Horizontal Position	< 50 mm
Ellipsoidal Height	< 80 mm

* (95% confidence interval)

AHD71 GNSS derived heights shall be obtained by applying the AusGeoid09 separation model to the ellipsoidal heights.

2.13 Amendments/Revisions

All amendments / revisions are to be noted on design drawings and updated electronic copies submitted to Council expeditiously.

[*] As defined by Intergovernmental Committee on Surveying and Mapping (ICSM) Standard for the Australian Control Network Special Publication 1 (SP1) Version 2.1 October 2014 – www.icsm.gov.au

DEVELOPMENT PROJECT "OPERATIONAL WORKS" DRAWING REQUIREMENTS

3.1 Project Drawing Requirements

The Drawing Set shall typically include:

3.1.1 Locality Plan

The locality plan shall include:

- Location of the project in relation to nearby major streets and roads, intersections, highways, etc.
- The estate layout and staging details
- North point

3.1.2 Layout/Staging Plan

For large projects, the layout plan should show the relationship of all new roads to each other, and to existing roads adjoining the project. All adjacent structures and services shall be shown.

Where the project is to be carried out in stages, the boundaries of proposed stages should be shown on this plan and the stages identified by numbering. For small projects, where all new roads can be shown on one detail plan, the layout plan may be omitted.

3.1.3 Earthworks Plan

The earthworks plan shall include:

- Existing site contours and finished surface contours. (Spot levels should be used to complement contours)
- Limits and levels of major site cut and fill - distinguished by hatching
- Locations of cut and fill batters relative to property boundaries
- Location and levels of retaining walls (if required)
- Batter slopes and treatments
- Appropriate flood levels in accordance with Council's Policies
- Vegetation including trees proposed to be removed and those to be retained
- Location(s) and level(s) of permanent survey mark(s), reference stations etc. used as datum for the works
- Legend
- North point
- For smaller projects, the earthwork details may be included on the Roadworks and Drainage Plans

3.1.4 Roadworks and Drainage Plans

The roadworks plan shall include:

- Centreline or other construction line, including bearings and chainages. Set out co-ordinates tables shall be shown on a separate drawing
- All horizontal curve details – including radius, arc length, design speed and maximum superelevation – shown as near as practical to the relevant curve
- Chainages of all tangent points on curves

- Chainage and intersection angle of the Intersection Point of road centrelines or construction lines
- Kerb lines (including kerb type), kerb radii and tangent points on the kerb line
- Footpath and cycle ways, including perambulator (Pram ramps) crossings
- Edge of pavement where no kerb is to be provided
- Property accesses when required to be constructed
- Line marking, including type and colour (where appropriate)
- All permanent signs, including warning, directional and street nameplates. Each sign is to be specifically sized and coded in accordance with the standard referred to in the Queensland MUTCD
- Guide posts, guard rail
- Fencing
- Dimensions on road reserve and facilities where they are not to be constructed in accordance with standard details shown on the type cross section
- Existing and finished surface contours, highlighting cut and fill areas
- Location of existing utilities and other existing works within the site – including adequate clearance at service crossings
- Drainage line locations, pipe diameter and type
- Flush points for sub-soil drains
- Drainage structures and structure number – e.g. ½ referring to structure 1 on line 2
- Riverine and Coastal erosion protection works
- Overland flow paths, including levels
- All easements, including widths
- Road reserve boundaries and street names
- Lot numbers (both existing and proposed), or existing street numbers, and property boundaries
- Location and reference details of all PSMs and reference pegs
- Legend
- North point

3.1.5 Longitudinal Sections of Roads

For each new or reconstructed road, a longitudinal section shall be provided showing:

- Chainage
- Existing surface
- Design road centre
- Cut or fill depths at each chainage
- Design road grade
- Location, length and radius of all vertical curves, including all crest and sag point locations
- Chainage and level of grade intersection points.
- Sections on control lines or superelevated curves (i.e. Pavement edges, kerb or lane edges) curve widening and superelevation details

3.1.6 Detail Plan of Intersection and Cul-de-Sac

Intersection detail plans shall include all the relevant information required for Roadworks and Drainage plans, as listed above, with additional details such as kerb levels on all kerb returns, pavement contours, channelisation works, line marking, signage and pram ramps.

3.1.7 Standard Cross section

For each new or reconstructed road, a typical cross section shall be provided showing:

- Road reserve width
- Pavement width including medians (as applicable)
- Cycleway and pathway widths
- Crossfall of the pavement and verge
- Pavement thickness and material profile, including wearing surface material details for the road, cycleway and pathway
- Type of kerb and channel
- Table drain details for rural roads
- Sub-soil drainage
- Batter slopes
- Standard cross section intervals - Urban and rural cross sections should be provided for roads at 20 m intervals and tangent points, with further reduction to 10 m or 5 m intervals where necessary due to horizontal or vertical curvature.

3.1.8 Cross sections of Roads

For each new or reconstructed road, a typical cross section shall be provided for each pegged chainage showing:

- Road reserve boundary
- Pavement centreline and/or other construction line
- Design cross section
- Crossfall of pavement/verge, pavement/verge widths, and pavement depths wherever these differ from the standard cross section
- Natural surface profile
- Control line
- Location of services (including power poles), any aspect of the pavement, verge, cycleway or pathway which varies from the standard details

3.1.9 Longitudinal Section of Drainage Lines

For each new drainage line (either pipes or open channel), a longitudinal section shall be provided showing:

- Chainage
- Existing surface
- Longitudinal grade of proposed drain
- Diameter/size, type and grade of pipe
- Design finished level and invert levels
- Hydraulic grade line and water surface levels
- Chainage of drainage structures, including any offsets
- Number of each drainage structure – including structure number and line number. To include reference to specific detail drawing where relevant
- Crossing of any other services, including service type, location, invert level, conduit diameter and material type of the pipe crossings.

3.1.10 Landscape Plan or Streetscape Plan

The landscape or streetscape plans shall include:

3.1.11 Site and Layout

- Proposed and existing contours at 5 metre intervals
- Outline of existing woodland, rainforest etc.
- Significant trees showing level at base and proposed levels, indicating which trees/vegetation are to be removed or retained
- Proposed layout of roadways including:
  - Kerb and channel
  - Traffic islands, roundabouts, traffic calming devices etc.
  - Stormwater drainage pits and manholes
  - Street lighting
  - Property boundaries
- Proposed street tree schedule and plant key for species identification
- Existing tree schedule and plant key for species identification
- Revegetation areas including extent, type, technique and erosion prevention proposals
- Existing parks, reserves etc.
- Existing watercourses, watersheds, gullies with 10 metre buffer zone to either side of creeks, where required
- Layout and numbering of individual lots, including street names
- Adjoining land uses, access corridors
- North point

3.1.12 On-Street Works

- Alignment and location of proposed concrete footpaths and bike paths
- Grass establishment areas
- Lighting proposals and street furniture, if appropriate

3.1.13 Traffic Islands and Roundabouts

- Alignment of kerb and channel and concrete backing to roadside kerb
- Soil mix type and depth
- Proposed planting layout and plant schedule, including species, number, size, set out, staking
- Mulch types and depth
- Irrigation proposals

3.1.14 Public Open Space

- Dimensions and landscape treatment to buffer zones
- Location and dimension of all off-road bikeways and pedestrian pathways, with trees at 15 metre intervals, showing size and species
- Location of boundaries to all parkland, reserves and easements, including fencing proposals and details of removable vehicle barriers
- Location and type of play equipment, if applicable, including type, extent and edge treatment to safety surfacing

- Proposed lighting
- Mounding, showing base, crown, levels and gradients
- Proposed furniture including benches, bins, BBQs, shade structures, signage
- Taps, drinking fountains, irrigation couplings
- Proposed planting and mulched garden beds
- Irrigation plan at 1:2000 scale

Detailed specifications will be required to cover all proposed works including the following:

- Play equipment and safety surfacing
- Planting schedule showing key, botanical name, common name, quantity, pot size, minimum height, comments
- Revegetation requirements
- Grass establishment
- Mulch
- Hard landscaping
- Furniture and lighting
- Irrigation, if applicable, including mainline and lateral pipes, type and size of pipe, BPD position and details, valve and sprinkler positions, type, controller cables, hydraulic data and watering programs

3.1.15 Services Plan

The services plan shall include:

- Kerb and channel or edge of pavement where no kerb is to be constructed
- Cross road conduits type and size
- Location of all service providers' infrastructure, including, but not limited to: pits, roadside cabinets, and pillars
- Accurate location of poles/street lighting
- Essential details of all roads, traffic facilities or public open space areas to be lit.
- Lux contours and street light pole details for intersection designs
- Mandatory requirements to be provided and demonstrated compliance of the design as specified in Appendix D of AS/NZS 1158.1.1 and Appendix E of AS/NZS 1158.3.1
- Service markers
- Road reserve boundaries
- Lot numbers and property boundaries
- Legend
- North point

3.1.16 Stormwater Catchment Plan/Drainage Calculations Tabulations

The stormwater catchment plan shall include:

- A plan of the development showing the road and allotment boundaries
- Existing and finished surface contours/levels to define the terrain and allow definition of the sub-catchments

- Contours/levels extending beyond the limits of the development site to fully define the limits of external catchments (existing and future catchments)
- Sub-catchment boundaries, labels and areas
- Line diagram of drainage line, manhole, gully and outlet locations
- Labelling of stormwater structures
- Overland flow paths
- Proposed easements
- Drainage calculation table, generally in a format in accordance with Queensland Urban Drainage Manual (QUDM), and is to include roadway approach flow width to each pit, depth of ponding at sag points and bypass flows
- North point

3.1.17 Miscellaneous Details

- Stormwater outlet structures, other than standard headwalls
- Manhole details where pipe alignments are critical for clearances or flow considerations
- Detail of Soil and Water Quality Management Structures
- Surcharge structures
- Overland drainage paths
- Footbridges
- Reservoirs
- Entry structures
- Retaining walls
- Buildings
- Any details or variations from standard drawings

3.1.18 Erosion and Sediment Control Strategy

The Erosion and Sediment Control Strategy for subdivisions shall include:

- A plan of development showing the road and property boundaries
- Existing surface and finished surface contours at an interval close enough to define terrain
- Contours shall extend beyond the limits of the development site to fully define the limits of external catchments
- Extent of clearing and trees to be removed
- Line diagram of drain lines and drainage structures
- The identification and location of all Erosion and Sediment control measures (i.e. catch drains, diversion drains, sediment traps, sediment basins etc.) that are proposed for the period when the site is disturbed
- Location of sensitive and restricted access areas
- Existing significant vegetation to be retained
- Revegetation works
- Calculations are to be submitted in accordance with QUDM
- North point

3.1.19 Sewerage Reticulation

The sewerage reticulation plan shall include:

- Location and size of existing sewers
- Invert levels of existing lines
- Location of other services which cross sewer lines
- Location of manholes with manhole numbers (including dimensions where not shown on alignment)
- Identification of allotments, which are currently sewered
- Finished surface contours sufficient to enable verification of house connection design
- Grading information for new sewer lines including distance between manholes, pipe grades, pipe diameter, pipe material and class of each pipe length
- Manhole cover type and class
- Manhole inlet types
- Locations and level of sewer house connections and type
- Details of pumping stations including location, inlet/outlet levels, overflow, cut-off levels, electrical switchboard layout and water supply, size of pumping plant
- Diameter, material class and route of pressure main(s); including air valve and scour valve locations
- Clear identification of any alterations/connections to existing sewers to be completed by Council. Costs of such works will not be borne by Council.
- Lot numbers and property boundaries
- Details of permanent survey marks including AHD from which levels are to be transferred
- Legend
- North point

3.1.20 Water Reticulation

The water reticulation plan shall include:

- Location and size of existing mains
- Location, size, material and class of new mains
- Location of other services which cross the mains
- Details of connection to existing mains
- Location of each bend
- The location of valves, hydrants, scours and caps, T's, reducers, etc.
- Road crossing conduit locations, size and class
- Water service connection details
- Details of pumping stations including electrical switchboard layout, pipe work details and pump details
- Lot numbers and property boundaries
- Legend
- North point

3.2 Development Projects "Operational Works" Submissions

The relevant drawing and documentation shall be submitted in accordance with Development Engineering Information Bulletins DE003 Submission of Drawings by Consultants for Operational Works and DE014 Development Engineering Planning Act Changes

COUNCIL PROJECT "FOR CONSTRUCTION" DRAWING REQUIREMENTS

4.1 General

Designs provided for Council works will require sufficient detail to allow Contract or Council construction staff to accurately set out the detail design.

Council's requirements for drawing content will vary depending on the type and size of the project.

- Council Capital Works – urban construction/reconstruction
- Council Capital Works – rural construction/reconstruction

The designer shall follow the design procedure flowchart *PRC-23.007* in the "MRC Consultants Pack" and ensure the design and deliverables are in accordance with the project's design brief. Access to the MRC Consultants Pack on MRC FileShare may be requested through the Manager of Council's Design Services Program.

4.2 Council Capital Works – Urban

The Drawing Set shall typically include:

4.2.1 Cover sheet, locality plan and drawing index

For LARGER projects only. ***NOT required for SMALL projects****.*

- Locality plan to locate the project in relation to nearby major streets
- Drawing index
- Standard drawings list
- North point

4.2.2 General Arrangement and Control line Set out

For LARGER projects only. For SMALLER projects include the following on 4.2.3 Layout Plan(s)

- Scale generally 1:500 or 1:250 (possibly 1:1000 for larger projects)
- Control line(s) set out coordinates tables – point no, easting, northing, chainage. *Set out points shall have unique point numbers, be at 20 m intervals on straights, 10 m intervals on curves and at tangent/special points. Do not show the control line set out point numbers in plan view.*
- Control line radii
- Roadwork, paths, fences design layout
- Stormwater structures only
- Survey stations
- Survey station set out coordinates table - point no, easting, northing, level, description. *The point number must be unique and match the survey station number unless approved otherwise by the MRC Survey Coordinator. MRC has strict specifications for survey stations. If any doubt exists regarding the veracity of a station, contact the MRC Survey Coordinator.*
- Label significant structures/features
- General notes
- Erosion and Sediment Control note – *refer to* 4.2.21 Erosion and Sediment Control Notes
- Property boundaries and easements
- Street names, real property descriptions, north point

- Sheet extents
- Drawing index (if required)

4.2.3 Layout Plan(s)

- Scale 1:250
- Extent of works
- Control lines, chainages
- Roadwork, paths, fences design layout
- Curve radii, tangent point symbols
- Construction annotation
- Label significant structures/features
- Stormwater structures only
- Kerb ramps located accurately
- Major controlling dimensions
- Existing trees to be retained
- Survey stations
- Property boundaries and easements
- Legend, street names, house numbers, north point
- Small details relevant to this drawing as space permits – *may include coordinated set out details for small islands (point no, easting, northing). Ensure point numbers are unique.*
- Note adjoining sheets

4.2.4 Levels plan(s)

This sheet generally negates the need for an intersection details plan showing design contours

- Scale 1:250
- Control lines, chainages
- Roadwork, paths, fences design layout
- Tangent point symbols
- Unique level point numbers. *Maximum separation between level points for urban projects = 10 m. Any variation from this requirement is to be confirmed by the MRC Design Coordinator. This requirement is not to be confused with the intervals of control lines, or long section or cross section chainages. Generally, point numbers are to progress from left to right across each section in the direction of chainage.*
- Design contours - *generally of the street surface only, possibly for other areas where extra detail is required for clarity*
- Label significant structures/features
- Stormwater structures only
- No trees
- Minimum annotation is required
- Survey stations
- Levels set out point legend
- Property boundaries and easements
- Street names, house numbers, north point

- Levels coordinated set out tables – point no, easting, northing, level *(if space permits, if not add to* 4.2.11 Levels tables plan(s)*)*
- Note adjoining sheets

4.2.5 Stormwater drainage and services plan(s)

Where irrigation, lighting details, and design water mains lead to this plan becoming cluttered consider detailing on separate sheets

- Scale 1:250
- Control lines, chainages
- Roadwork, paths, fences design layout
- Existing and design stormwater drainage
- Stormwater structure numbers, e.g. ½ referring to structure 1 on drain line 2, where structure 1 is to be at the top (i.e. first inlet) of the system
- Stormwater culvert sizes
- Stormwater structure set out table – structure no, point no, easting, northing, reference level, description *(if space permits, if not add to* 4.2.10 Stormwater drainage details plan. Ensure point numbers are unique.*)*
- Stormwater and services notes, including ALL Service Provider Requisition Numbers
- Stormwater structure set out point legend
- Subsoil drains and flush points
- Existing and design underground/aboveground services showing size and type, including water service connections and sewer house drains
- Invert levels of existing stormwater infrastructure (if not shown on long sections) for asset collection purposes
- Irrigation enveloper pipes with levels
- Lighting conduit with levels
- Construction annotation
- Survey stations
- Design water mains
- Label significant structures/features
- Existing trees to be retained
- Property boundaries and easements
- Services legend, street names, house numbers, north point
- Small details relevant to this drawing as space permits
- Note adjoining sheets

4.2.6 Signs and pavement marking plan(s)

- Scale 1:250 (preferred) or 1:500 – depending on level of detail
- Roadwork, paths, fences design layout
- Pavement marking to scale, legend is not required
- Pavement marking radii and tangent point symbols
- Existing and design signs
- Sign annotation to include Manual of Uniform Traffic Control Devices (MUTCD) code

- Sign images to be used (*legend may be more suitable if the plan area becomes cluttered with images)*
- Dimensions for pavement marking to allow accurate set out. *If pavement marking is too difficult to set out by dimensions on the plan, adopt coordinated set out points and associated table - point no, easting, northing. Ensure point numbers are unique.*
- Label significant structures/features
- Ergon poles
- Property boundaries and easements
- Survey stations
- Signs legend if required, street names, house numbers, north point
- Signs and pavement marking notes
- Raised Reflective Pavement Marker (RRPM), rumble bars, speed cushions, Tactile Ground Surface Indicators
- Small details relevant to this plan as space permits
- Note adjoining sheets
- *DO NOT show the control line and chainages or any other line work that may be confused with pavement marking*

4.2.7 Streetscape / landscape plan(s)

- Scale 1:250 (preferred) or 1:500 – *depending on level of detail*
- Roadwork, paths, fences design layout
- New and existing trees with key
- Trees to be removed
- Design streetscape furniture/features
- Services including lighting
- Landscape annotation
- Existing tree list
- Planting schedule showing key, botanical name, common name, quantity, pot size, minimum height, comments
- Landscape legend
- Irrigation details (if applicable). *For SMALLER projects only. For LARGER projects include with* 4.2.8 Irrigation plan(s)
- Relevant tables (if space)
- Property boundaries and easements
- Label significant structures/features
- Street names, house numbers, north point
- Small details relevant to this plan as space permits
- Note adjoining sheets

4.2.8 Irrigation plan(s)

For LARGER projects only

Where there is insufficient space on 4.2.5 Stormwater drainage and services plan(s) and 4.2.7 Streetscape / landscape plan(s) include irrigation details on this plan

4.2.9 Street works details plan

For LARGER projects only

Where there is insufficient space on layout plans, this plan may be used for streetworks details.

4.2.10 Stormwater drainage details plan

For LARGER projects only

- Non-standard stormwater structure details
- Stormwater and services notes, including ALL Service Provider Requisition Numbers
- Stormwater structure set out table – structure no, point no, easting, northing, reference level and description. *Ensure point numbers are unique.*

4.2.11 Levels tables plan(s)

- Levels coordinated set out tables – point no, easting, northing and level. *Ensure point numbers are unique*.

4.2.12 Street long section plan(s)

- Scale 1:500/50 generally, vertical exaggeration may be varied if necessary
- Control line chainages generally at 20 m intervals, and including vertical and horizontal curve tangent point chainages
- Control line natural surface levels, generally at 20 m intervals
- Control line design surface levels
- Earthworks volumes at 20 m intervals
- Cut/fill depths are not required
- Design grades, vertical curve lengths
- Horizontal curve data below long section
- Crest and sag points, intersection points
- Annotated surfaces

4.2.13 Pavement details plan

For LARGER projects only. For SMALLER projects include with 4.2.14 Cross sections plan(s)

- Plan scale to allow clear presentation of various pavement areas. Use clear, open hatching patterns.
- Surfacing and pavement design notes/legend
- Design traffic volumes
- Design subgrade CBR
- Control lines, chainages
- Roadworks, paths, fences design layout
- No trees
- Property boundaries and easements
- Street names, house numbers, north point
- Note adjoining sheets

4.2.14 Cross sections plan(s)

- Scale 1:100
- Minimum interval 20 m
- Detailed notes to fully describe the sections and changes to the sections throughout the project, including footpath treatments*. This negates the requirement for type cross sections.*
- Boxing
- Crossfalls and dimensions
- Design and existing stormwater culverts in section
- Offsets to stormwater culverts
- Services in section
- Sections at accesses which require non-standard driveway profiles
- Property boundaries
- Surfacing and pavement design notes, design traffic volumes and design subgrade CBR. *For SMALLER projects only. For LARGER projects include with* 4.2.13 Pavement details plan
- Batter slopes shall be shown in the format '4H:1V']
- *Do not provide 'annotated boxes' under sections*
- *Arrange sections to minimise the number of cross section sheets*

4.2.15 Stormwater drainage long sections plan(s)

- Scale 1:500/50 generally Drain line chainages, where chainage 00 is at the bottom (i.e. outlet) of the system
- Control line chainages, if relevant
- Design surface, invert levels and depth to invert
- Design discharge, HGL, water level
- Part/full flow velocity, culvert grade, size, class and installation type
- Structure numbers and description
- Services crossings/clashes annotated, with levels where known
- Loadings design note
- No intermediate invert levels or breakup of culvert lengths
- *Minor long sections may be included on* 4.2.5 Stormwater drainage and services plan(s) *where space permits*

4.2.16 Stormwater drainage calculations table plan(s)

- As per QUDM
- Includes hydrology and hydraulics calculations
- *Where space permits, the* Stormwater drainage calculations table plan(s) *and* Stormwater drainage catchment plan *can be on the same sheet*

4.2.17 Stormwater drainage catchment plan

- Standard scale to suit
- Labelled catchments and sub-catchments as per calculations table
- Line diagram of existing and design stormwater drainage system with labels
- Overland flow paths with direction arrows
- Nominate catchments as minor/major/both

- Proposed easements
- Property boundaries and easements
- Street names, north point

4.2.18 Lighting plan(s)

- Scale 1:250 (preferred) or 1:500 – depending on level of detail
- Control lines, chainages
- Roadworks, paths, fences design layout
- Pavement marking
- Services
- Design poles, luminaires, conduits
- Lighting annotation
- Illuminance contours and labels (for illuminance/intersection designs)
- Lighting and services legend
- Pole and luminaire schedule including lighting set out points. *Include unique point numbers in the table.*
- Lighting notes, including ALL Ergon Works Requisition Numbers
- Luminaire details notes/legend
- Design light category
- Maintenance schedule
- Property boundaries and easements
- Label significant structures/features
- Survey stations
- Street names, house numbers, north point
- Small details relevant to this drawing as space permits
- Note adjoining sheets
- Statement of compliance indicating that the design meets requirements of AS/NZS 1158.1.1 or AS/NZS 1158.3.1 as appropriate
- Design light technical parameters and comparison to relevant requirements of the applicable standard

4.2.19 Water Reticulation plan(s)

Water and Waste Services to nominate requirements when a separate drawing is required

4.2.20 Structural plan(s)

Council has no fixed requirements, however drawings are expected to conform to industry norms

4.2.21 Erosion and Sediment Control Notes

- Run ESC application within AutoCAD (*MRC software)*
- Complete relevant notes

4.2.22 Safety in Design Risk Register

- Complete Risk Register matrix *(MRC only, consultants to follow their own procedures)*
- Do not include empty rows

4.2.23 Additional notes and possible variations to the above list

- Text height = 2.75 mm generally, UPPERCASE, Arial font, width = 1
- Text height to the body of all tables = 2.75 mm. Tables are to include horizontal lines at 6 mm spacing to aid legibility
- Batter slopes shall be shown in the format '4H:1V'
- Aerial imagery is considered acceptable on Council "For Construction" plans only in these circumstances:
    - For all metes and bounds plans;
    - Where no survey has been provided
        - Note: Aerial imagery is not a suitable substitute for an accurate engineering survey;
    - Where aerial imagery has been specifically requested to be overlaid on a plan
- To aid clarity and readability, Council will accept coloured linework on plans for underground and overhead services, with the following conditions:
    - Layers, naming conventions and mapping files for coloured services are to suit those provided in the MRC prototype templates for CAD modelling, drafting and printing;
    - "Larger" projects (i.e. projects that have many or overlapping underground and overhead services contained within the site area) must have the services shown in colour.
    - Discretion is left to the Designer on "smaller" projects (i.e. projects that may only have one service within the site area) to show the service/s in either colour or black with correct standard line types.

Do not show the following on drawings:

- Redundant existing features, e.g. kerb and channel to be removed
- Existing contours unless requested
- Overhead electricity lines unless they have an impact on the design
- 'Greyscale' presentation of detail. All line work (with the exception of underground and overhead services) must be in black.
- Shading – Shading can be problematic with plan reproductions and should be avoided. Use open hatching if necessary.

4.2.24 Set out points and set out files

- Set out point numbers shall be unique within the project (i.e. each set out point number only occurs once). Where set out point numbers are shown in plan view they shall include an open circle at the point. Plan views including set out point numbers tend to become cluttered; care must be taken to ensure each number is legible.
- ALL set out points within the set out file shall have a height (z value) specified. Where a height is not applicable and would normally be omitted, the set out point shall include a "-999" value as the height
- MRC's requirement for electronic set out data, where the design involves the modelling of 3D geometric design surfaces and where machine control is likely to be used, is described in mrc 3d model data export to construction.pdf.

4.3 Council Capital Works – Rural

The Drawing Set shall typically include:

4.3.1 Cover sheet, locality plan and drawing index

For LARGER projects only. ***NOT required for SMALL projects****.*

- Locality plan to locate the project in relation to nearby major roads
- Drawing index
- North point

4.3.2 General Arrangement and Control line Set out

For LARGER projects only. For SMALLER projects include the following with 4.3.4 Type Cross Sections, Set out Tables, Access Details, Notes (*possibly multiple plans*)

- Scale – consider scale larger than 1:1000
- Control lines set out coordinates tables – point no, easting, northing, chainage. *Set out points have unique point numbers, be at 20 m intervals on straights, 10 m intervals on curves and at tangent/special points. Do not show the control line set out point numbers in plan view.*
- Control line radii
- Roadworks including edge of bitumen, kerbs and fences - design layout
- Survey station set out coordinates table - point no, easting, northing, level, description. *The point number must be unique and match the survey station number unless approved otherwise by the MRC Survey Coordinator. MRC has strict specifications for survey stations. If any doubt exists regarding the veracity of a station contact the MRC Survey Coordinator.*
- Label significant structures/features
- General notes, standard drawings list
- Erosion and Sediment Control note – *refer to* 4.3.10 Erosion and Sediment Control Notes
- Property boundaries and easements
- Road names, real property descriptions, north point
- Sheet extents
- Drawing index, if beneficial

4.3.3 Plan and Long Section(s)

4.3.3.1 Plan

- Scale 1:1000 generally, possibly 1:500
- Extent of works
- Control lines, plan chainages at 100 m and tangent points
- Roadworks, fences design layout
- Arc information – radius, tangent length, arc length
- Construction annotation
- Label significant structures/features
- Existing and design stormwater drainage
- Stormwater culvert sizes
- Existing and design underground/aboveground services showing size and type, including ALL Service Provider Requisition Numbers

- *Design water mains and other services may be required to be detailed on a separate sheet.*
- Existing and design signs
- Sign annotation to include MUTCD code
- Sign images to be used, *legend may be more suitable if plan area becomes cluttered with images*
- Existing trees to be retained
- Survey stations
- Property boundaries and easements
- Legend, services legend, road names, house numbers, north point
- Note adjoining sheets

4.3.3.2 Long Section

- Long section below Plan
- Long section vertical exaggeration generally 1/10, *may be varied if necessary*
- Control line chainages generally at 20 m intervals, and including vertical and horizontal curve tangent point chainages
- Control line natural surface levels
- Control line design crown levels
- Earthworks volumes at 20 m intervals
- *Cut/fill depths are not required*
- Type cross sections and extents
- Design grades, vertical curve lengths
- Bitumen tapers
- Crest and sag points, intersection points
- Annotated surfaces
- Stormwater details (incl. numbering) to be shown vertically above surfaces
- Horizontal curve data, guide posts and pavement marking shown below long section
- Horizontal curve data to include radii, curve widening and superelevation as applicable

4.3.4 Type Cross Sections, Set out Tables, Access Details, Notes (*possibly multiple plans*)

- Control lines set out coordinates tables – point no, easting, northing, chainage. *Do not show the control line set out point numbers in plan view. Ensure point numbers are unique*.
- Survey station set out coordinates table - point no, easting, northing, level, description. *The point number must be unique and match the survey station number unless approved otherwise by the MRC Survey Coordinator. MRC has strict specifications for survey stations. If any doubt exists regarding the veracity of a station contact the MRC Survey Coordinator.*
- General notes, standard drawings.
- Erosion and Sediment Control note – *refers to* 4.3.10 Erosion and Sediment Control Notes
- Typical access detail
- Access table including chainage, width, turnout radius, culvert notes, culvert offset, end wall details
- Type cross sections, scale generally 1:50, including:
    - Insets as required

- Boxing
- Crossfalls and dimensions
- Batter slopes shall be shown in the form '4H:1V'
- Surfacing and pavement design notes, design traffic volumes and design subgrade CBR

4.3.5 Intersection details plan(s)

- Scale 1:250 generally
- Roadwork, fences design layout
- Level point numbers if relevant, *refer notes at* 4.3.7 Levels tables plan(s)
- Design contours - generally of road surface only
- Property boundaries
- Road names, north point

4.3.6 Roadwork details plan

4.3.7 Levels tables plan(s)

- Levels set out tables – point no, level, chainage, link name
- *Notes on levels*
  - Se out point numbers must be unique.
  - Level point numbers are not required to be shown in plan view on rural projects, since the recommended plan scales are not suitable for presentation of level numbers.
  - The exception to this is on detail plans which would be expected to be at a more suitable scale
  - In an effort to reduce drawing numbers the levels table contains only the data required for record keeping purposes. Additional data is contained in the set out file. Refer notes at 4.3.13 Set out points and set out files.
  - Generally point numbers are to progress from left to right across each section in the direction of chainage
- Maximum separation between level points on rural road projects varies
  - 20 m maximum only on straights and large radius horizontal curves with constant vertical grades or large radius vertical curves.
  - Elsewhere to be 10 m maximum
  - Engineering judgement is required to provide enough points for the intent of the design to be achieved
  - This separation requirement is not to be confused with the intervals of control lines, or long section or cross section chainages

4.3.8 Cross sections plan(s)

- Scale 1:100
- Minimal annotation will be required – *important notes are shown on type cross sections*
- Control line
- Boxing
- Chainages and datum level
- Services in section shown as vertical line style only, e.g. -T-

- Sections at accesses which require non-standard driveway profiles
- Property boundaries if possible
- *Do not provide 'annotated boxes' under sections*
- *Arrange sections so as to minimize the number of cross section sheets*

4.3.9 Stormwater Drainage Cross Sections and Details

- Scale 1:100
- Sections through all cross road culverts
- Control line
- Culvert number, size, class, length, chainage
- Inlet and outlet levels
- Offset distances from control to end wall
- End wall types, critical dimensions and angles, and cut-off wall details
- Direction of flow arrow
- Catchment area to culvert
- Standard drawings note
- *Arrange spacing so as to minimise the number of cross section sheets*

4.3.10 Erosion and Sediment Control Notes

- Run ESC application within AutoCAD (*MRC software)*
- Complete relevant notes

4.3.11 Safety in Design Risk Register

- Complete Risk Register matrix *(MRC only, consultants to follow their own procedures)*
- *Do not include empty rows*

4.3.12 Additional notes and possible variations to the above list

- Text height = 2.75 mm generally, UPPERCASE, Arial font, width = 1
- Text height to the body of all tables = 2.75 mm. Tables are to include horizontal lines at 6 mm spacing to aid legibility
- Batter slopes shall be shown in the format '4H:1V'
- Aerial imagery is considered acceptable on Council "For Construction" plans <u>only</u> in these circumstances:
    - For all metes and bounds plans;
    - Where no survey has been provided
        - Note: Aerial imagery is not a suitable substitute for an accurate engineering survey;
    - Where aerial imagery has been specifically requested to be overlaid on a plan
- To aid clarity and readability, Council will accept coloured linework on plans for underground and overhead services, with the following conditions:
    - Layers, naming conventions and mapping files for coloured services are to suit those provided in the MRC prototype templates for CAD modelling, drafting and printing;
    - "Larger" projects (i.e. projects that have many or overlapping underground and overhead services contained within the site area) <u>must</u> have the services shown in colour.

- Discretion is left to the Designer on "smaller" projects (i.e. projects that may only have one service within the site area) to show the service/s in either colour or black with correct standard line types.

Do not show the following on drawings:

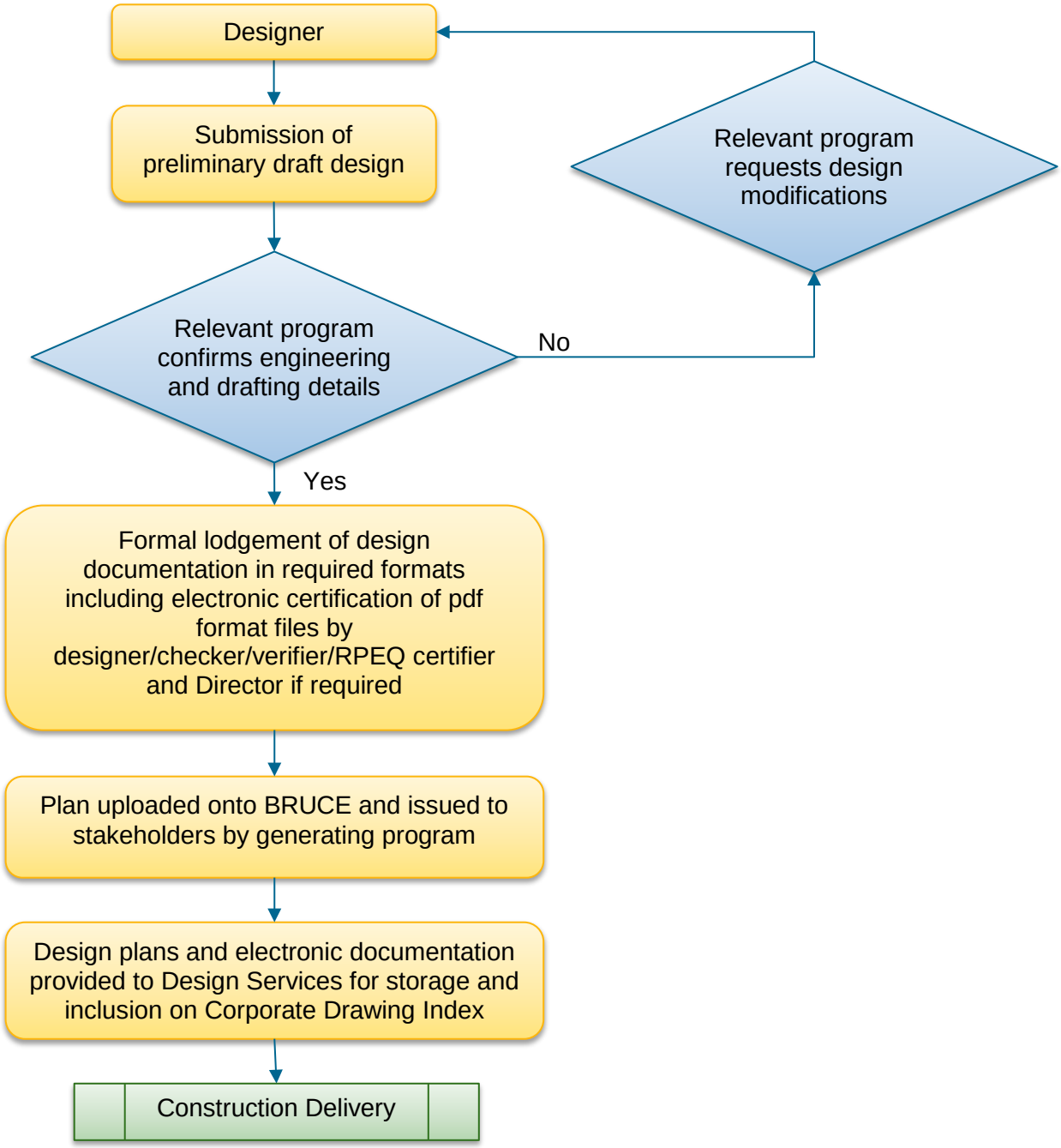
- Redundant existing features, e.g. edge of bitumen and shoulder to be removed
- Existing contours unless requested
- Overhead electricity lines unless they have an impact on the design
- 'Greyscale' presentation of detail. All line work (with the exception of underground and overhead services) must be in black.
- Shading – Shading can be problematic with plan reproductions and should be avoided. Use open hatching if necessary.

4.3.13 Set out points and set out files

- Set out point numbers are to be unique within the project (i.e. each set out point number only occurs once). Where set out point numbers are shown in plan view they are to include an open circle at the point. Plan views including set out point numbers tend to become cluttered. Therefore care must be taken to ensure each number is legible.
- ALL set out points within the set out file are to have a height (z value) specified. Where a height is not applicable and would normally be omitted, the set out point is to include a "-999" value as the height
- MRC's requirement for electronic set out data, where the design involves the modelling of 3D geometric design surfaces and where machine control is likely to be used, is described in mrc 3d model data export to construction.pdf.

4.4 Council Capital Works "For Construction" Plan Certification for Issue

Given the requirements for electronic transfer and lodgement of plans the following process flow has been developed to ensure appropriate certification and approval of construction plans is followed prior to issue for construction delivery.



5 "AS-CONSTRUCTED" DRAWINGS

5.1 General

"As-Constructed" drawings serve as a record of constructed assets and are used by Council for continued maintenance of its assets. The Council also provides this information to other parties where it is required to assist with identifying the location of infrastructure, connecting to existing infrastructure, avoiding damage to the infrastructure, altering the infrastructure, or other relevant reasons.

Generally, professionally produced AutoCAD (or equivalent) based design drawings produced in accordance with Council's guidelines will be suitable as the basis for preparation of "As-Constructed" drawings, depending on the variation between the original design and constructed works. Work originally included in the design drawings and omitted from construction shall be crossed out on the drawings.

Variations may occur between the constructed location of the works, and the design position, level and details, for valid reasons during the construction phase of any project. Where the variation between the constructed works and the design drawings exceeds the tolerances for position or level provided in this guideline, all drawings shall be amended to show the infrastructure in its "As-Constructed" location and form. All changes to design detail are to be presented on the drawings based on their "As-Constructed" condition.

Note: Release/Sealing of subdivision title plans will not occur until all required "As Constructed" information in the necessary format is submitted.

5.2 "As-Constructed" "Red-Pen" Mark-ups

A set of annotated plans – referred to as "As Constructed" "Red-Pen" Mark-ups – must be submitted at the completion of each project.

The Contractor/Construction Supervisor will compile one set of actual-size paper prints (i.e. A1 drawings printed on A1 paper, A3 drawings printed on A3 paper) of the design drawings for use on-site as "As-Constructed" "Red-Pen" Mark-up Drawings.

The set of prints shall be kept in a clean condition on-site and shall be marked-up ("red penned") as the works progress to show the final details of the "As Constructed" works.

"As-Constructed" details that are within design tolerances, shall be denoted as such by underlining applicable design details (e.g. dimensions and levels) in red ink or by making an appropriate comment of confirmation (e.g. extents).

"As-Constructed" details (e.g. dimensions, levels, extents) that are outside design tolerances, but have been accepted by a Site Instruction, and any modifications, additions or deletions to the original design shall be marked on the paper prints in red ink with appropriate explanatory comment. The dimensional measurements of the "As-Constructed" work shall be confirmed by survey (see 5.3 "As-Constructed" Survey Requirements).

5.3 "As-Constructed" Survey Requirements

In general, all "As-Constructed" works must be surveyed and certified by a Surveying Associate, Surveying Graduate or Surveyor registered with the Surveyors Board of Queensland . Refer to *MRC Guidelines for "As-Constructed" and ADAC Survey Pick-up* (available on MRC's website) for exceptions and further details and to Annexure C for an example of an acceptable Registered Surveying Person's Certification

5.4 Registered Engineer's Certification

All "As-Constructed" works must be certified by the RPEQ Engineer responsible for the supervision of the construction works. The certification must note that the constructed works comply with the design intent and function of the proposed works.

To this extent, the supervising RPEQ Engineer is responsible for the "As-Constructed" details and ensuring tolerances for construction are within specified limits.

It is recognised that in some circumstances, the tolerances for construction are exceeded. In these instances, the supervising RPEQ will be responsible for performing confirmation design calculations to ensure that the original design intent and function are not compromised. These confirming calculations shall be submitted with the "As-Constructed" drawings.

Should the "As-Constructed" details indicate a change to the design intent or function of the works, then revised design calculations shall be provided by the supervising RPEQ to indicate the acceptability of the proposed change relative to Council's requirements.

In situations where tolerances for construction are exceeded or there is change to the design intent or function, the supervising RPEQ shall complete and submit to the Council 'As constructed' drawings - non-compliance report and append any supporting information.

Council's approval of the change(s) is required prior to the formal acceptance of the Works.

The supervising RPEQ Engineer shall be responsible for the completion of 'As constructed' drawings - submission and compliance, which satisfies the requirements for Certification.

5.5 Drawing Format

In addition to the requirements outlined in 2 General Drawing Requirements, the "As-Constructed" electronic drawings shall be based on the survey data and field records of the "As-Constructed" works and shall not merely be annotated versions of the original design drawings.

The "As-Constructed" drawings shall be in AutoCAD DWG format (and including 3D format) and in digital pdf file format and shall be the same size as the Design Drawings and shall have title block and legend information as per the Design Drawings.

The "As-Constructed" plans may be checked by Council for accuracy and compliance with these Guidelines. Council reserves the right to refuse acceptance of the "As-Constructed" drawings if they do not comply with these Guidelines.

The standard and completeness of the "As-Constructed" drawings will need to be approved by Council prior to the endorsement of the plan of survey for the subdivision.

5.6 Drawing Content Requirements

The "As Constructed" plans will show all new, upgraded or removed assets and any decommissioned assets left in-situ and include the following details at the Chainages or Point Numbers as shown on the "For Construction" plans:

1. Road centreline
2. Change of grade of finished surface, earthworks batter interface points
3. Edge of bitumen
4. Lip, Invert and top of kerb and channel
5. Lip of kerb on median strips
6. Line marking including chevrons
7. Gully pits, headwalls, stormwater manholes/chambers, and field inlet pits
8. Subsoil drains and flush points
9. Invert levels of pipes and box culverts
10. Road shoulder
11. Top and invert of drains
12. New Signs placed
13. Concrete driveways, and invert crossings
14. Kerb ramps
15. Crash barriers
16. Fencing
17. Road and park furniture and concrete pathways
18. New sewer lines and manholes

19. New water lines, valves, hydrants, water meters, and water services
20. New Telecommunications services
21. New electrical services including street lighting
22. Corners of bridge deck and abutments
23. Retaining wall bases and any steps along the top and changes in direction
24. Trees
25. Spatial review of design detail and inclusion of any modifications associated with the constructed project
26. "As-Constructed" stamp digitally signed by a Registered Professional Engineer

5.7 Asset Register (Development Projects Only)

The asset register is an essential part of the Development engineering and architectural drawings. It should be accurate and included on the leading drawing, generally in accordance with the proforma set out in Annexure D. The applicant is required to identify and quantify the asset only, as the actual construction costs may not be known at the design stage. The register should include all structures and items associated with the subdivision or development that will be handed over to Council following Off Maintenance. These items are generally referred to as donated or contributed assets.

Asset Hierarchy.XLSX lists a comprehensive set of donated assets. Only a subset of the listed items will apply in most cases as the list also incorporates historical assets, such as arched brick drains, and heritage construction materials, such as porphyry stone. The applicant should not assume that a listed item will imply automatic acceptance of a material or product.

The final asset register should reflect the actual construction and should be submitted with the "As-Constructed" drawings. For each item, the applicant should specify the asset type, quantity, unit rate, and estimated value. Council will use the unit rates solely for asset valuation and capitalisation.

5.8 Asset Design As Constructed (ADAC) XML Submission

Further to the above mentioned "As-constructed" information, a valid 'Asset Design As Constructed' (ADAC) XML file shall be submitted as a part of the "As-constructed" bundle. The file shall be valid to Council's adopted ADAC Schema at the time that the works were initiated, unless otherwise stated in contract documents or development approvals:

Date Project Initiated	Project Type	ADAC version
1 July 2017 – 31 December 2019	• Council "Capital Works"	4.1
1 January 2020 –	• Council "Capital Works" • Development "Operational Works"	5.0.1

All development based operational works submissions lodged prior to 1 January 2020 are not required to conform to the ADAC requirements for "As-Constructed" submissions given they have been developed prior to these requirements being in place, but are required to supply required "As-Constructed" plans and assets registers as indicated in previous sections

All development-based projects lodged post 1 January 2020 will be expected to conform to the ADAC V5.0.1 XML file submission requirements. For further information regarding the creation of ADAC XML files, refer to the following documents on Council's website for the applicable ADAC version:

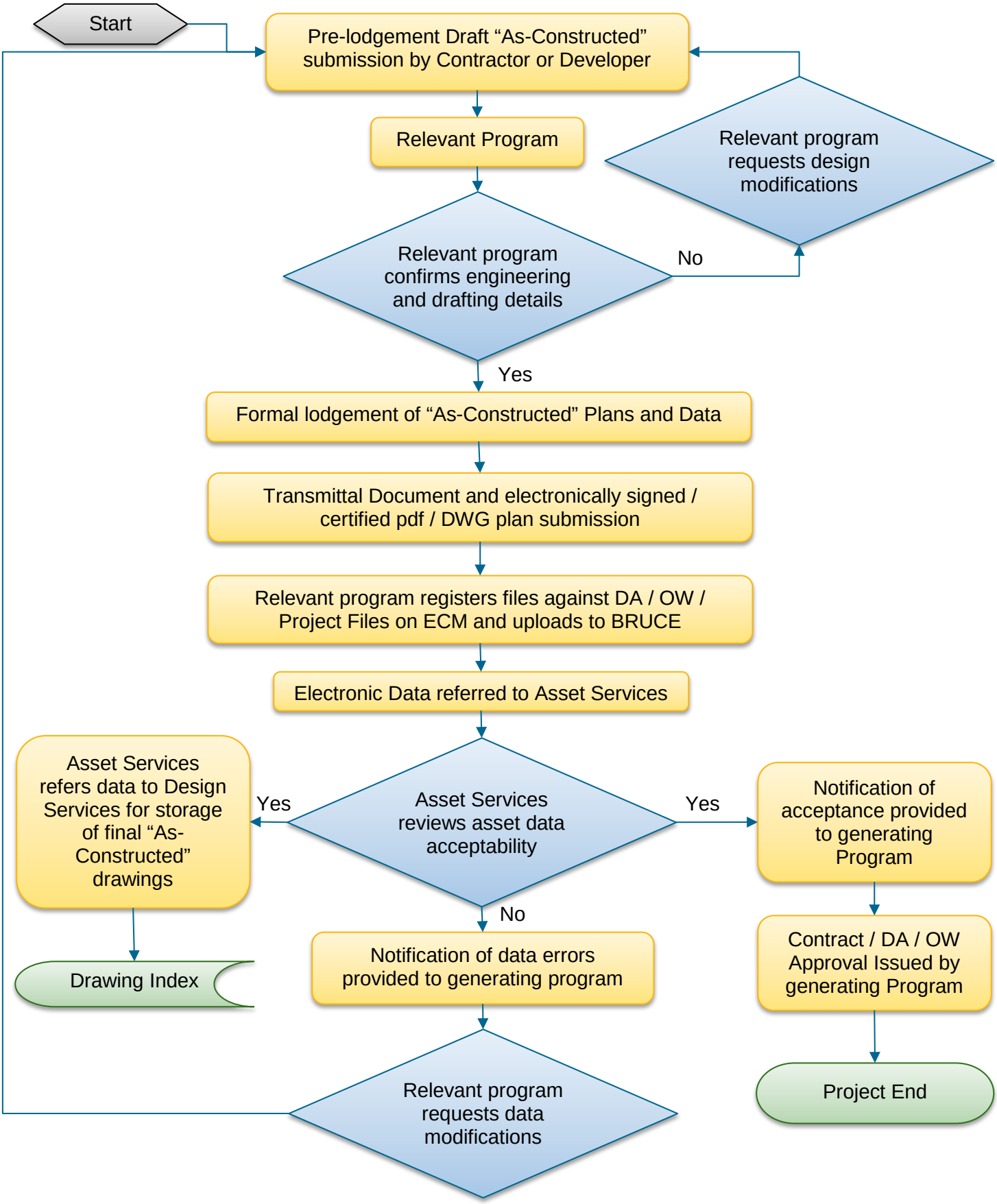
- MRC Guidelines for "As-Constructed" and ADAC Survey Pick-up
- MRC Guidelines for Creation and Submission of ADAC XML Files

- MRC Guidelines for Creation of ADAC XML Files using 12d Model

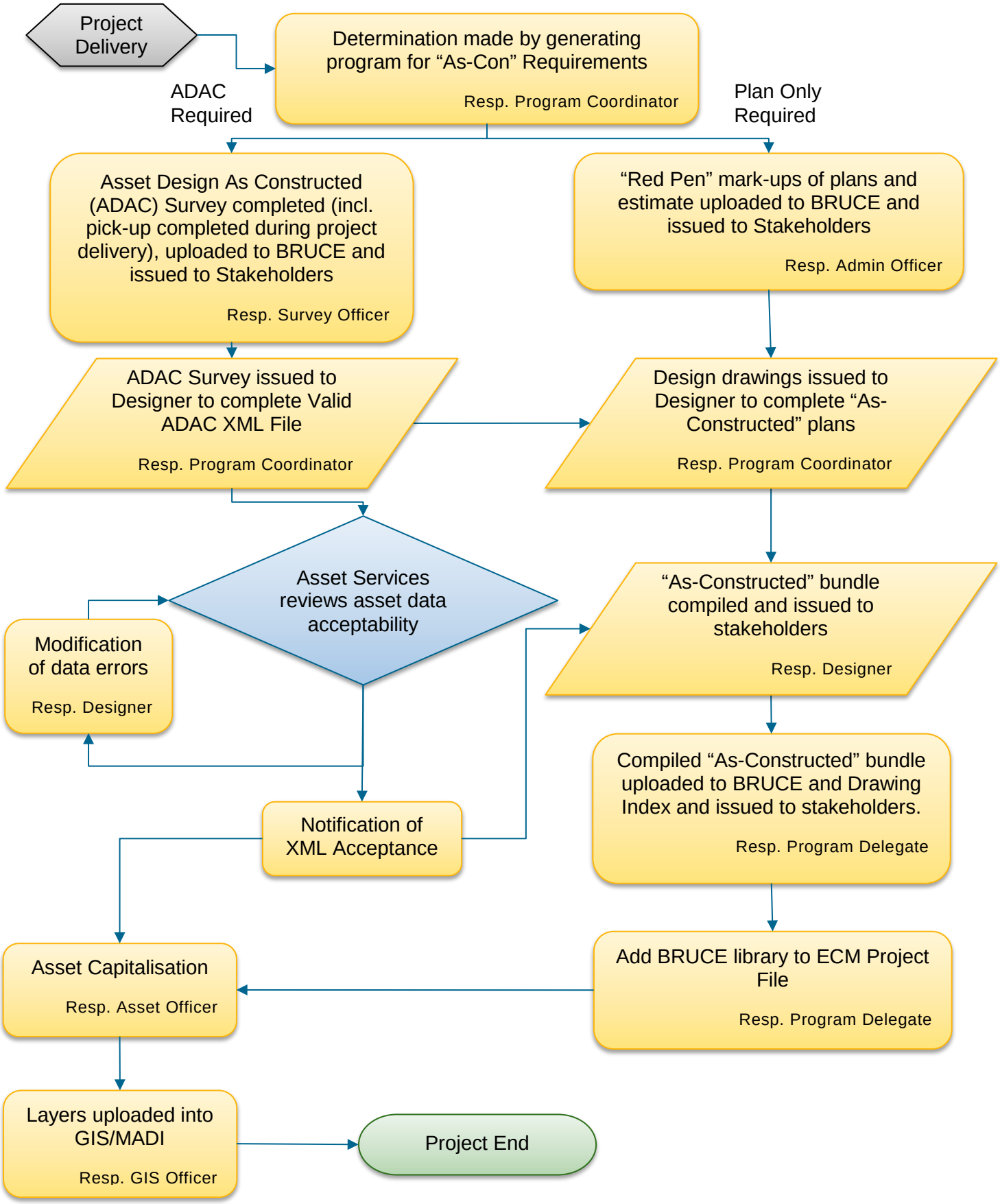
5.9 Submission of As Constructed Data Workflow

The “As-Constructed” bundle of information shall be submitted in accordance with the following process flows to ensure plan and asset data acceptability and registration into the appropriate internal systems.

5.9.1 As Constructed Plan and Asset Delivery Workflow for Contract and Donated Asset Delivery



5.9.2 As Constructed Plan and Asset Delivery Workflow for Internally Delivered Asset Delivery



DOCUMENTATION

6.1 Development Projects Design Report

The Designer shall submit a bound A4 Design Report with all plans lodged, excepting those plans for minor works. The Report shall include all the necessary design assumptions and calculations, correspondence and information to enable Council to expeditiously check the design submission or is required for historical records.

The Design Report shall be on company letterhead and shall contain the following minimum details:

a) The project details and the list of all plans (including sheet name and number) associated with the project.
b) A copy of the development approval conditions, if applicable, or design brief, where Council is the client, on which the design is based.
c) A copy of all separate approvals given by Council to variations from the minimum standard provided for in the relevant Guideline.
d) Records of pre-submission discussions with Council including confirming correspondence.
e) Copies of letters of approval from adjoining property owners for any works or discharge on their properties.
f) Evidence that arrangements have been entered into regarding provision and/or relocation of supply with Ergon Energy and Telstra (including approved reticulation/service plans, if available).
g) A photographic report confirming that the Designer has visited the site to ensure all site constraints have been considered and addressed
h) Pavement and wearing surface design assumptions and calculations.
i) Where available, records of geotechnical tests indicating design subgrade CBRs in cuts on which the pavement design has been based. Copies of the geotechnical reports are to be included in the design report.
j) Where additional subsoil drainage is required over and above Council's minimum requirement, the pavement design shall include design details for pavement drainage, prepared by a Geotechnical Engineer.
k) Stormwater drainage calculations in spreadsheet format (in accordance with QUDM requirements) together with details of pit types, capture charts used, bypass flows and flow widths at all pits.
l) Stormwater Drainage Catchment Plan detailing external catchments and internal sub catchments.
m) Design calculations for detention basins, dissipaters, scour protection and permanent water quality control structures.
n) Geotechnical reports, where relevant, relating to slope and batter stability, in-situ materials etc.
o) Structural and Geotechnical certification of design of miscellaneous structures including retaining walls, non-standard headwalls, drainage structures, reservoirs etc.
p) The street lighting design prepared by a suitably qualified and experienced professional engineer – including evidence that both horizontal and vertical lighting requirements are complied with. This shall also include any existing street lighting that requires removal during construction and measures to ensure that existing illumination levels are not reduced during construction.
q) For staged development, plans showing the overall design concept for water, sewer, stormwater, roadwork, cycleway and pathways, public open space, earthworks, erosion control and stormwater management plans shall be submitted with Stage 1 and an updated copy provided with subsequent stages.

r) Any water reticulation networks analysis that are included shall be supplied in a format compatible with Council's network system where requested.
s) Engineer's completed bill of quantities and estimate of cost.
t) All necessary details supporting any request by a developer for Council to financially contribute toward the development.
u) Any other specific relevant details sought by Council
v) Erosion Sediment Control and site based stormwater management plans in accordance with specification D7 as required.
w) Traffic Studies to a level of complexity required to justify road layouts, intersection treatments and use of traffic calming devices.
x) Completed Design Certification Report by RPEQ – refer to Annexure A

Further, the Design Report shall include an appropriate response to information required in specific sections of the Design Guidelines, as detailed in Annexure B.

The design Engineer shall ensure that every new 'section' of the Design Report commences on a separate page, all pages are numbered and the Table of Contents clearly identifies all aspects within the report.

All documentation (including calculations and sketches) shall be either typed or neatly written or drawn in ink. The use of pencil is not acceptable.

6.2 Capital Works Design Report

For Council capital works projects, the designer shall prepare a design report in accordance with the project's design brief and based on MRC *FRM-23.004* in the "MRC Consultants Pack." Access to the MRC Consultants Pack on MRC FileShare may be requested through the Manager of Council's Design Services Program.

6.3 "As-Constructed" Documentation

In addition to requirements specified in *MRC Guidelines for Creation and Submission of ADAC XML Files* (available on MRC's website), certain asset classes/types have specific requirements (listed below):

Release / Sealing of subdivisional title plans will not occur until all required 'As Constructed' information in the necessary format is submitted.

6.3.1 Civil Works

In addition to the electronic copies of PDF and DWG drawings as specified above, the submitter must also provide:

- Design Compliance/Certification documents,
- Construction Compliance/Certification documents,
- Test Results (Results of all tests conducted on the Works)
- Construction Checklists (All Construction Checklists completed on the Works depicting verified HP and WP releases by the Superintendent or their representative)
- Non-conformance Reports (All Non-conformance Reports generated including acceptable corrective actions as signed-off by the Superintendent)
- Daily Project Reports (All Daily Project Reports (including, but not limited to, manning levels, machines & plant onsite, weather records)

6.3.2 Buildings and Site Improvements

6.3.2.1 Architectural

Electronic copies of PDF and DWG drawings as specified above for the built structures including:

- structural drawings
- site layout
- soil reports
- footings
- energy efficiency
- building classification and compliance certificates
- structural calculations
- construction standards and specifications

6.3.2.2 Services

Electronic copies of PDF and DWG drawings as specified above for the built structure services that clearly identify the principal contractor; contract number, revision number of the document. This includes:

- electrical
- mechanical
- hydraulic
- plumbing
- gas
- drainage
- water reticulation and fire

6.3.2.3 Operation and Maintenance Manual

Including asset/equipment register for the installed assets, especially:

- the relevant warranty periods,
- models
- serial numbers

These manuals must be submitted electronically in both PDF and MS Word (editable) format.

6.3.2.4 Maintenance Plans and Consumables Lists

Lists detailing painting, finishes, floor covering schedules (e.g. product colour code/descriptions).

These lists must be submitted electronically in both PDF and MS Word (editable) format.

Note: The above information should cover details of all assets that were incorporated in the relevant building approval processes.

6.3.3 Reservoirs, Water and Sewage Treatment Plants, Water and Sewage Pump stations

For all water and sewerage treatment plants, pump stations and reservoirs the submitter must also provide:

6.3.3.1 Services

Electronic copies of PDF and DWG drawings of all civil, mechanical/electrical works.

The drawings must clearly identify:

- the principal contractor
- contract number
- revision number of the document

6.3.3.2 Operation and Maintenance Manuals

Where works comprise pump stations, reservoirs, treatment plants stormwater quality devices etc., three (3) bound copies of Operations and Maintenance Manuals for all components of the works shall be provided.

A copy of each manual must also be submitted electronically in both PDF and MS Word (editable) format.

Typical details of manuals for pump stations shall include:

- Contractor's name, address and telephone number
- Client's Contract number, job name
- Pump station general arrangement drawing showing pumps, motors, valves, pipe work, switchboard and electrical installation

Manuals for pumps shall contain the following information:

- Manufacturer
- Type and model number
- Serial number
- Dimensioned general arrangement drawing of pump and motor
- Sectional arrangement drawing with parts and list
- Dimensioned sectional arrangements detailing:
    - Maximum and minimum shaft / bearing clearance (radial)
    - Maximum and minimum impeller / bowl clearance (radial)
    - Maximum and minimum impeller / bowl clearance (axial)
    - Impeller / bowl wear rings
    - Motor / pump coupling - type, make and model number
    - Mechanical seals where applicable

Manuals for motors shall contain the following information:

- Manufacturer
- Type and model number
- Serial number
- Dimensioned general arrangement drawing
- Sectional arrangement for submersible motor power cabling, where applicable
- Gland sealing arrangement drawing for submersible motor power cabling, where applicable
- Cables, where applicable
- Terminal block arrangement drawing, where applicable

Manuals for valves shall contain a dimensioned sectional arrangement drawing with parts and material list for all valves

Manuals shall contain the following test curves:

- Pump witnessed test curves
- Motor test curves
- Motor torque / speed / efficiency characteristic curves

The operating and maintenance manual shall include:

- Safe working procedures: For switching and isolating the supply and distribution system
- Comprehensive description of operation, including flow charts detailing each operational activity (e.g. manual pump operation, routine test procedures)
- Maintenance procedures: Recommended maintenance periods and procedures
- Tools: Particulars of maintenance equipment and tools provided, with instructions for their use
- Equipment: A technical description of the equipment supplied, with diagrams and illustrations where appropriate
- Dismantling: Where necessary, procedures for dismantling and reassembling equipment
- Spare parts: A list of the spare parts provided
- Troubleshooting instructions shall be included for pumps, motors, valves and SCA.
- Step-by-step procedures for dismantling and reassembly of pumps, motors and valves using any special tools shall be detailed together with step-by-step procedures for replacement of wearing parts such as bearings, seals, wear rings, etc.

6.3.4 Artificial Wetlands

For all artificial wetland areas, the submitter must also provide:

- Electronic copies of PDF and DWG design drawings of the artificial wetlands.
- Maintenance plans and schedules for the artificial wetlands. These manuals must be submitted electronically in both PDF and MS Word (editable) format.

6.3.5 Stormwater quality improvement devices (SQID)

For all SQID (including treatment plants and gross pollutant traps) the submitter must also provide:

- Design specification details
- Manufacturer and supplier contact details
- Maintenance Manuals and procedures including:
    - Clean-out procedures that address (at a minimum):
        - public safety
        - maintenance techniques
        - equipment requirements
        - environmental management considerations
        - occupational health and safety and disposal requirements
    - Maintenance procedures and recommended frequencies for inspection, maintenance and cleaning functions in both wet and dry seasons.

ANNEXURE A DESIGN CERTIFICATION REPORT FOR DEVELOPMENT PROJECTS

MACKAY REGIONAL COUNCIL DESIGN CERTIFICATION REPORT

Project Title	
DA/BA Number:	
Consultant's Drawing Number:	
Name of Consultant:	
Name and Address of Developer	

I certify that the subject drawings represent a design:

☐ for which the attached design check lists provide a valid record;

OR

☐ which has been Audited through our approved QA system

I certify that this Design has been carried out in accordance with current standards of good industry practice and in accordance with MACKAY REGIONAL COUNCIL's Design Guidelines, Local Laws, Planning Policies, Planning Scheme and specific instructions received except for departures cited in the attached design checklists for Council's advice.

I certify that this Design will not significantly impact on the environment factors of the area as interpreted under the Sustainable Planning Act and Amendments and the Environmental Protection Act and Amendments.

I certify that this design meets requirements for obligations regarding safe design under the Workplace Health and Safety Act.

I certify that all structural elements of the Design have been designed by a competent qualified practicing Structural Engineer.

Design Engineer (Print):	
Qualifications	RPEQ Number
Signature	Date

DESIGN CHECKLIST 1 BASE PLOT OF EXISTING FEATURES

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Initial Plot verified by site inspection for existing drainage.			☐
2. Initial Plot verified by site inspection for existing property descriptions, boundaries and accesses.			☐
3. Initial Plot of contour verified as representative of site terrain.			☐
4. Trees and significant environmental features affected by development are clearly indicated and annotated.			☐
5. Features significant to cultural heritage considerations are clearly indicated and annotated.			☐
6. Existing public and private property likely to be affected by these Designs are clearly indicated and annotated.			☐
7. Survey and benchmarks clearly indicated and annotated.			☐
8. Existing and proposed utility services located and clearly indicated			☐

Departures from Council's standard requirements or special features to be noted

DESIGN CHECKLIST 2 HORIZONTAL ROAD ALIGNMENT

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Alignment compatible with design speed.			☐
1.1. Any curves below minimum radius for design speed?			
1.2. Superelevation rates when compared with horizontal curves in the design?			
1.3. Superelevation transitions sufficient?			
1.4. Tangent runout?			
1.5. Does curvature cause sight distance problems due to vegetation or other obstacles?			
2. Alignment is adequate in relation to clearance of roadside hazards.			☐
3. Driver and Pedestrian sight distance is adequate			☐
4. Conflict with existing services is minimised.			☐
5. Road widths and lanes meet Council's and design traffic requirements. 5.1. Is road widening required due to horizontal curve radii?			☐
6. Alignment of bridges suits road alignment.			☐
7. Pedestrian, bicycle and parking requirements are met.			☐
8. Provision for large vehicles such as buses, garbage trucks and emergency vehicles is adequate.			☐
9. Intersection layouts meet turning requirements of design traffic including emergency vehicles.			☐
10. Pavement width tapers and mergers are adequate.			☐
11. Pedestrians and prams are catered for.			☐
12. Conflict with existing Public Utility services has been identified and resolved			☐
13. Horizontal road alignment has been provided in accordance with any Conditions of Development Consent			☐
14. Horizontal road alignment set out data is clearly defined and tabulated			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 3 VERTICAL ROAD ALIGNMENT

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Grades meet maximum and minimum requirements.			☐
2. Vertical clearances to bridges and services meet standards.			☐
3. Vertical sight distance is adequate for drivers and pedestrians.			☐
3.1. Are SSD and SISD achieved?			
3.2. Any side roadways/ driveways affected by sight distance?			
3.3. Turning vehicles hidden by grades and vertical curves?			
4. Cover to drainage structures or services is adequate.			☐
5. Vertical alignment is adequate for disposal of surface drainage from properties and from road.			☐
6. Grades are satisfactory for 1:100 year flood levels.			☐
7. Vertical alignment is compatible with property access.			☐
8. The gradient on an intersecting road is not significantly greater than the cross slope of the through pavement and no greater than 3% at give way and stop signs.			☐
9. Sight distance is acceptable for all accesses to roundabouts.			☐
10. Alignment co-ordination with horizontal alignment is in accordance with the AUSTROADS design guides as referenced in the AUS-SPEC specifications.			☐
11. Conflict with existing Public Utility services has been identified and resolved.			☐
12. Vertical road alignment set out data is clearly identified on the longitudinal sections.			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 4 ROAD CROSS SECTIONS

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Typical Cross Sections have complete dimensions.			☐
2. Typical Cross Sections have kerb and channel, road safety barrier and surface drainage indicated.			☐
3. Batter slopes are indicated and batter treatment is indicated where appropriate			☐
4. Property boundaries, service locations and location of known existing underground services and pathway treatments are indicated.			☐
5. Sufficient Cross Sections are shown to define all variations and width transitions.			☐
6. Cross sections are of sufficient width to fully assess impact of road level on adjoining property.			☐
7. Stability of embankment slopes, batters and retaining walls has been verified as satisfactory.			☐
8. Cross section reference level conforms with vertical road alignments.			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 5 ROAD AND INTERALLOTMENT DRAINAGE

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Drawings indicate existing surface drainage.			☐
2. Hydrological data is the most current available.			☐
3. Hydrologic and Hydraulic design calculations are complete and fully recorded and available for audit.			☐
4. Underground drainage and structures do not conflict with services			☐
5. The designed drainage lines are compatible with existing incoming lines and outgoing lines.			☐
6. The length of line, type of pipe, size, class and bedding requirements are indicated for each drainage line as well on the schedule of drainage elements.			☐
7. Height of fill over drainage lines is within allowable limits.			☐
8. Drainage is provided for local depressions e.g. median areas or areas adjacent to fills.			☐
9. The effect of headwater and back-up water on private property has been assessed.			☐
10. Subsurface drainage has been provided when required and clearly located by line and level, with details provided.			☐
11. The need for batter drains has been considered for fills and cuttings.			☐
12. The height and energy level of downstream drainage has been considered.			☐
13. Drainage structures and flow paths are located to ensure safe vehicular and pedestrian transit.			☐
14. Drainage structure number, set out, type and pipe details indicated on the drainage plans and schedule of drainage elements.			☐
15. Emergency flow paths are located to minimise impact on private property.			☐
16. Road drainage has been provided in accordance with any Conditions of Development Consent			☐

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
17. Inter-allotment drains have been designed in accordance with Council's Specification and/or Australian Rainfall and Runoff (Edition 1987) or The Queensland Urban Drainage Manual.			☐
18. Appropriate land stabilisation and Velocity controls have been implemented to pipe systems, open channels and embankments.			☐
19. For allotments affected by flood controls, the floor height controls are to be compatible with road and drainage levels.			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 6 SIGNS AND MARKINGS

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Sign types, sizes, locations and support structure details are shown on the drawings in accordance with the QMUTCD.			☐
2. Pavement line marking and pavement marking type and set out is indicated on the drawings to meet the requirements of the QMUTCD.			☐
3. Signs and line marking have been designed in accordance with any Conditions of Development Consent.			☐
4. It is physically possible to place sign where indicated? Is there sufficient horizontal clearance?			☐
5. Any existing signage that needs to be replaced? Any conflicting existing signage?			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 7 PAVEMENT DESIGN

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. The pavement design and surface treatment is shown clearly on the drawings and any variations are indicated on appropriate cross sections.			☐
2. The pavement design complies with Council's Pavement Design Specification.			☐
3. Pavement Design is in accordance with any Conditions of Development Consent.			☐
4. Geotechnical data is assessed as adequate and is held on the design file.			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 8 BRIDGE/MAJOR CULVERT DESIGN

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. The design has been performed by a competent practicing Civil or Structural Engineer.			☐
2. Geotechnical Data is assessed as adequate and is held on the design file.			☐
3. The type and functional dimensions of the bridges meet AUSTROADS Bridge Design Codes, AS 3600, AS 1684, AS 1170, AS 4100.			☐
4. The type and class of all materials are indicated on the drawings.			☐
5. Records of all significant design calculations are available for audit			☐
6. The design complies with any Conditions of Development Consent			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 9 EROSION AND SEDIMENTATION CONTROL PLANS

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Both short term and long term erosion control plans have been prepared using the guidelines within Council's Design Specification D7			☐
2. Erosion and Sedimentation Control has been designed in accordance with any Conditions of Development Consent.			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

DESIGN CHECKLIST 10 CONSTRUCTION ISSUES

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
1. Is the project constructible using the Traffic Control Plan? Does the traffic control affect the design such as material requirements for roadways used for public use during the construction? Traffic restrictions?			☐
2. Is there enough work area and staging areas for the contractor to undertake construction operations? Does the construction traffic control allow for Contractor access?			☐
3. What is the design speed of construction traffic control?			☐
4. Is the work site safe for both traffic and workers?			☐
5. Is construction signage in accordance with Part 3 of QMUTCD?			☐
6. Do the sign messages convey the intended actions that are required to be taken?			☐
7. Do the signs have the proper legends, sizes, colour combinations and reflectivity?			☐
8. Are there existing signs within the construction zone that may conflict with the traffic Control Plan? Do any of the existing signs obscure the view of advance warning signs?			☐
9. If staged construction is used, is the signage from stage to stage consistent?			☐
10. Is a detour provided? Are all access points properly signed?			☐
11. Is it physically possible to place the signage where indicated? Is there sufficient horizontal clearance?			☐
12. Is there a need for any pedestrian or bicycle signage?			☐
13. Are channelisation devices required and are they appropriate for the operation?			☐
14. Are channelisation tapers located correctly? Are they the correct length? Are devices spaced correctly in the taper? Spaced correctly in the work area?			☐
15. Devices meet QMUTCD requirements for size, type, colour, reflectivity?			☐

Item	Check Completed by (Initials)	Date	Not Applicable (tick)
16. Are the devices properly ballasted?			☐
17. Do existing pavement markings conflict with the proposed temporary markings?			☐
18. Is marking consistent, especially during staged construction?			☐
19. Are warning lights used correctly? Adequate sight distance for arrow boards?			☐
20. Are construction areas properly shielded? Are temporary barriers required? Is it physically possible to place barriers as shown in the TCP?			☐
21. Contact numbers in case of emergencies available? If special construction events exist, are contact procedures in place to notify/ receive approval from authorities?			☐
22. Are work time restrictions in place?			☐
23. Is there a possibility of pedestrians and cyclists in the project area? Have they been considered?			☐
24. Does the traffic control or construction operations cause drainage problems?			☐
25. For projects with staged construction are there provisions to accomplish stage change overs?			☐

Departures from Council's or State Authority's standard requirements or special features to be noted

ANNEXURE B DESIGN REPORT SPECIFIC DETAILS FOR DEVELOPMENT PROJECTS

Specific details shall be submitted to Council in the Design Report as required in the following sections of various Design Guidelines:

Design Guideline	Section	Brief Description
D1 – Geometric Road Design	1.2	QT approval for bus routes and stops
	1.8	Intersection spacing – functional performance maintained
	1.9	Design Speed
	1.22	Street lighting design – both horizontal and vertical
D2 – Pavement Design	1.5.1	Design Traffic
	1.5.2	Sub-grade evaluation
	1.5.3	Environment
	1.5.4	Pavement and Surface materials
	1.5.5	Construction and Maintenance Considerations
	1.6	Pavement Thickness design
	1.7	Surface design
D3 – Structures – Bridge design	1.5	Backwater effect
	1.5	TMR pre-registration evidence
	1.5	Public Utility discussions
D4 – Subsurface Drainage design	1.5	Geotechnical Report – if subsoil drains to be eliminated
D5 - Stormwater Drainage Design	1.5.1	Design Rainfall Data – Hydrology
	1.5.2	Catchment Area
	1.5.3	Rational Method calculations
	1.5.4	Rational Method – computer analysis
	1.6.1	Hydraulic Grade Line
	1.9.1	Details required when design outlet is below HAT
	1.9.5	Proposed easement details
	1.9.5	Deed of Agreement – to construct works on adjacent property
	1.9.5	Agreement – to increase flood level on upstream properties
	1.10.2	Hydrological Summary Sheet
	1.11.1	Overland Flow – weir calculations

ANNEXURE C EXAMPLE OF REGISTERED SURVEYING PERSON'S CERTIFICATION OF "AS-CONSTRUCTED" WORKS

EXAMPLE OF REGISTERED SURVEYING PERSON'S CERTIFICATION OF "AS-CONSTRUCTED" WORKS

We hereby certify that the locations, surface and invert levels of all works and infrastructure presented on the drawings noted below and in the digital data have been surveyed and meet the accuracy standards as defined by Mackay Regional Council.

SBQ Registrant _____

Surveying Associate/Surveying Graduate/Surveyor

SBQ Number _____

Director: _____

Date: _____

Drawings and Documents pertaining to the above:

ANNEXURE D ASSET REGISTER FOR DEVELOPMENT PROJECTS

MACKAY REGIONAL COUNCIL ASSET REGISTER

Project: _____ Stage No: _____

Supervising Engineer: _____

Project Principal _____

Date _____

Asset	Unit	Quantity	Rates	Totals
Kerb and Channel	m	length		
Median Kerb	m	length		
Two coat seal	m^2	area		
AC Seal	m^2	area		
Subgrade Replacement Road Name	m^2/m	area/depth		
Base Course Road Name	m^2/m	area/depth		
Top Course Road Name	m^2/m	area/depth		
Conc. Footpath	m	length		
Stormwater Drainage Pipes	diameter	length		
Entry Pits	Type Road Gully Manholes Property Pits	number		
Concrete Drains	width (m)	length (m)		
Sewerage Reticulation Pipes	diameter/depth	length		
Manholes	diameter	number		
Pump Stations	type/size	number		
Rising Sewer Mains	diameter	length		
Water Reticulation Pipes	diameter	length		
Hydrants		number		
Valves	type/size	number		
Pump Stations	type/size	number		
Reservoirs	volume	number		
Misc-Roads		item		
Misc-Stormwater		item		
Misc-Sewer		item		
Misc-Water		item		
Turf/Grass (Area within Road Reserve)	area(m^2)	number		
Garden (Area within road reserve)	area(m^2)	number		
Turf/Grass (Area within Park/Council reserve)	area(m^2)	number		
Garden (Area within Park/Council reserve)	area(m^2)	number		
Tree (Size within road reserve)	size(L)	number		
Tree (Size within Park/Council reserve)	size(L)	number		