URBAN CITY CONSULTING

BCA COMPLIANCE REPORT

521 The Northern Road Londonderry

Prepared by: Urban City Consulting

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Status: Final Report

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1.0 INTRODUCTION

1.1 Location and Description of the Proposal

The site is located in The Penrith City Council LGA at 521 The Northern Road, Londonderry. Access is provided from the eastern side the road. The existing dwelling aligns with and fronts The Northern Road resulting in a north/east to south/west orientation. The new buildings will be constructed at the rear of the existing dwelling with an east/west alignment. The neighbouring property to the south/west is used for an automotive wrecking business and the Castlereagh State forest is located on the other side of the road. The remaining development predominantly consists of rural/residential and rural industry uses.

Currently, the existing buildings on this site are a single storey brick veneer dwelling and outbuildings including sheds and awnings. It is proposed to construct the following additional buildings:

a. Four mushroom growing rooms;
b. A packing and loading area;
c. Car parking spaces located between the dwelling and new growing rooms;
d. A spent compost drying store at the rear of the growing rooms; and
e. A sewer treatment facility, wash down and water treatment ponds and a dam on the south/western side of the growing rooms.

The existing dwelling will be retained. The new growing rooms and packing and loading area will be located under the one roof.

The site is flat with a minimal fall to the rear and south/west.

The following photograph shows the existing entry on the southern side of the site.

Photo 1: Entry to the Site

The following photograph shows the existing single storey brick veneer dwelling that will be retained as part of the development proposal:

Photo 2: Existing Dwelling

The following photographs are of the existing rear yard of the property and show the typical fencing, pasture ground cover and scattered tree cover on the subject property. The forest community on the adjoining properties is seen in the background.

Photo 3:

Photograph 4:

Photograph 5:

Photo 6:

Photo 7:

Photo 8:

1.2 Report Purpose

This report has been prepared to identify the provisions that the proposed building works must satisfy to comply with the requirements of Parts B, C, D, E and F of the Building Code of Australia (BCA). If any non–compliances in the detailed documentation are discovered, the report will recommend the action required to achieve compliance. Commentary on the application of Parts G to J of the code to this proposal is also provided.

The report will also detail those features of the proposal that do not comply with the Deemed-to-Satisfy provisions (DTS) but could still satisfy the performance requirements of the Code using an alternative solution.

1.3 Basis of Report

This report has used the following documentation to formulate upgrading recommendations:

- Information provided by the client (Notification Plan Job No. 140655 Issue A 15/7/2015, Site Layout Plan No.07166C101 Rev. A 2/6/15 and Overall Site Plan 07166C201 Rev A 10/02/16) and gathered at a site inspection;
- The provisions of the BCA incorporating applicable NSW Appendices;
- Guide to the Building Code of Australia;

- Environmental Planning & Assessment Act 1979; and
- Environmental Planning & Assessment Regulation 2000.

`1.4 Limitations and Exclusions

The limitations and exclusions of this report are:

- The assessment for consistency with the requirements of the BCA has been confined to the level of detail available when the report was prepared;
- Details in regard to access for people with disabilities have been assessed to the extent of the DTS provisions of the BCA only;
- This Report does not address issues in relation to the following:

  a) The structural adequacy of the building including the Fire Resistance Levels (FRLs) of any building elements (unless specifically referred to);
  b) The design, maintenance or operation of electrical, mechanical, hydraulic or fire protection services;
  c) Local Government Act and Regulations;
  d) Occupational Health and Safety Act and Regulations;
  e) WorkCover Authority requirements;
  f) Requirements of other Regulatory Authorities including, but not limited to, Telstra, Sydney Water, Electricity Supply Authority, RMS, Council and the like;
  g) Disability Discrimination Act; and
  h) Construction Safety Act;

- This assessment does not include the detailed requirements of the Australian Standards; and
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2.0 BUILDING DESCRIPTION

2.1. BCA Assessment Parameters

The following information has been used to determine the extent of compliance with the requirements of the BCA and any work required to satisfy those requirements.

2.2. Rise in Storeys (RIS) (Clause C1.2)

The buildings have a rise in storeys of one (1). The number of storeys contained is one (1).

2.3. Building Classifications (Clause A3.2)

The proposed building contains areas for growing, packing and loading of mushrooms and is therefore a Class 8 building.

2.4. Height of Storey (Clause A1.1)

The proposed sheds will have a wall height of 4.6m and the ridge height will be 10m from the ground.

2.5. Type of Construction (Table C1.1)

The table requires Type C Construction for a Class 8 building with a rise in storeys of 1.

2.6. Floor Area and Volume Limitations (Table C2.2)

The building is subject to the following maximum floor area and volume limits for Type C construction:

▪	Proposed Class 8	Maximum Floor Area	2,000m^2
		Maximum Volume	12,000 m^3

C2.3 of the BCA contains provisions for large isolated buildings that exceed the floor area and volume restrictions. Where the building is a Class 5, 6, 7, 8 or 9 and the fire compartment does not exceed 18 000 m^2 in floor area or 108 000 m^3 in volume, it must be:

(i). Provided with an 18m wide open space around the building. The open space must be within the allotment, include vehicular access and not obstructed or have buildings other than guardhouses or similar structures built upon it; and
(ii). Provided with a 6m roadway within the allotment that is no more than 18m from the building, capable of providing forward travel of emergency vehicles and provides reasonable pedestrian access to the building; or

Where the building is a Class 5, 6, 7, 8 or 9 and the fire compartment exceeds 18 000 m^2 in floor area or 108 000 m^3 in volume, it must be:

(i). Protected throughout with a sprinkler system complying with Specification E1.5; and
(ii). Provided with a perimeter vehicular access complying with C2.4 (b)

If the buildings are closer than 6 m to each other they are regarded as one building and must collectively comply with the relevant requirements of C2.3.

These DTS provisions may be replaced by an alternative building solution provided the consent authority is satisfied that the alternative solution satisfies the performance requirements of the BCA.

3.0 BCA REQUIREMENTS

The table below contains the applicable Deemed-to-Satisfy Provisions (DTS) of Parts B, C, D, E and F of Volume One of the BCA together with comments regarding the proposal's ability to satisfy each of the clauses. The following abbreviations have been used in this table:

N/A The DTS clause does not apply to the subject Building.

Complies The relevant provisions of the DTS clause will be satisfied by the proposed design.

CRA Compliance is readily achievable without significant change to the design documentation

DNC Does not comply.

DTS Deemed-To-Satisfy provisions of the Building Code of Australia.

FRL Fire-resistance Level expressed in minutes and determined in the following order: structural adequacy/integrity/insulation.

3.1. BCA Compliance Assessment

SECTION B – STRUCTURE			
Part B1 – Structural Provisions			
Clause	Description	Status	Comments
B1.1	Resistance to actions	CRA	The resistance of a building or structure must be greater than the most critical effect resulting from different combinations of actions. The building must be designed and certified by a professional structural engineer before a Construction Certificate is issued.
B1.2	Determination of individual actions	Noted	The magnitude of individual actions must be determined in accordance with Clause B1.2 of the BCA.
B1.3			No provisions.
B1.4	Determination of structural resistance of materials and forms of construction	Noted	The structural resistance of materials and forms of construction must be determined in accordance with the relevant Australian Standards in accordance with Clause B1.4 of the BCA.
B1.5	Structural software	Noted	Any software used must comply with the approved ABCB protocol.
B1.6	Construction of buildings in flood hazard areas	N/A	A Class 2, 3, 4, 9a (health-care) or 9c building in a flood hazard area must comply with the ABCB Standard. These classes are not included in this proposal

SECTION C – FIRE RESISTANCE			
Part C1 – Fire Resistance and Stability			
Clause	Description	Status	Comments
C1.1	Type of construction required	Complies	The building will be used to grow, pack and load mushrooms and will therefore be a Class 8 building. A single storey Class 8 building is required to be of Type C Construction. The external walls of the building will be at least 31m from a fire source feature and therefore, a FRL is not required.
C1.2	Calculation of rise in storeys	Noted	The buildings have a rise in storeys of one (1) and contain one (1) storey.
C1.3	Buildings of multiple classification	N/A	The classification of the top storey of a building is applied to all stories in determining the type of construction of the building. This will be single storey building that does not contain multiple classifications.
C1.4	Mixed types of Construction	N/A	If a fire wall divides the building in accordance with C2.7, the separated buildings can be constructed with different fire- resistance levels determined in accordance with Clause C1.1 and C1.3. There are no fire walls in the building and it is not proposed to fire separate any part of the building.
C1.5	Two storey Class 2,3 or 9c buildings	N/A	A Class 2 building having its own direct access to a road or open space and a rise of 2 storeys may be of Type C construction. The proposal does not include a Class 2 building.
C1.6	Class 4 parts of buildings	N/A	A Class 4 part of a building requires the same FRL for building elements and separation as that of a Class 2 part. The proposal does not include a Class 4 part.
C1.7	Open spectator stands and indoor sports stadiums	N/A	There are no stands or stadiums proposed for the buildings
C1.8	Lightweight construction	N/A	Lightweight construction used in a wall system must comply with Specification C1.8. Lightweight construction will not be used in this building.
C1.9			No provisions
C1.10	Fire hazard properties	Complies	The fire hazard properties of all floor materials, floor coverings, wall and ceiling lining materials must comply with Specification C1.10 The shed will have a concrete floor, steel and concrete panel walls and a steel framed and sheeted roof.

C1.11	Performance of external walls in fire	N/A	Where used, concrete external walls that could collapse as complete panels (e.g. tilt-up and pre-cast concrete) in a building having a rise of not more than 2 storeys, must comply with Specification C1.11. This construction type will not be used in this proposal.
C1.12	Non-combustible materials	Noted	Gypsum, metal and laminated non-combustible materials containing combustible components are deemed to be non-combustible.
Part C2 – Compartmentation and Separation			
C2.1	Application of Part	Noted	Clauses C2.2, C2.3 and C2.4 do not apply to a sprinkler protected carpark, open deck carpark or open spectator stand. Clause C2.12 (a) (v) does not apply to an electricity network substation.
C2.2	General floor area limitations	Noted	In accordance with the deemed-to-satisfy (DTS) provisions, the requirements for a large isolated building apply where the floor area or volume Class 7 and 8 buildings exceeds 2,000m^2 or 12,000m^3. The proposed building will have a floor area of 8,800m^2 and volume of 49,282m^3. Therefore, the large isolated building requirements apply.
C2.3	Large isolated buildings	CRA	These DTS provisions require that the building must have an 18m wide open space and a 6m roadway around the building or be provided with a sprinkler system and vehicular access. The details indicate that the open space around the building will be at least 31m and that a pathway at least 6m wide will be provided. Details of the construction of the roadway are not shown. Further details need to accompany the Construction Certificate to determine how these provisions will be complied with. An alternative solution could be developed to demonstrate that the performance requirements can be satisfied without reliance on the DTS provisions. This solution needs to satisfy the Council that, due to the special circumstances in these buildings, the risk to the occupants does not exceed the risk that they would be exposed to in a DTS complying building.
C2.4	Requirements for open spaces and vehicular access	Noted	Required vehicular access must be contained on the allotment, have an unobstructed width of at least 6m and allow the forward movement of emergency vehicles from a public road around the building.

C2.5	Class 9a and 9c buildings	N/A	This proposal does not contain these building classes.
C2.6	Vertical separation of openings in external walls	N/A	The requirements apply to a building required to be of Type A construction. This building is required to be Type C construction.
C2.7	Separation by fire walls	N/A	If the classes are separated by a fire wall, the classifications are considered to be in different buildings and the FRL's are determined based on the different classifications. The same classification applies to all of the proposed building and it will not be fire separated.
C2.8	Separation of classifications in the same storey	N/A	Each building element in storeys where classifications are located alongside each other must have the higher FRL prescribed for each classification. If the uses are separated by a fire wall, the building is considered to be separate and the FRLs are determined depending on the classification applying to the location. The same classification applies to all of the proposed building.
C2.9	Separation of classifications in different storeys	N/A	Where different classifications are located above one another in adjoining storeys, they must be separated by construction with specified FRLs. The buildings will be single storey.
C2.10	Separation of lift shafts	N/A	Any lift connecting more than 2 storeys in a building not sprinkler protected must be separated from the remainder of the building with material that achieves a FRL appropriate to that storey. Lifts will not be installed in this building.
C2.11	Stairways and lifts in one shaft	N/A	A stairway and lift must not be in the same shaft if either the stairway or the lift is required to be in a fire-resisting shaft. This does not apply to this building.
C2.12	Separation of equipment	N/A	Equipment that comprises lift motors, lift control panels, central smoke control plant, boilers or batteries must be separated from the remainder of the building by construction with an FRL as required under Specification C1.1 but not less than 120/120/120 and any doorways in that construction must be protected with a self-closing, --/120/30 fire door. This equipment is not installed in this building.

C2.13	Electricity supply system	Noted	The following electricity supply equipment: • electrical substation • main switchboard which sustains emergency equipment operating in emergency mode • electricity conductors which supply substation or main switchboard must be separated from the remainder of the building by construction with an FRL of not less than 120/120/120. Any doorways in that construction must be protected with a self-closing, --/120/30 fire door.
C2.14	Public corridors in Class 2 and 3 buildings	N/A	Public corridors must be divided at intervals of not more than 40m by smoke-proof walls complying with Clause 2 of Specification C2.5. The proposal does not include Class 2 or 3 buildings.
Part C3 – Protection of Openings			
C3.1	Application of Part	Noted	Concessions and definition of certain openings.
C3.2	Protection of openings in external walls	N/A	Openings within 3m of an allotment boundary shall be protected by sprinklers, fire doors, fire windows etc., in accordance with C3.4 of the BCA. All openings will be more than 3m from fire source features.
C3.3	Separation of external walls and associated openings in different fire compartments	N/A	Openings in external walls of different fire compartments that are located at certain distances from each other specified by the angle between the walls must be protected. The building will be a single fire compartment.
C3.4	Acceptable method of protection	N/A	Window openings that are required to be protected must incorporate: • wall wetting sprinklers or --/60/-- fire windows for windows that are automatic closing or permanently fixed in the closed position; or • --/60/60 automatic fire shutters. Other openings that are required to be protected are to be protected by internal or external wall-wetting sprinklers or have construction with an FRL not less than --/60/--. All openings do not require protection.
C3.5	Doorways in fire walls	Noted	Doorways in fire walls must be protected by self-closing fire doors. The building does not have any fire walls. If fire walls are constructed as part of an alternative solution, the protection must be provided.

C3.6	Sliding fire doors	N/A	Sliding fire doors held open when the building is being used, must close when the hold open device is de-activated and be provided with an alarm and warning signs. Sliding fire doors are not proposed for this building
C3.7	Protection of doorways in horizontal exits	N/A	Doorways in horizontal exits must be protected by self-closing or automatic doors actuated by a fire alarm system when these are installed in the fire compartment. Horizontal Exits are not proposed for this building.
C3.8	Openings in fire isolated exits	Noted	--/60/30 self-closing fire doors are required to doorways providing access to fire isolated passageways. A fire isolated passage is not required for this proposal. If a passageway is proposed by an alternative solution, the requirements will be complied with.
C3.9	Service penetrations in fire isolated exits	N/A	Fire-isolated exits must not be penetrated by any services other than electrical wiring for essential fire service installations, pressurisation ducts with an FRL of -/120/60, or water pipes for fire services. Fire isolated exits are not proposed for this building.
C3.10	Openings in fire isolated lift shafts	N/A	Openings in lift shafts are to be protected by --/60/-- fire doors complying with AS1735.11. Lift indicator panels are to be backed by construction having an FRL of not less than --/60/60 if it exceeds 35,000mm^2 (175mm X 200 mm). Lift shafts are not proposed for this project.
C3.11	Bounding construction: Class 2, 3, 4 and 9 buildings	N/A	A doorway in a Class 4 part of a building providing access to another part of the building must be protected by a self-closing, tight fitting, solid core door not less than 35mm thick. The building does not contain a Class 2, 3, 4 or a 9 part.
C3.12	Openings in floors and ceilings for services	Noted	Services passing through floors and ceilings requiring an FRL are to be placed within fire resisting shafts or in accordance with Clause C3.15. Unless forming part of an alternative solution fire rated floors and ceilings are not proposed for this building

C3.13	Openings in shafts	N/A	In a building of Type A construction, an opening in a wall providing access to a ventilating, pipe, garbage, or other service shaft must be protected by: • If it is a sanitary compartment - a door or panel which together with its frame, is non-combustible or has an FRL of not less than --/30/30; or • A self-closing --/60/30 fire door or hopper; or • An access panel with an FRL of not less than --/60/30; or • If the shaft is a garbage shaft - a door or hopper of non-combustible construction. The building is not required to be of Type A construction.
C3.14	-		No provisions
C3.15	Openings for service installation	N/A	Where services (e.g. hydraulic, mechanical, plumbing, electrical) penetrate a building element that is required to achieve an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire then, that installation must be protected / sealed (e.g. fire collars, fire dampers etc.) by material that is identical to tested prototypes and in accordance with AS4072.1 and AS1530.4, and having achieved the required FRL or resistance to the incipient spread of fire or other specified method. It is not proposed to penetrate elements with a FRL.
C3.16	Construction Joints	N/A	Construction joints between elements required to be fire resisting must be installed in accordance with a tested prototype in accordance with AS1530.4. The building elements are not required to be fire resisting
C3.17	Columns protected with lightweight construction	N/A	Columns must be protected in accordance with the identical tested prototype. Lightweight construction will not be used in this building.
SECTION D – ACCESS AND EGRESS			
Part D1 – Provision for Escape			
Clause	Description	Status	Comments
D1.1	Application of Part	Noted	This Part does not apply to the internal parts of a sole occupancy unit in a Class 2, 3 or 4 building.
D1.2	Number of exits required	Complies	The effective height of the building is less than 25m. All parts of the building have access to at least one (1) exit.

D1.3	When fire isolated exits are required	N/A	The building does not contain a stairway that passes through 2 storeys and therefore is not required to be fire-isolated.
D1.4	Exit travel distances	DNC	The distance to a single exit serving a storey at the level of access to a road or open space in Class 6 building may be 30m. In a Class 5,7b or 8 building the maximum distance is 20m. As the travel distance to a single exit will exceed 20m in the growing rooms, alternate exits are required. No point on the floor is permitted to be more than 20m from a point where there is a choice between alternative exits and one of the exits must be within 40m of this point. Doors must open to a road or open space to be accepted as an exit. The alternative exits from the growing rooms and store/packing/workshop areas open to the internal corridor and therefore do not qualify as an exit. As the growing rooms are at least 95m long, the travel distance to the alternative exits far exceed the maximum permissible 40m distance. Extension of the DTS travel distances could be permitted if an alternative solution demonstrates that the performance requirements can be met. The alternative solution should be based on a fire engineering analysis of the circumstances of this particular case. The analysis must demonstrate that the available required egress time for all occupants of the building exceeds the required time.
D1.5	Distances between alternative exits	DNC	Storeys requiring alternative egress must have exits distributed as uniformly as practicable and be not less than 9m apart or more than 60m apart. The minimum distance between exits will be 95m and therefore this proposal does not comply with these requirements. If the DTS provisions cannot be met, an alternative solution that demonstrates that the performance requirements can be satisfied will be required.

D1.6	Dimensions of exits	Noted	In a required exit or path of travel, the unobstructed height throughout must be not less than 2m, except the unobstructed height of any doorway may be reduced to not less than 1980mm. The unobstructed width of each exit or path of travel to an exit except a doorway must not be less than 1m. The unobstructed width must be measured clear of all obstructions such as handrails, projecting parts of balustrades or other barriers and the like.
D1.7	Travel via fire-isolated exits	Noted	Fire-isolated exits are not required for this proposal. If, however, they are required by an alternative solution to address travel distance limitations, the requirements must be complied with.
D1.8	External stairways in lieu of fire-isolated exits	N/A	External exits are not proposed for this development.
D1.9	Travel by non-fire-isolated stairways or ramps	N/A	Non-fire- isolated stairways or ramps are not proposed for this development.
D1.10	Discharge from exits	CRA	An exit must not be blocked at its point of discharge and where necessary suitable barriers such as bollards are to be provided to prevent the blockage of exits by vehicles. The discharge must be provided with bollards.
D1.11	Horizontal exits	N/A	Horizontal exits do not form part of the proposed egress system.
D1.12	Non-required stairs, ramps or escalators	N/A	Non-required stairs, ramps or escalators are not proposed for these buildings.
D1.13	Number of persons accommodated	Noted	The BCA permits an assessment of capacity based on the intended purpose and layout of the building. The original mushroom farm proposal identified a workforce of 165 workers. This modified proposal will accommodate 113 workers at full capacity accumulating as follows: Stage 1: 40 workers Stage 2: 83 workers Stage 3: 83 workers Stage 4: 88 workers Stage 5: 103 workers Stage 6: 113 workers. The expected reduction in the workforce is based on the efficiencies resulting from the introduction of computer mushroom harvesting technologies.
D1.14	Measurement of distance	Noted	These requirements will be complied with when taking measurements.

D1.15	Method of measurement	Noted	These requirements will be complied with when taking measurements
D1.16	Plant rooms and lift machine rooms: Concession	Noted	These concessions will be utilised when assessing compliance of any plant rooms and lift machine rooms.
D1.17	Access to lift pits	N/A	Lifts are not proposed to be installed in the buildings.
Part D2 – Construction of Exits			
D2.1	Application of Part	N/A	These provisions detail the variations to the application of the requirements to Class 2, 3, 4 parts and 9b (NSW Variation) buildings. These classifications are not included in this proposal.
D2.2	Fire isolated stairs or ramps	Noted	Fire isolated stairway or ramps are not required for this proposal. If, however, they are required by an alternative solution to address travel distance limitations, the requirements must be complied with.
D2.3	Non-fire-isolated stairways and ramps	N/A	Required stairs that are not required to be within a fire-resting shaft and are located in a building with a rise of more than 2 storeys, must be constructed of specified materials. The building has a rise of 1 storey.
D2.4	Separation of rising and descending stair flights	N/A	The proposal does not include a basement.
D2.5	Open access ramps and balconies	N/A	Fire isolated exits are not required for this proposal and all external landings are unenclosed.
D2.6	Smoke lobbies	N/A	Smoke lobbies are not required for this building.
D2.7	Installations in exits and paths of travel	Noted	Electrical boards and the like are to be located within and enclosed by non-combustible construction or have a fire-protective covering with the doorway suitably sealed against smoke spreading from the enclosure.
D2.8	Enclosure of space under stairs and ramps	Noted	The space below non fire-isolated stairs must not be enclosed to form a cupboard or similar enclosed space unless the enclosing walls have an FRL of not less than 60/60/60 and any doorway to the enclosed space is fitted with a self-closing --/60/30 fire door.
D2.9	Width of stairways	Noted	Stairway width is to be measured clear of obstructions such as handrails, projecting parts of balustrades or other barriers and the like and extend to a height of not less than 2m.
D2.10	Pedestrian ramps	Noted	Ramps serving as a required exit must not have a gradient steeper than 1:8. If the ramp is required for disabled access under Part D3 it must comply with AS1428.1. The surface of the ramp must have a non-slip finish.

D2.11	Fire-isolated passageways	Noted	The FRLs for fire-isolated passageways do not apply to this proposal. If, however, fire-isolated passageways are required by an alternative solution to address travel distance limitations, the requirements must be complied with
D2.12	Roof as open space	N/A	Exits do not discharge to the roof of the buildings.
D2.13	Goings and risers	Noted	Stairs are to have risers measuring between 115-190mm and goings between 250-355mm. Goings and Risers are to satisfy the equation of 2R+G=700(max) and 550(min). Goings and risers are to be consistent throughout in one flight. Any gap between risers must not permit a 125mm sphere to pass through it. All treads to be fitted with non-slip finish or non-skid strips and 30% colour contrasting nosings.
D2.14	Landings	Noted	Landings must comply with the requirements of Clause D2.14 of the BCA. Landings must be not less than 750mm long and have a non-slip finish throughout or an adequate non-skid strip near the edge of the landing where it leads to a flight below and 30% colour contrasting nosings.
D2.15	Thresholds	Noted	A threshold of a doorway must not incorporate a step or ramp at any point closer to the doorway than the width of the door leaf unless the door opens to a road or open space, external stair landing or external balcony and the doorsill is not more than 190mm above the finished surface of the ground balcony or the like to which the door opens.
D2.16	Balustrades	Noted	Balustrades complying with DTS provisions of the BCA are to be provided where the distance from the surface to the level below is 1m or more. Balustrades must also be provided where it is possible for a person to fall through an openable window and where the distance to the surface below is more than 4m. Where the level to the surface below is 4m or more, a balustrade or other barrier must not facilitate climbing of horizontal elements between 150mm and 760mm above the floor. Any opening in the balustrade must not permit a 125mm sphere to pass through the balusters. Any wire balustrades must be constructed to comply with Clause D2.16 (h) and Tables D2.16a and D2.16b.

D2.17	Handrails	Noted	Handrails are to be provided to at least one side of stair flights within fire isolated stairs and both sides in any other case (See D3) and located not less than 865mm above the nosings of stair treads and the floor surfaces of landings.
D2.18	Fixed platforms walkways, stairways and ladders	Noted	Fixed platforms, walkways, stairways, ladders, landings, handrails, balustrades and any tread or riser in a plant room, lift motor room or the like is to comply with AS1657.
D2.19	Doorways and doors	CRA	A doorway serving as a required exit or forming part of a required exit must not be fitted with a roller shutter unless it serves a Class 6, 7 or 8 building or part with a: (i) floor area of not more than 200 m^2; (ii) the doorway is the only required exit from the building; (iii) it is held in the open position while the building or part is lawfully occupied. The doorway must not be fitted with a sliding door unless it leads directly to a road or open space; and is able to be opened manually under a force of not more than 110 N. All doorways forming part of required exits in the building must be fitted with swinging doors constructed to comply with the requirements of Part D of the BCA. The proposed sliding doors must comply with the maximum force requirements. If the roller doors located at either end of the internal corridor connecting the growing rooms will form part of the building's egress system, the construction must incorporate an independent swinging exit door. Documentary evidence of the method of complying with these requirement must be submitted with the construction certificate application..
D2.20	Swinging doors	Noted	All exit doors must swing in the direction of egress as required. They must not impede the path or direction of egress.
D2.21	Operation of latch	Noted	The latch of a door in a required exit, forming part of a required exit or in the path of travel is to be readily openable without a key from the side that faces a person seeking egress. It is to have a single downward action or pushing action and to be located between 900mm and 1100mm from the floor.
D2.22	Re-entry fire-isolated exits	N/A	Fire isolated exits are not included in this proposal.
D2.23	Signs on doors	N/A	Fire and smoke doors are not included in this proposal.

D2.24	Protection of openable windows	N/A	The required protection applies to Class 2 or 3 buildings or Class 4 parts. This proposal does not include these classifications.
SECTION D3.3 – ACCESS FOR PEOPLE WITH DISABILITIES			
D3.0	Deemed-to-Satisfy Provisions	CRA	Disability (Access to Premises — Buildings) Standards 2010 is to be read in conjunction with the BCA. The proposal is located on a large site with a fall of less than 1% across a building with a length of almost 465m. Compliance with the Access Codes should be readily achieved. Details of compliance with Part D3 of the BCA must be provided with the documentation accompanying the construction certificate application.
D3.1	General Building Access Requirements	CRA	Buildings and parts of buildings must be accessible as required by Table D3.1, unless exempted by D3.4 Compliance with Part D3 of the BCA is applicable to these buildings. All areas normally used by the occupants must be accessible.
D3.2	Access to Buildings	CRA	The paths providing access to the principal entry to the building must be accessible. Sufficient, accessible entry ways to the building must be provided. All doors must have a minimum clear opening width of not less than 850 mm and the required circulation spaces around doors must be accessible in accordance with AS 1428.1.
D3.3	Parts of Buildings to be accessible	Noted	Accessway construction must comply with the requirements of this clause.
D3.4	Exemptions	Noted	The following areas are not required to be accessible: (a) An area where access would be inappropriate because of the particular purpose for which the area is used; (b) An area that would pose a health or safety risk for people with a disability; or (c) Any path of travel providing access only to an area exempted by (a) or (b).
D3.5	Accessible Car parking	CRA	Any accessible car space must comply with the space requirements of AS2890.6 for a person with a disability. Details of the location and dimensions of accessible car spaces must be provided with the documentation accompanying the construction certificate application.

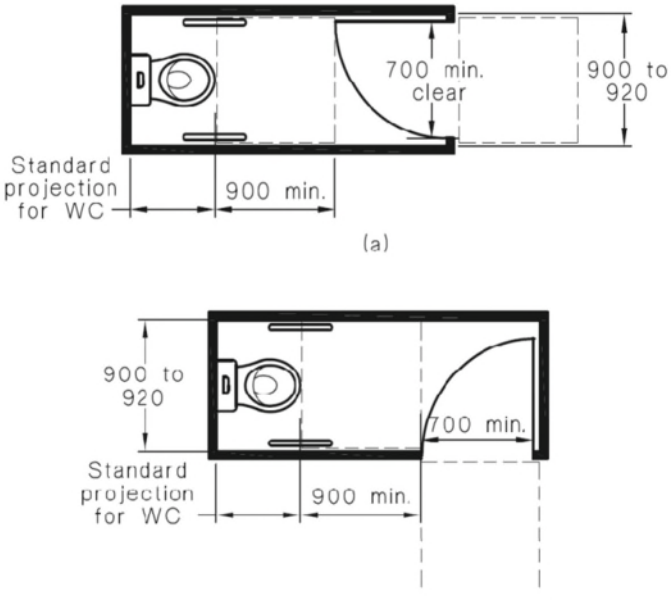
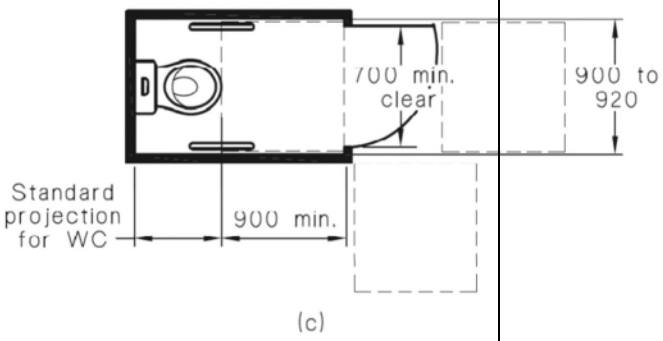
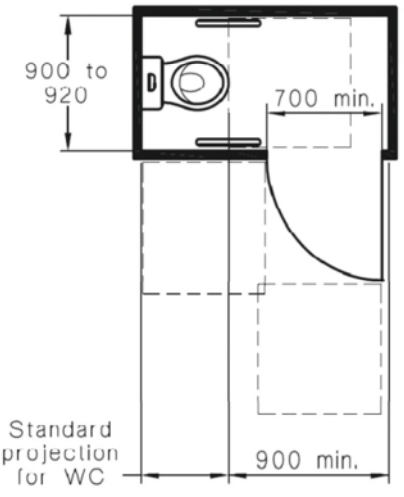
D3.6	Signage	CRA	In a building required to be accessible – Braille and tactile signage complying with Specification D3.6 and incorporating the international symbol of access or deafness, as appropriate, in accordance with AS1428.1 must identify each – – Sanitary facility, – Ambulant toilet facility, – Any required accessible car parking space, – Where needed, directional signage to any – Car parking space or sanitary facility. Appropriate signage must be provided
			
D3.7	Hearing Augmentation	N/A	Hearing augmentation is not required for the uses included in this proposal.
D3.8	Tactile Indicators	CRA	TGAs must be provided at stairways, walkways, ramps, etc., within the building.
D3.9	Wheelchair Seating Spaces in Class 9b Assembly Buildings	N/A	The proposal does not include a Class 9a assembly building.
D3.10	Swimming Pools	N/A	A swimming pool is not included in this proposal.
D3.11	Ramps	N/A	On an accessway – (a) A series of connected ramps must not have a combined vertical rise of more than 3.6m; and (b)A landing for a step ramp must not overlap a landing for another step ramp or ramp.
D3.12	Glazing on an Access way	Noted	On an accessway, where there is no chair rail, handrail or transom, all frameless or fully glazed doors, sidelights, and any glazing capable of being mistaken for a doorway or opening, must be clearly marked in accordance with AS 1428.1
SECTION E – SERVICES AND EQUIPMENT			
Part E1 – Fire Fighting Equipment			
Clause	Description	Status	Comments
E1.1			No Provisions
E1.2			No Provisions

E1.3	Fire Hydrants	DNC	Fire hydrants must be installed in buildings having a total floor area greater than 500m^2. The floor area of the proposal is 8,800m^2. Hydrants are therefore required and details of an installation are not provided in the current documentation. An alternative solution for a system that does not fully comply with AS2419 and only provides external protection of the buildings could be prepared.
E1.4	Hose Reels	DNC	Fire hose reels coverage is required where internal hydrants are installed or where any fire compartment has a total floor area greater than 500m^2. Fire hose reels are required in this building. The details do not indicate that FHR will be provided.
E1.5	Sprinklers	N/A	Sprinklers are required where the building has an effective height of more than 25m, in some large isolated buildings, in a Class 6 building where either the floor area exceeds 3,500m^2 or the volume exceeds 21,000m^3 or in occupancies of excessive hazard. This proposal includes single storey, large isolated buildings. If an open space with vehicular access is provided sprinklers are not required.
E1.6	Portable fire extinguishers	CRA	Portable fire extinguishers are required to be provided in accordance with Table E1.6 of the BCA and AS 2444 for the building.
E1.7	-		No Provisions
E1.8	Fire control centres	N/A	The effective height of the building is less than 25m.
E1.9	Fire precautions during construction	CRA	The proposal will be constructed in stages. The precautions must be complied with as the construction progresses.
E1.10	Provisions for special hazards	N/A	Additional provisions must be made if there are any special firefighting problems. Given the nature of this occupancy, there are no special firefighting problems.
Part E2 – Smoke Hazard Management			
E2.1	Application of Part	Noted	This part does not apply to open deck car parks, open spectator stands or electricity network substations

E2.2	General requirements	DNC	The requirements for a Class 7 or 8 building are that: (a) A building not exceeding 18 000 m^2 in floor area nor exceeding 108 000 m^3 in volume, must be provided with— (i) a sprinkler system and perimeter vehicular access; or (ii) an automatic fire detection and alarm system; or (iii) an automatic smoke exhaust system; or (iv) automatic smoke-and-heat vents; or (v) natural smoke venting. (b) A building exceeding 18 000 m^2 in floor area or 108 000 m^3 in volume, must be provided with— i) if the ceiling height of the fire compartment is not more than 12 m— (A) an automatic smoke exhaust system; or (B) automatic smoke-and-heat vents; or (ii) if the ceiling height of the fire compartment is more than 12 m, an automatic smoke exhaust system . These requirements apply to the building. The plans do not indicate that smoke hazard management systems will be installed in the buildings. A system must be installed unless; an alternative solution demonstrates that given the circumstances of this case, they are not necessary.
E2.3	Provisions for special hazards	N/A	Additional measures are not required as special hazards are not present in this proposal.
Part E3 – Lift Installations			
E3.1			No provisions.
E3.2	Stretcher facility in lifts	N/A	A stretcher facility is required to each emergency lift if the passenger lift serves a storey above an effective height of more than 12 metres. This proposal does not include any storeys with an EH of more than 12m.
E3.3	Warning against use of lifts in fire	N/A	A warning sign is to be displayed where it can be readily seen near every call button of the passenger lift. The warning sign is to comply with the details and dimensions set out in Figure E3.3 of the BCA. This proposal does not include the installation of lifts.
E3.4	Emergency lifts	N/A	The EH of all buildings does not exceed 25m and therefore an emergency lift is not required.

E3.5	Landings	N/A	Access and egress to and from the lift well landings is to comply with the Deemed-to-Satisfy provisions of Section D of the BCA. This proposal does not include the installation of lifts.
E3.6	Facilities for people with disabilities	N/A	A passenger lift within the building is to comply with AS1735.2 and table E3.6b. This proposal does not include the installation of lifts.
E3.7	Fire Services Control	N/A	Passenger lift cars are to be provided with fire service controls in accordance with AS1735.2. This proposal does not include the installation of lifts.
E3.8	Aged care buildings	N/A	This proposal does not contain aged care buildings.
Part E4 – Emergency Lighting, Exit Signs and Warning Systems			
E4.1			No provisions
E4.2	Emergency lighting requirements	CRA	Emergency lighting is required where any point on the floor is more than 20m from a door leading to an open space. Points on the floor of this building are more than 20m to such a door. Emergency lighting is required in the building.
E4.3	Measurement of distance	Noted	Measurements are taken along the shortest path of travel.
E4.4	Design and operation of emergency lighting	Noted	Emergency lighting must comply with AS 2293.1.
E4.5	Exit signs	CRA	Exit signs must be clearly visible to persons approaching the exit and must be installed on, above or adjacent to a door serving as or forming part of a required exit in a storey required to be provided with emergency lighting. Exit signs must be provided in accordance with Clause E4.5 of the BCA.
E4.6	Direction signs	Noted	Where an exit is not readily apparent, exit signs with directional arrows must be installed in appropriate positions in corridors, hallways, lobbies and the like indicating the direction to a required exit in accordance with Clause E4.6 of the BCA.
E4.7	Class 2, 3 and 4 buildings: Exemptions	N/A	This proposal does not include Class 2 or 3 buildings or Class 4 parts.
E4.8	Design and operation of exit signs	Noted	Exit signs are to operate in accordance with AS 2293.1 and be clearly visible at all times while the building is occupied.
E4.9	Sound systems and intercom systems for emergency purposes	N/A	These systems are required in some Class 3 and 9 buildings and buildings over 25m in EH. The proposal is less than 25m in EH and does not include these classifications.

SECTION F – HEALTH AND AMENITY			
Part F1 – Damp and Weatherproofing			
Clause	Description	Status	Comments
F1.1	Stormwater drainage	CRA	The stormwater system must comply with the requirements of AS/NZS 3500.1
F1.2			No provisions
F1.3			No provisions
F1.4	External above ground membranes	Noted	Membranes must comply with AS 4654.
F1.5	Roof coverings	CRA	Metal sheeting coverings must comply with AS 1562.1.
F1.6	Sarking	CRA	Sarking must comply with AS/NZS 4200 Parts 1 and 2.
F1.7	Waterproofing of wet areas	CRA	Shower enclosure surfaces, floor surfaces in bathrooms, shower rooms, slop hoppers, sink compartments, laundry and sanitary compartments are required to be waterproofed in accordance with AS 3740. The amenities proposed for the building must comply.
F1.8			No provisions
F1.9	Damp-proofing	Noted	Unless there are particular circumstances requiring the installation of damp-proofing, it can be omitted in Class 7 and 8 buildings. It is recommended damp-proofing be installed to promote occupant comfort.
F1.10	Damp-proofing of floors on the ground	Noted	Damp-proofing of floors can be omitted in a Class 7 and 8 building. It is recommended damp-proofing be installed to promote occupant comfort. Where a vapour barrier is installed in the proposed construction, it must comply with AS 2870.
F1.11	Provisions of floor wastes	N/A	Only applies to a Class 3 or 4 building and Class 4 parts.
F1.12	Sub-floor ventilation	N/A	The floor will be a concrete slab on the ground.
F1.13	Glazed assemblies	CRA	Windows, sliding doors with a frame, adjustable louvres, shopfronts and window walls with one piece framing in an external wall must comply with AS 2047 requirements for resistance to water penetration. It is recommended the assemblies comply with AS 2047 to promote occupant comfort
Part F2 – Sanitary and Other Facilities			
F2.1	Facilities in residential buildings	N/A	There are no residential uses in this building.

F2.2	Calculation of number of occupants and fixtures	Noted	165 people will occupy this building when it reaches full capacity. Assuming the staffing will consist of 50% males and females, there will be 83 staff of each sex on the site when the development is finalised
F2.3	Facilities in Class 3 to 9 buildings	CRA	The facilities required for the males in the building are: 5 WCs, 3 urinals and 5 hand basins. For the females: 6 WCs, 5 hand basins and an adequate means of disposal of sanitary towels must be installed in the sanitary facilities provided for females.
F2.4	Accessible sanitary facilities 	CRA	At least 1 unisex sanitary compartment is required to be accessible. Only one compartment need be accessible if it is located so that it can be entered without crossing an area reserved for one sex only.
   			
F2.5	Construction of sanitary compartments	CRA	Doors to the fully enclosed toilets are to open outwards, slide or be readily removable from the outside of the sanitary compartment unless there is a clear space of at least 1.2m between the closet pan within the sanitary compartment and the nearest part of the doorway.

F2.6	Interpretation: Urinals and washbasins	Noted	A urinal may be— (i) an individual stall or wall-hung urinal; or (ii) each 600 mm length of a continuous urinal trough; or (iii) a closet pan used in place of a urinal. A washbasin may be— (i) an individual basin; or (ii) a part of a hand washing trough served by a single water tap.
F2.7	Warm water installations	N/A	Not Applicable in NSW
F2.8	Waste management	N/A	These requirements apply to Class 9 buildings only.
Part F3 – Room Sizes			
F3.1	Height of rooms and other spaces	CRA	Ceiling heights must be not less than 2.4m except in a corridor, passageway or a bathroom, shower room or the like where it may be 2.1 m.
Part F4 – Light and Ventilation			
F4.1	Provisions of natural light	N/A	Natural light is not required for this class of buildings.
F4.2	Methods and extent of natural light	N/A	
F4.3	Natural light borrowed from adjoining room	N/A	
F4.4	Artificial lighting	CRA	Artificial lighting must be provided in required stairways, passageways, ramps, sanitary compartments, bathrooms, laundries and to all rooms that are frequently occupied, all spaces *required* to be *accessible*, all corridors, lobbies, internal stairways, other circulation spaces and paths of egress. The artificial lighting system must comply with AS/NZS 1680.0.
F4.5	Ventilation of rooms	CRA	Ventilation must be provided throughout the building by means of natural ventilation complying with Clause F4.6 or mechanical ventilation complying with the requirements of AS1668.2.
F4.6	Natural ventilation	CRA	The area of the openable natural ventilation devices must be at least 5% of the area of the room being ventilated.
F4.7	Ventilation borrowed from adjoining room	Noted	Specifies the rules if ventilation is borrowed from adjoining rooms.
F4.8	Restriction on position of water closets and urinals	CRA	A room containing a WC, etc. cannot open directly on to a workplace normally occupied by more than one person. The facilities must comply with this requirement.
F4.9	Airlocks	Noted	Either an airlock or exhaust mechanical ventilation must be provided to satisfy the provisions in F4.8.

F4.10			No provisions
F4.11	Carparks	N/A	Applies to carparks other than open deck carparks.
F4.12	Kitchen local exhaust	N/A	Applies to commercial kitchens.
Part F5 – Sound Transmission and Insulation			
F5.1	Application of part	N/A	This Part applies to Class 2, 3 and 9c buildings only.
F5.2	Determination of airborne sound insulation ratings	N/A	
F5.3	Determination of impact sound installation ratings	N/A	
F5.4	Sound insulation rating for floors	N/A	
F5.5	Sound insulation rating of walls	N/A	
F5.6	Sound insulation rating of services	N/A	
F5.7	Isolation of pumps	N/A	

3.2. BCA Commentary

3.2.1 Section G to J of Volume One

The only requirements of Part G that apply to this proposal relates to minor structures. The BCA requires that a refrigerated or cooling chamber, strongroom or vault which is of sufficient size for a person to enter must have—
(i) a door which is capable of being opened by hand from inside without a key; and
(ii) internal lighting controlled only by a switch which is located adjacent to the entrance doorway inside the chamber, strongroom or vault; and
(iii) an indicator lamp positioned outside the chamber, strongroom or vault which is illuminated when the required interior lights are switched on; and
(iv) an alarm that is—
(A) located outside but controllable only from within the chamber, strongroom or vault; and
(B) able to achieve a sound pressure level outside the chamber, strongroom or vault of 90 dB(A) when measured 3 m from the sounding device.

Required doors in a refrigerated or cooling chamber must have a doorway with a clear width of not less than 600 mm and a clear height not less than 1.5 m.

Section H of the BCA does not apply to this building and while Section I has been retained in the code, the requirements of Parts I1 and I2 have been removed. In New South Wales the maintenance requirements for fire safety equipment is found in the Environmental Planning Assessment Act and Regulation (see Section 4.0 of this report for further details).

The requirements of Section J apply to the building. These requirements relate to the design and construction of buildings to meet energy efficiency goals. The level of detail needed to demonstrate compliance with the requirements is most appropriately provided at the construction certificate stage of a development.

4.0 FIRE SAFETY MEASURES

Details on the proposed fire safety schedule are included in the following schedule.

4.1. Proposed Fire Safety Schedule

Essential Fire and Other Safety Measures	Standard of Performance	Proposed
Vehicular access around large isolated buildings	BCA C2.3, C2.4	√
Fire hydrants	BCA E1.3 AS 2419.1 – 2005	√
Fire Hose reels	BCA E1.4 As 2441 – 2005	√
Portable fire extinguishers	BCA E1.6 AS 2444 – 2001	√
Automatic fire suppression systems	BCA E2.2 Specification E1.5 AS 2118.1 – 1999 (Sprinklers)	√
Automatic fire detection and alarm system	BCA E2.2 Cl. 7 Specification E2.2a	
Automatic smoke exhaust systems	BCA E2.2 Specification E2.2b	√
Smoke and heat vents	BCA E2.2 Specification E2.2c	√
Exit signs	BCA E4.5, E4.6 and E4.8 AS/NZS 2293.1 –2005 or Specification E4.8	√
Emergency Lighting	BCA E4.2 and E4.4 AS/NZS 2293.1 –2005	√

4.2. Certification of Essential Fire Safety Measures

Section 153 of the Environmental Planning and Assessment Regulations 2000 requires that the owner of the building, before commencing the change of use of a building, furnish a Final Fire Safety Certificate with regard to each essential fire safety measure identified in the adopted Fire Safety Schedule. The final fire safety certificate must state that each essential fire safety measure specified in the fire safety schedule for the building to which the certificate relates:

(a) has been assessed by a properly qualified person, and

(b) was found, when it was assessed, to be capable of performing to at least the standard required by the current fire safety schedule for the building for which the certificate is issued.

Every year, the owner(s) will need to sign and submit an Annual Fire Safety Statement to the Council and the NSW Fire and Rescue, which confirms that all essential fire safety measures have been tested and maintained and perform to the original design and installation standard. A copy of the Annual Fire Safety Statement must also be displayed in a prominent area of the building.

5.0. CONCLUSION AND RECOMMENDATIONS

This development proposal involves the construction of a building and modifications to the site to facilitate its use as a mushroom farm. While the existing cottage will be retained, the remainder of the proposal (buildings and site alterations) will be new work. The proposed building must comply with the relevant performance requirements of the BCA. This can only be achieved by either satisfying the DTS provisions, developing an alternative solution demonstrating compliance with the performance requirements or at least, equivalence with the DTS provisions, or a combination of both compliance options.

The principal requirements that the proposed additions and buildings must meet to satisfy the requirements of the BCA are that:

a) Provide a structural engineer's report detailing how the proposed building will resist all load to which it is likely to be subjected to (B1);
b) Either comply with the requirements for large isolated buildings or prepare an alternative solution demonstrating how the performance requirements will be satisfied by the building (C2.3);
c) Either comply with the egress provisions of the BCA or prepare an alternative solution demonstrating how the performance requirements will be satisfied (Parts D1 and D2);
d) Provide bollards or other suitable barriers to ensure that the exits are not blocked at the point of discharge (D1.10);
e) Provide facilities and access for people with a disability to and within the building (Part D3 and F3);
f) Install fire hydrants in accordance with Part E1 of the BCA or prepare an alternative solution demonstrating how the performance requirements will be satisfied (E1.3);
g) Install fire hose reels in the building (E1.4);
h) Install portable fire extinguishers in accordance with the requirements of Table E1.6 of the BCA and AS2444 (E1.6);
i) Demonstrate how fire precautions during construction will be implemented (E1.9);
j) Install a smoke hazard management system complying with Table E2.2a in the building or prepare an alternative solution demonstrating how the performance requirements will be satisfied (E2.2);
k) Install emergency lighting complying with AS2293.1 throughout the building (E4.2 and E4.4);
l) Install exit and direction signs complying with AS2293.1 above or adjacent to required exits and in other appropriate locations to indicate the direction of the exit (E4.5 and E4.8)
m) Ensure the building is water and weather proofed in accordance with Part F1 of the BCA;
n) Provide 5 WCs, 3 urinals and 5 hand basins for males and 6 WCs, 5 hand basins and adequate means for the disposal of sanitary towels in the facilities allocated for use by females (F2.4);
o) Construct accessible sanitary facilities in the building (F2.3 and F2.4);
p) Provide artificial lighting and natural or mechanical ventilation to all rooms (F4.4 and F4.5);
q) Comply with the requirements of Part G1 of the BCA for any refrigerated or cooling chambers that are of sufficient size to allow the entry of a person located within the buildings (G1.2); and
r) Provide a report verifying that the energy efficiency requirements of Section J of the BCA will be satisfied in the new buildings.

When the compliance options have been finalised and necessary reports completed, the plans and specifications should incorporate details of how compliance will be achieved at each stage of construction, completion and occupation of the building.