

# Minimum Design Standard – Architectural Design

## 1 General

The purpose of this Minimum Design Standard (MDS) is to set out Northern Territory Government (NTG) minimum requirements for the design of non-residential building projects<sup>1</sup>. It is the responsibility of the designer to adhere to the requirements of this MDS.

Any design aspects not specifically addressed by this MDS must be identified by the designer and brought to the attention of the Department's (Department of Infrastructure, Planning and Logistics (DIPL)) Contract Manager for resolution during the design process.

All statements made in this document shall be understood to be a minimum requirement, unless specifically noted as otherwise. Guidelines for best-practice may be provided over and above the minimum requirements for some design elements and these are clearly described as such, as well as specifying what is required from the design development process with respect to addressing those guidelines.

### 1.1 Legislation, Regulations, Codes & Guidelines

Depending on the project, certain requirements may apply and so professional advice is necessary to ensure compliance. It is the responsibility of the designer to ensure that the design and documentation is legislatively compliant and follows best practice. Certain legislation, regulations, codes and guidelines includes but is not limited to the following:

- National Construction Code (NCC)
- Australian Standards (AS)
- *Disability Discrimination Act 1992 (Cwlth) (DDA)*
- *Work Health and Safety (National Uniform Legislation) Act 2011 (WHS)*
- Specific Agency requirements and DIPL Minimum Design Standards

### 1.2 Seismic Restraint

The NCC defines the significance of a building by its importance level (IL), and the requirements for seismic constraints increases with each level of importance. Where required, seismic restraint shall be designed to AS 1170.4 and in accordance with the NCC.

Any non structural building parts and components that require seismic restraints must be coordinated with the structural engineer. This may include:

- Walls, ceilings, infill panels
- Doors, windows
- Partitions, screens, enclosures
- Parapets, gables
- Mechanical and electrical components (as part of mechanical and electrical documentation)

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<sup>1</sup> The functional requirements of residential buildings significantly differ to those of non-residential buildings.

## 1.3 Technical Specification

DIPL's master technical specifications are available via the DIPL Contract Manager for the contract.

- Any items that do not form part of the works must be deleted.
- Do not leave any fields blank.
- Do not reformat document

## 1.4 Co-ordination of designs across disciplines

The lead designer is responsible for the co-ordination of the design and documentation across all disciplines required to complete the design works. Review the designs and ensure the designs are co-ordinated and clashes, or potential clashes, in the designs of the works are eliminated.

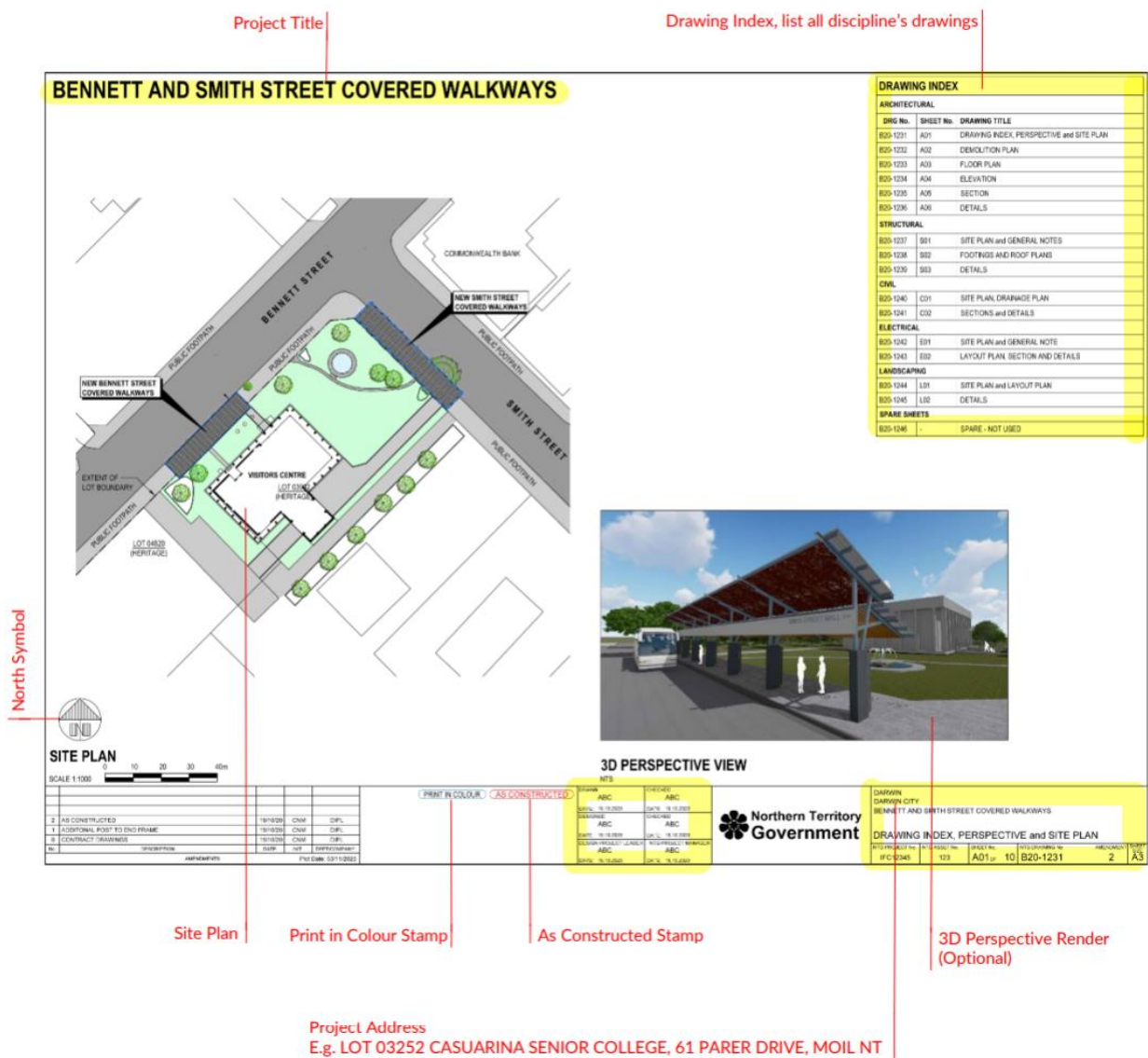
## 2 Design Submissions

The deliverables must be conclusive, quantitative and prescriptive. The construction Tender documents shall include comprehensive drawings, technical specification and schedules required to fully describe the works.

Prior to commencement of any documentation, a sample drawing sheet (from all disciplines) must be provided to the Principal’s Representative for approval. As a minimum, include the following highlighted items to confirm the correct project information has been applied to the title block and that text heights and fonts are acceptable.

Refer to NTG Technical Drawings [Part 3 – Documentation Manual for Buildings](#).

FIGURE 1: Example Cover Sheet



## 2.1 Stages of Design Documentation

In most cases, the project brief will include a concept design. The concept design may be in the form of high level sketches, images or statements that establish the underlying idea behind a design.

The following design stages develops this concept design and may span over several phases of the project. As a guideline, the information required at each design stage shall include, but not limited to:

### 2.1.1 Schematic Design Stage (development of the Concept Design)

- a. Proposed site utilization study with building/structure located
- b. Preliminary sun studies
- c. Schematic floor plans and simplified elevations indicating the fundamentals of the architectural concept.
- d. Preliminary building sections and elevations
- e. Descriptions of proposed construction methods, proposed materials and proposed work to be included in the construction contracts.
- f. Sketches, mood boards and 3d representations are accepted at this stage to help convey the design intent

### 2.1.2 Design Development Stage

Design Development documents shall include drawings and a written report in more detail than the Schematic Design documents and shall take into account any review comments from the previous submittal.

- a. Show all major site development such as orientation, access road paving, walls, and outside support buildings, structured parking facilities, programmed play areas, and paved parking lots, along with preliminary stormwater management and erosion control features
- b. All north points pointing to the top of the page
- c. Demolition Plans clearly defining items to be demolished, removed or salvaged
- d. Floor plans with final room locations including all openings
- e. External elevations
- f. Roof plan(s) indicating pitch, drainage areas and drain locations
- g. Reflective ceiling plans including material, ceiling grids and heights (mechanical and electrical fixtures shall be included in the mechanical and electrical drawings).
- h. Wall sections showing final dimensional relationships, materials and component relationships
- i. Identification of all fixed and loose equipment, furniture, and furnishings
- j. Room inventory data sheets showing locations of furniture and equipment for each room

- k. Finishes and materials schedule
- l. Preliminary door and window, and hardware schedule
- m. Preliminary development of details, including joinery, construction and connection, and vapour barrier details
- n. Legend showing all symbols used on drawings
- o. Outline specifications of materials to be specified in the Construction Contract Phase.
- p. Drawings shall include information on major finishes
- q. Indicative furniture layout plan – this shall be the only drawing where loose furniture is shown
- r. The designer shall submit the final design development package, meeting minutes, etc. to show how review comments made in schematic design have been addressed. It should be clear from the notes where the specific item was incorporated into the Design Development submittal or an explanation if it was not incorporated.

### 2.1.3 Construction Contract Stage

- a. Site set out points
- b. Critical sections and details identified and drawn
- c. Roof plan with all penetrations and roof details
- d. Project specific vapour barrier details shall be drawn.
- e. Kitchen layout and equipment schedule
- f. Enlarged toilet room layout and elevations with all fixtures and dimensions
- g. Provide dimensions where required to satisfy AS1428 and NCC (eg. balustrades, sanitary fixtures, statutory signage, decals etc)
- h. Show all power and data outlets in elevation, with dimensions
- i. Reflected ceiling plan with all ceiling materials and heights identified
- j. Bulkhead and lintel details
- k. Finish plan and schedule
- l. Door and hardware schedule, elevations, and head and jamb details. Specify door closers/hold open devices, door stops, drop bolts etc where required.
- m. Masonry details
- n. Stair and ramp details
- o. Elevator sections and details if applicable
- p. Key plans with final room numbers as approved by end user

- q. Specifications of materials to be specified
- r. Cross referencing is complete and correct. Where reference is made to another discipline's drawings (eg. 'Refer structural engineer's details'), ensure that discipline has provided that information.
- s. All naming convention of buildings, structures and rooms are correct and consistent across all disciplines.
- t. Title block information is correct and consistent across all disciplines.
- u. Ensure all disciplines have used the current architectural base plans and that layers that do not form part of the works have been turned off, for clarity
- v. Include FECA and UCA for total floor areas of each building
- w. The designer shall submit the final construction document package, meeting minutes, etc. to show how review comments made in design development have been addressed. It should be clear from the notes where the specific item was incorporated into the construction document submittal or an explanation if it was not incorporated.

## 3 Design Requirements

### 3.1 Objective

Consider the following design objectives where applicable to the project. Their interrelationships must be understood, evaluated, and appropriately applied to the project to achieve a high-performance design solution:

- **Aesthetics** – physical appearance and consideration of the surrounding environment including neighbouring buildings and structures
- **Physical Environment, Health & Wellbeing** - effective design that positively enhances the health and wellbeing of staff such as: natural light and air, colours and materials, spaces and acoustics
- **Functional / operational** – spatial requirements, system performance and durability of building elements
- **Accessibility** – the design is usable and marketable by all people with various abilities
- **Cost effective** – budget control and whole of life building costs
- **Security and safety** – consider the three levels of security access: public areas, invited areas and private areas
- **Historic and cultural preservation** – such as: heritage and aboriginal protected areas
- **Sustainable** - design for ecological sustainability (energy, material, water), and organisational sustainability (cost effectiveness, culture and values)

## 3.2 Site

- a. Where possible, minimise impacts to the **local natural habitat**
- b. Where appropriate, the design shall follow the **existing slope and contours** of the site to minimise land excavation and filling
- c. Consider **building orientation**, sunlight and natural breezes (cross ventilation)

## 3.3 Building Structure & Fabric

- a. In the first instance, existing components/structures shall be considered for reuse unless it has reached the end of its economic life or no longer achieves the end user's requirements.
- b. Materials shall reflect low maintenance considerations. All materials and components must be robust and vandal proof, and shall not be labour intensive at the repair stage.
- c. Where possible, use locally sourced materials. Consider readily available materials and minimum lead times
- d. Consider location of works and material transportation methods (including disposal)
- e. Avoid **roosting and nesting** opportunities in the building fabric and form. Deep window sills, exposed 'Z' and 'C' purlins, etc
- f. Consider **reflections, shadows and patterns** cast onto working areas and display surfaces by ceiling and other overhead fixtures and fittings. These shadows are to be avoided completely.
- g. Ensure sufficient access behind **sunshade screen panels** for maintenance
- h. Walls and floors generally - **Control joints, expansion joints, saw cut joints** and the like shall be determined and documented as part of structural works

## 3.4 Roofing

- a. Metal cladding sheeting thickness to be 0.48BMT
- b. **Roof Pitch** shall be no less than 5 degrees
- c. Consider appropriate **roof sheeting profile** to suit roof pitch and ensure good drainage

## 3.5 Stormwater

- a. Consider **stormwater management**. Indicate falls to slabs and ground to allow water to drain away from buildings and prevent pooling.
- b. **Gutters:**
  - o Consider gutters for **large roof surfaces**. Minimise erosion to ground and built surfaces caused by roof runoff water
- c. **Downpipes:**
  - o Consider use of 150 diameter **downpipes** for large roofs (or where required) to minimise blockage from balls/foilage etc.

- **Downpipe Pit details** must be coordinated with structural and civil. Design so that spout ends align perpendicular to the surface of the grate.

d. **Stormwater pits:**

- Downpipe water run off across paved areas to drains will not be accepted as it causes **moisture/slippery surfaces/stains on paving**. In this situation, downpipes must discharge into an underground stormwater disposal system.
- Discharge downpipes to a grated pit
- Finish downpipes 100mm above grated pit
- Minimum grate sizes:
  - 100 diameter downpipe – 300 grate
  - 150 diameter downpipe – 450 grate
- Grates should be fixed to prevent unauthorised removal. However a system is required to allow for cleaning where necessary.
- Ensure the size and design of the grate and pit is sufficient to take water runoff from the building / structure during heavy rainfall and high winds (i.e. heel guard grates not accepted in this situation).
- Downpipe sumps must be secured in a concrete perimeter to prevent future movement/damage.
- Consider injury due to exposed sharp edges and tripping hazards due to unsightly and poorly designed extended spout ends.

e. **Grated pits and drains:**

- Must be similar or equal to that supplied by Patent Products (Aust) Pty Ltd, and be non-slip.
- Consider **heel guards** in trafficable areas (heel guards not accepted in downpipe pits). Letterbox pits must address opening.
- All **lids** MUST be fitted into a galvanized angle frame and hinged to the frame. Pits must also be at levels to allow surrounding surfaces to drain into them.

## 3.6 Insulation

- a. Consider use of insulation spacers such as Fletcher Razor or CSR Ashgrid to accommodate thickness of insulation where required.
- b. Use only Bio-soluble products rated FBS-1

## 3.7 Vapour Barrier

- a. Standard details are not accepted. All vapour barrier **details** must be designed and drawn, specific to this project. Details shall not be left to DIPL and the contractor to resolve during construction.



- b. Refer to the current DIPL documents:
  - [Vapour Barriers Typical Details](#)
  - [Vapour Barriers Specification](#)
- c. **Extent** of vapour barrier must be clearly shown on drawings
- d. Vapour barriers are generally not required to **open structures or non air-conditioned spaces**, however consider use of insulation where heat gain or noise may be an issue

### 3.8 Ceiling & Linings

- a. **Ceiling Grid** – Exposed ceiling grid system – steel components. The entire system must consist of compatible components from same manufacturer.
  - Generally 600x 600mm grid with main tees suspended at 600 centres.
- b. **Exposed grid members & trims** to be powder coated finish; concealed members to be galvanised.
- c. Proprietary item: Rondo DUO Exposed Grid Ceiling System or equal approved by DIPL superintendent, to be installed in accordance with manufacturers written instructions.
- d. **Acoustic Tiles** – Consider humidity conditions, tile density & rain noise in the selection of tiles. Plaster Acoustic Tiles suitable for exposed grid system is preferred.
  - **NRC rating** minimum.0.7. Mass nom. 12kg/sqm and above, to suit grid. Acoustic Ceiling Tile –nom. 600x600 with rebated/recessed edges & factory pre-finished tile.
- e. **Ceiling access** – All enclosed roof spaces must be accessible through manholes provided. Consider security of the spaces within the building concerned. Locate services during design to minimise numbers of ceiling access points.
- f. Consider **maximum heights** for ceiling, windows, lights, fans and other fixtures can be easily accessed for service and maintenance
- g. **Flush ceilings** are to be minimum 13mm plasterboard paint finish unless required to be fire rated or acoustic treated. Use WR plasterboard in wet areas

### 3.9 Walls

- a. Consider impact resistant/robust surfaces in high use areas. Minimum 13mm thick '**FIBEROCK**' flush jointed.
- b. For **non-load bearing internal walls up to 3 metres high**:
  - 1.2BMT stud with 1-row nogging in high impact areas.
  - Minimum 0.8BMT stud with 1-row nogging accepted in low impact areas.
- c. Internal block walls of Kitchen/Food prep areas to be rendered, paint finish to avoid exposed mortar joints (dust collection, insects, fat etc.)
- d. **AUTEX** – Clearly note in the documents that the installer must have completed an Autex installation training course and be certified as an Autex approved preferred supplier. Use

proprietary trims with no sharp edges.

Avoid trims on corners as they become a safety hazard

- e. Narrow infill strips will not be accepted – design panel layout to suit commercially available sizes.
- f. Metal cladding sheeting thickness to be 0.48BMT

### 3.10 Floor Linings

- a. Narrow strips and small sections of flooring materials of any kind will NOT be accepted. Where concerns exist, provide a **layout/cutting diagram** to the Contract Supervisor prior to work commencing for approval.
- b. Sheet vinyl is preferred for high traffic areas and GLA's. Consider the use of a moisture barrier paint system, compatible with the selected vinyl.

### 3.11 Doors

- a. All doors to be 38mm **Solid core doors** with 20mm edge strip to base & 12mm edge strips all other edges. Minimum door leaf width to be 920mm, fitted to frame with 4 nos. hinges.
- b. All external doors to habitable rooms (except Plant /service rooms) to be provided with threshold ramps
- c. Match to existing **master key system** where required.
- d. Provide a comprehensive **keying schedule, lock and latch schedule** along with brand names to new Schools.
- e. Coordinate **electronic accessed doors** with electrical services drawings.
- f. Correctly indicate hinge and handle side in elevation as per AS1100. Diagonal lines that indicate the **door swing** in elevation shall converge at handle side.
- g. Provide a graphic representation of all doors and gates in the **door schedule**.
- h. Doors to be **self-closing** in air-conditioned spaces
- i. Consider **concealed door closers**
- j. Doors that open into corridors or small spaces to have **viewing panels** or be glazed
- k. Install weather seals to all external doors
- l. Ensure all external openings are protected from weather damage (exposure to high winds, rain, surface water drainage etc)

### 3.12 Windows & Subsills

- a. Minimise **direct sunlight** into rooms for long periods of time. Consider sun shading and/or screening that still allow easy access to window panes for cleaning and maintenance.
- b. Provide shading to all windows, including high level and clerestory windows

- c. Indicate **reveals** to be painted prior to installation of sub-sills. All windows to be retrofitted within full sub-sill, seal behind.
- d. Provide **details** for endorsement by DIPL – consider impact of internal linings/renders and seals during design.
- e. Correctly indicate hinge and handle side in elevation as per AS1100. Diagonal lines that indicate the swing of an awning window in elevation shall converge at handle side.
- f. Provide a graphic representation of all windows and glazing in the **window schedule**.
- g. Consider sufficient egress options available if installing **fixed screening** to windows

### 3.13 Internal Fitout

- a. Consider the **height relationship** of window and door heads to each other. Slight deviations are aesthetically unacceptable.
- b. **Co-ordinate** all joinery and furniture with electrical switches, power points, fans, lights, window controllers, blinds and the like. Overlapping of furniture with these items [and any other fixture] is unacceptable. This co-ordination is the responsibility of the lead designer.
- c. Do not show **loose furniture** on the drawings (for clarity) other than on a separate furniture layout plan
- d. Show all **electrical fixtures** on elevations including all mounting height dimensions
- e. Consider **maximum reach heights** of joinery and display surfaces (eg. Pinboards, ceiling mounted displays), etc. Designs should not encourage the end user to climb unless specifically required and safety systems are in place

### 3.14 Joinery

- a. Minimum 18mm sheet thickness for all carcasses, doors and shelving
- b. Kickboards and plinths to be constructed from A-BOND Plywood
- c. 18mm MDF MR 300-600mm deep: Max width (span) 600mm or 750mm with 42x19 hardwood stiffener front and rear
- d. 25mm MDF MR 300-600mm deep: Max width (span) 750mm or 900mm with 42x19 hardwood stiffener front and rear
- e. 32mm MDF MR 300-600mm deep: Max width (span) 900mm (as library shelving MAX 750mm span)

### 3.15 Safety & Accessibility

- a. **PVC Tactile indicator strips** are not acceptable. Other approved tactile systems are to be considered.
- b. The design should discourage activities such as loitering, and minimise opportunities for intruders to hide or climb/access prohibited areas.

## 3.16 Landscaping

- a. **Rubberised Softfall** – TVP Softfall is preferred. Use only accredited installers. Provide edging details.
- b. **Sand Softfall** – Mary River Sand or other suitable washed sand only. Provide edging details.
- c. **Pool type fencing** - Specify fence height - 1200mm & 1500mm (perimeter) to be confirmed at design stage.
  - o **Construction:** 19mm diameter tubular steel fence uprights welded to underside of top bar and on top of bottom bar. Where horizontal midrails are required, the upright members shall be punched through and welded to form a rigid panel. Discuss need for pool latch installation or higher level of locking.
  - o **Footings:** to be designed to suit height/spacing of support posts. Gates also to be fabricated to above specification. Provide all proprietary accessories to complete the installation. Provide a 100mm concrete mowing strip below the entire fence perimeter.
  - o **Finish:** Hot dip galvanised steel and powder coated.
- d. Consider the specification of outdoor furniture products from local supplier HPA (Helping People Achieve): <https://helpingpeopleachieve.com.au/>