NZMAA
Large Model SIG

Code of Practice

Version 6 : 15/9/08

Large Model SIG Code of Practice

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Version Control

Version	Clause /Description/ changes	Date	Approved
5	Initial public Issue	15/10/07	LM Sig/NZMAA
6	Servo sizing revised	15/9/08	LM Cmtee

1.Foreword

This code of practice has been prepared by members of the Large Model Special Interest Group of the NZMAA to promote the safe construction and operation of large models in NZ.
The certification process for models in excess of a specified weight and/or power plant is included to ensure compliance with New Zealand CAA requirements and NZMAA safety standards.
Whilst every effort has been made to avoid errors or omissions , the authors of this COP cannot be held responsible for any eventuality arising from the application of this code of practice.
Safe operation and construction of any large model remains the sole responsibility of the builder/owner/pilot of the model.

2.Introduction

The requirements of this Code of Practice should be read in conjunction with the NZMAA Members manual and the prevailing CAA requirements. Large models are traditionally of a nature that have larger size power plants and require a thorough understanding of model construction techniques by the builder of the model. Forces and stresses on control surfaces require greater consideration of adequate control linkages and servos than that experienced in the smaller models. The prevalence of ARF type large models makes it difficult to ensure structural integrity of a model and consequently this COP also incorporates requirements in relation to such ARF models.
Pre flight inspection checks play an important role in the safety aspects and have proven in the past to have prevented dangerous situations from occurring.
The Large Model Certification Scheme is not only required for CAA compliance but, even more importantly, ensures that models are designed constructed and powered appropriately to maximise safety.

3.Definitions

CAA: Civil aviation Authority of New Zealand

Inspector: A person appointed by the Large Model SIG Committee to advise the owner of a project requiring large model certification and to approve, as appropriate, the model's design and construction and flight testing. Inspectors are appointed to projects on the basis of sufficient relevant knowledge and experience.

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Large Models: The Large Model SIG recognizes the following Categories of large model, that legally give effect to CAA regulations, and to NZMAA rules as follows:

Category 1: **Models 15kg – 25kg**

Authority is delegated to NZMAA by CAA to issue Permits to Fly to owners of radio controlled model aircraft in the weight range 15kg – 25kg. It is illegal under NZ law for models of this weight to be flown

without written permission from NZMAA. Certification is also required by NZMAA safety rules.

Category 2: **Models 25kg – 100kg (in law, actually 'pilotless aircraft')**

CAA authorizes NZMAA to manage the certification process and to recommend that CAA issues written permits to owners of pilotless aircraft in the range 25kg – 100kg, to be flown for recreational use only. NZMAA has sole authority from CAA to inspect such aircraft, to make recommendations to CAA, and to issue Permits to Fly at Public Sites, relating to aircraft/pilot combinations. Certification is also required by NZMAA safety rules.

Category 3: Models less than 15kg but with IC motors 75cc or electric motors 5,000 watts input or larger

NZMAA safety rules require that these models be certificated.

The process for achieving certification in these categories is described in Section 8 of this COP.

The Large Model SIG recognizes the following four **additional specifications** of models as being **Large** in the context of being eligible to fly at MANZ rallies:

(a) Monoplane with wingspan at least 2m.
(b) Biplane or multi-plane with wingspan at least 1.5m.
(c) Aircraft with sum of wingspan and length at least 3.5m.
(d) Rotorcraft with rotor diameter at least 2m or with sum of rotor diameter(s) and length at least 3.5m.

NZMAA: New Zealand Model aeronautical association (Incorporated) also known as Model flying NZ

Public Site: Any flying site, approved by NZMAA, where members of the public may be present during the flight operations of model aircraft

Shall: Indicates an obligation to comply.

SIG: Special Interest Group

Weight: The weight taken is that of the complete model less fuel (but including the weight of batteries for electric models).

4.Compliance Documents

Documents under which compliance is obligatory are but not limited to:

(a) NZMAA Members Manual and particularly:
- Chapter 4 Safety
- Annex A CAA requirements
- Chapter 5 Model Specifications
- Annex C R/C proficiency programme

(b) This Code of Practice

5. Safety Criteria

Large Models in any of Categories 1, 2, and 3 (as specified in Definitions) may be flown only if the aircraft has been certificated under the Large Model Certification Process (see Section 8).

All large models shall be checked before the first flight of the day. The Safety Inspection Form in Section 7 specifies the checks that shall be undertaken prior to the first flight of the day. The inspection may be carried forward to subsequent days of a flying rally. The inspection check shall also be undertaken subsequent to any incident / accident – no matter how minor.

The area reserved for R/C flying shall be of sufficient size to enable safe control of large models. As a guide, the area is typically 300 meters by 200 meters but a larger area may be required for particularly large or heavily loaded models. The pits shall be at least 30 meters back from the flight line, and the spectator area shall be behind the pits.

The area over flown by models shall be free of pedestrians, cyclists, occupied vehicles, car parks, and buildings occupied by people. If a person or vehicle enters the area while a model is airborne, flying shall cease, if it is safe to do so, until the area is free. This may require landing in an alternative safe area if the usual landing area is obstructed by people or vehicles. The flight line shall be at least 70 meters in front of any organised public activity not associated with model flying.

All large models shall be flight tested and trimmed with a minimum of five successful flights prior to being flown at any rally or location where spectators are present. (Category 2 models have additional requirements: see the Certification Process document.)

Models shall be restrained during starting.

No taxiing shall occur in pit areas.

Pilots must hold an M classification of Wings Badge.

Motors shall be disabled when models are in the pits. Battery ignition systems shall be switched off and glow plug circuits disconnected when the model is unattended.

Electric powered models shall have the batteries supplying the motor disconnected when in the pits.

There shall be a means to stop all motors from the transmitter.

The frequency control measures a outlined in the NZMAA Members Manual shall be used. Particular note should be made of the control measures associated with synthesised frequency systems. The frequency of these transmitters shall be checked prior to the first flight with a frequency counter and a sticker with the channel number written on it placed over the frequency setting dials.

All additional safety requirements specified in Chapter 4 of the NZMAA Members Manual shall be observed and particular attention shall be paid to spectator safety

6. Criteria for Model Design, Construction, and Equipment

General: The fundamental criterion is that a Large Model must be as safe as practically possible when it is operated from flying sites when the public is present. The standards of design, engineering and construction must conform to current best practice for the chosen technologies and materials, power, and model type. In this context, current best practice is determined by reputable published plans, current publications by knowledgeable authors , reputable kitset manufacturers, and the knowledge and experience of people acknowledged by the Large Model SIG Committee.

Receivers: Dual independent receivers, each with separate power supply and wiring, that provide redundancy for essential lateral and longitudinal controls are mandatory for Category 2 models and are strongly recommended for Category 1 and Category 3. It is recommended that the dual receivers, share each of the primary controls of the aircraft wherever possible. For example one receiver would drive the port aileron and the second would drive the starboard aileron. It is recommended that failsafe be used on at least the throttle channel.

Radio systems that have ‘dual receivers in one package’, including some brands of 2.4GHz systems, have dual output circuits but a common signal processing unit for both output stages. Such units do not qualify as dual receivers for Category 2. However, they do provide relatively more security than single receiver systems. It is recommended that a full investigation of any dual receiver system be undertaken prior to consideration for use as dual redundant receivers in terms of this COP

Dual airborne radio batteries are mandatory for Categories 1, 2 and 3, and are strongly recommended for all other Large models.

The use of fully independent dual 2.4 GHz receivers is currently infeasible so that such systems cannot meet Category 2 requirements. The LM SIG Committee recognizes that developments may change this situation, will keep this matter under review and will advise any consequent changes to the above provisions of this COP.

Flight Batteries: Redundant (dual) flight batteries are mandatory for Categories 1, 2, and 3, and are strongly recommended for all other Large models. This may be

provided by use of separate battery inputs to the receiver or a common supply from a battery backer or a Power Box (or similar) unit.
The total battery capacity shall take into account the number and power of the servos, the required control movement, the size and speed of the model together with the expected number of commands to be exercised in flight. It is recommended that an individual battery capacity of at least 2000 mah be utilised.

Servos: The following **guidelines** relate to the minimum servo torque required to power the primary control surfaces. These guidelines are based on consultation with a large number of experienced modelers both in NZ and overseas. It is recommended that when considering servo sizes due consideration be given to the type / nature of the model and such factors as flying speed and control surface areas. Where servo torque is suggested for a control surface this can be provided by one or more servos working together. The minimum may not be sufficient for fast flying models or those with large control surfaces or throws. It is suggested that if the builder does not have experience with the size and class of model being built that he take into account the recommendations of the designer, best practice with models of similar weight and performance which are published in magazines or on the internet, the experience of other modelers, and relevant information published to calculate required servo performance. For models that require the Certification Process, the Inspector is entitled to require the builder to justify his choice of servos and may require changes
Mechanical or other means of boosting torque supplied to a control surface may be taken into account when considering servo torque requirements on a control surface. This may be in the form a boost tabs or similar systems that assist control surface movements.
In order to reduce likelihood of control surface flutter, each servo shall be mounted with its longitudinal axis parallel to the direction of drive to the control surface. For the same reason, all aspects of the linkage to the control surface shall be free of 'slop'.
To convert kg/cm to oz/in :- multiply the torque (in kg/cm) by 13.88
To convert oz/in to kg/cm:- divide the torque (in oz/in) by 13.88
A useful conversion website can be found at:
http://www.onlineconversion.com/torque.htm

Guidelines for minimum servo torque for primary control surfaces are as follows:

(a)Lighter wing loading and slower Large models not in Categories 1, 2, or 3:
Elevators -If separate elevators, 4 kg.cm per elevator.: if a single elevator 5 kg.cm.
Ailerons – 5 kg.cm each.
Rudder – 8 kg.cm.

(b) Higher wing loading and faster Large models not in Categories 1, 2, or 3:
Elevators – If separate, 8 kg.cm per elevator: if a single elevator, 12 kg.cm.
Ailerons – 9 kg.cm each.
Rudder – 9 kg.cm.

(c) Category 1:

Elevators – If separate, 8kg.cm per elevator: if single elevator, 12 kg.cm.
Ailerons – 12 kg.cm each.
Rudder – 12 kg.
(Note: Inspectors of highly aerobatic models in this Category may require different servo configurations and/or larger servos)

(d) Category 2:
Elevators – two servos totaling 24 kg.cm., either one per separate surface or ganged on single surface.
Ailerons – two servos per aileron totaling 24 kg.cm.
Rudder – 24 kg.cm
(Note: Inspectors may require different servo configurations and/or larger servos for specific models in this Category, especially in the heavier range)

(e) Category 3:
Elevators – two servos totaling 18 kg.cm
Ailerons – two servos per aileron totaling 18 kg.cm
Rudder – 18 kg.cm

Heavy-duty servo connector wiring is required for models Categories 1, 2, and 3 and is strongly recommended for all other Large models.

5. **Control Linkages:** All control linkages, clevises and horns shall be able to withstand the maximum torque output of the servo. When selecting the type and design of pushrods, consideration should be given to the likely forces that will be imposed on the control surfaces, to ensure that bending of pushrods and/or un-commanded deflection of control surfaces does not occur.
Heavy duty hinges are recommended for all control surfaces and careful attention to the required number of hinges in each control surface to ensure control surface integrity in relation to the likely loads on the control surface during flight.
All hinges shall be ‘pinned’ in such a manner to prevent control surface separations.
The gap between the moving control surface and the fixed surface shall be minimized.
Where pushrods / clevises are used for primary control surfaces, the minimum size shall be 4-40 (or 3mm).
Pull/pull systems are recommended where appropriate.
For large aerobatic models, specialized heavy-duty linkages, servo arms, and hinges are recommended.

7. Safety Inspection Form

NZMAA Large Model SIG

INSPECTION CHECKLIST	ACCEPT	REJECT	RECHECK
GENERAL APPEARANCE – Overall appearance	☐	☐	☐
(Check for damage, warps, loose covering etc.)	☐	☐	☐
PROPELLER - secure (check for cracks, damage)	☐	☐	☐
ENGINE – Securely attached (including muffler)	☐	☐	☐
Method to prevent accidental starting	☐	☐	☐
(Ask if able to kill with radio)	☐	☐	☐
LEFT WING – Attachment secure	☐	☐	☐
LEFT WING – Aileron hinges secure	☐	☐	☐
LEFT WING – Control link keeper	☐	☐	☐
LEFT WING - Control pushrod stiffness	☐	☐	☐
ELEVATOR – Hinges secure	☐	☐	☐
ELEVATOR - Control link keeper	☐	☐	☐
ELEVATOR – Control pushrod stiffness	☐	☐	☐
RUDDER - Hinges secure	☐	☐	☐
RUDDER – Control link keeper	☐	☐	☐
RUDDER - Control pushrod stiffness	☐	☐	☐
TAIL SURFACE - Brace wires secure	☐	☐	☐
TAIL SURFACE - Brace wires keepers	☐	☐	☐
RIGHT WING - Attachment secure	☐	☐	☐
RIGHT WING - Aileron hinges secure	☐	☐	☐
RIGHT WING - Control link keeper	☐	☐	☐
RIGHT WING - Control pushrod stiffness	☐	☐	☐
Flying, Landing wires and Struts secure	☐	☐	☐
CANOPY OR WINDSCREEN – Secure	☐	☐	☐
HATCHES OR COVERS – Secure	☐	☐	☐
WHEELS AND LANDING GEAR – Secure	☐	☐	☐
BATTERIES FULLY CHARGED – Ask	☐	☐	☐

Method of Restraint while starting ☐ Control directions OK ☐

Radio Checks:

Crystal based system: Yes/No If yes, frequency …….

2.4 GHz system: Yes/No

Synthesised module system: Yes/No If yes, setting checked against frequency peg ☐

frequency selectors sealed with sticker ☐

AUTHORIZATION: "I certify that the above described aircraft has/have been inspected pursuant to NZMAA safety guidelines."

INSPECTOR:_____

8. Large Model Certification Process

Purpose

The broad purpose of the Certification Process is to encourage and support the building and flying of large radio controlled model aircraft, with safety paramount, and enjoyment following closely behind. Although it is a process that involves inspections and approvals, and so necessarily has an element of compliance, the intent is to run it as a collaborative effort between modelers, inspectors and the Large Model SIG Committee. The aim is more to help and guide rather than just inspect. This spirit and essence of the process follows closely the one developed by the LMA in the UK. The assistance of the LMA is gratefully acknowledged.

Legally, this Certification Process gives effect to CAA regulations and to NZMAA safety rules as follows:

Category 1: **Models 15kg – 25kg**

> Authority is delegated to NZMAA by CAA to issue Permits to Fly to owners of radio controlled model aircraft in the weight range 15kg – 25kg. It is illegal under NZ law for models of this weight to be flown without written permission from NZMAA. Certification is also required by NZMAA safety rules.

Category 2: **Models 25kg – 100kg (in law, actually 'pilotless aircraft')**

> CAA authorizes NZMAA to manage the certification process and to recommend that CAA issues written permits to owners of pilotless aircraft in the range 25kg – 100kg, to be flown for recreational use only. NZMAA has sole authority from CAA to inspect such aircraft, to make recommendations to CAA, and to issue Permits to Fly at Public Sites, relating to aircraft/pilot combinations. Certification is also required by NZMAA safety rules.

Category 3: Models less than 15kg but with IC motors 75cc or electric motors 5,000 watts input or larger

> NZMAA safety rules require that these models be certificated.

The Certification Process

This has three sequential parts, Part A, Part B, and Part C, as follows:

Part A: Registration of Project and Appointment of Inspector

The Owner of the project applies to the Large Model SIG for registration of the project, using Form A. When the Large Model SIG registers the project, it arranges for an Inspector who will then work with the Owner, and informs both

the Owner and the Inspector, with contact information. It is then the responsibility of the Owner to contact the Inspector and so proceed to Part B.

Part B: Certification of Design and Construction and Permit to Flight Test

The Inspector appointed in Part A records inspection and approvals of the aircraft design and construction, using Form B, which is signed by both the Owner and the Inspector when construction has been approved.

Approval of construction will normally require a minimum of three inspections:

- **Inspection 1:** assessment of project intentions/plans
- **Inspection 2:** assessment of construction while internal structures are accessible/visible
- **Inspection 3:** assessment of the model presented ready for flight.

At the discretion of the Inspector, or request of the Owner, further inspections may be undertaken at any stage during construction.

Standards of Design, Engineering and Construction

General: The standards of design, engineering and construction shall conform to current best practice for the chosen technology (e.g. wood-fabric, wood-wood, composites), power (e.g. glow ignition, petrol ignition, turbine, electric, glider aero-tow/winch) and whether fixed wing or rotorcraft.

The Large Model SIG will arrange for the services of specialists to advise Inspectors pertaining to new and advanced technologies, if required.

Flight Batteries : Redundant (dual) flight batteries are mandatory for Categories 1, 2, and 3. This requirement may be met by use of separate battery inputs to the receiver, or a common supply from a battery backer or a Power Box (or similar) unit.
The total battery capacity shall take into account the number and power of the servos, the required control throws, the size and speed of the model together with the expected number of commands to be exercised in flight. It is recommended that an individual battery capacity of at least 2,000 mah be utilised.

Servos : The following specifies the minimum servo torque required to power the primary control surfaces. Where servo torque is suggested for a control surface this can be provided by one or more servos working together. The minimum may not be sufficient for fast flying models or those with large control surfaces or throws. It is suggested that if the builder does not have experience with the size and class of model being built that he take into account the recommendations of the designer, best practice with models of

similar weight and performance which are published in magazines or on the internet, the experience of other modelers, and relevant information published to calculate required servo performance. The Inspector is entitled to require the builder to justify his choice of servos and may require changes.
Mechanical or other means of boosting torque supplied to a control surface may be taken into account when considering servo torque requirements on a control surface. This may be in the form a boost tabs or similar systems that assist control surface movements.
In order to reduce likelihood of control surface flutter, each servo shall be mounted with its longitudinal axis parallel to the direction of drive to the control surface. For the same reason, all aspects of the linkage to the control surface shall be free of 'slop'.

Guidelines for minimum servo torque for primary control surfaces are as follows:

Category 1
Elevators – If separate, 8kg.cm per elevator: if single elevator, 12 kg.cm.
Ailerons – 12 kg.cm each.
Rudder – 12 kg.
(Note: Inspectors of highly aerobatic models in this Category may require different servo configurations and/or larger servos)

Category 2
Elevators – two servos totaling 24 kg.cm., either one per separate surface or ganged on single surface.
Ailerons – two servos per aileron totaling 24 kg.cm.
Rudder – 24 kg.cm
(Note: Inspectors may require different servo configurations and/or larger servos for specific models in this Category, especially in the heavier range)

Category 3
Elevators – two servos totaling 18 kg.cm
Ailerons – two servos per aileron totaling 18 kg.cm
Rudder – 18 kg.cm

Heavy-duty servo connector wiring is required for models in all Categories.

Control Linkages: For all Categories the control linkages, clevises and horns shall be able to withstand the maximum torque output of the servo. When selecting the type and design of pushrods, consideration should be given to the likely forces that will be imposed on the control surfaces, to ensure that bending of pushrods and/or un-commanded deflection of control surfaces does not occur.
Heavy duty hinges are recommended for all control surfaces and careful attention given to the required number of hinges in each control surface to ensure control surface integrity in relation to the likely loads on the control surface during flight.

All hinges shall be ‘pinned’ in such a manner to prevent control surface separations. The gap between the moving control surface and the fixed surface shall be minimised.
Where pushrods / clevises are used for primary control surfaces, the minimum size shall be 4-40 (or 3mm).
Pull/pull systems are recommended where appropriate.
For large aerobatic models, specialized heavy-duty linkages, servo arms, and hinges are recommended.

Dual Receivers for Category 2: Radio installations for Category 2 aircraft (25kg-100kg) shall have dual receivers that provide redundancy for essential lateral and longitudinal controls. Common installations would have each receiver controlling one aileron and one side of the elevator but other approaches, such as dual servos for each surface controlled by separate receivers, are also feasible. Redundant flight batteries for both receivers and separate batteries for servos and receivers are encouraged, but are not mandatory. Various forms of integrated systems that provide this functionality may be approved.
Dual receivers are not required for models in Categories 1 and 3 but their use is strongly encouraged.
Radio systems that have ‘dual receivers in one package’, including some brands of 2.4GHz systems, have dual output circuits but a common signal processing unit for both output stages. Such units do not qualify as dual receivers for Category 2. (However, they are preferred to single-receiver systems for Categories 1 and 3.)
The use of fully independent dual 2.4 GHz receivers is currently infeasible so that such systems cannot meet Category 2 requirements. The LM SIG Committee recognises that technical developments may change this situation, will keep this matter under review, and will advise any consequent changes to the certification requirements.

Certificate of Design and Construction and Commencement of Flight Testing

The Categories have different processes, as follows:

Categories 1 and 3: The model is eligible to commence flight testing as soon as both the Owner and the Inspector have signed Form B, but before sending it to the Large Model SIG. Upon receiving Form B, the Large Model SIG will issue to the Owner a **Certificate of Design and Construction** and a confirmation of authorisation to Flight Test. A copy will be sent to the Inspector.

Category 2: Flight testing requires prior CAA approval in writing. The large Model SIG will arrange this as soon as it receives Form B signed by the Owner and Inspector. The **CAA permit to fly** will be sent to the Owner and Inspector by the Large Model SIG, together with a **Certificate of Design and Construction**. Flight testing may commence only after these documents have been received.

Part C: Approval of Flight Testing and Permit to Fly at Public Sites

Flight Testing must be completed within one year of the Certificate of Design and Construction being issued.

Flight Testing may take place only at a model flying site authorised by NZMAA. If this site is adjacent to a full-size airfield, testing shall not take place while full-size aircraft are active.

The personnel present at Flight Testing must be limited to the Owner, Pilot, Inspector/Witness, and essential helpers. No spectators are permitted and no other flying may take place while Flight Testing is in progress.

All other flight safety standards and rules established by NZMAA must be observed.

Witness: All flights must be witnessed by the Inspector or another person appointed by the Inspector (the 'Witness'). It is the responsibility of the Witness of each flight to ensure that all the requirements of the Flight Test Log (see below) are met, and that the flight is signed off.

Flight Test Log: Approval of Flight Testing requires completion of the Flight Test Log (Form C). The Witness of each flight should include brief notes about the performance of the model and pilot, if appropriate. By signing the Log, the Witness confirms that the model appears to be safe to fly at the place and in the weather conditions noted. The Witness should take care that this confirmation is carried out accurately and without fear or favour.

Flight Testing Requirements: These are different for the Categories as follows:

> **Categories 1 and 3**: The model will complete 5 flights with all specified manoeuvres completed on every flight. If all manoeuvres are not completed, the flight cannot be counted. The manoeuvres listed in the Flight Test Log must demonstrate the integrity and controllability of the model in the entire envelope in which it is intended to be flown.
>
> **Category 2**: The completed Flight Test Log must total a minimum of one hour flying time with all specified manoeuvres completed on every flight. If all the manoeuvres are not completed within the flight it cannot count for the Log. The flying time must be completed in not less than 6 flights and each flight must demonstrate controlled start up and shut down of all engines and the radio. It is stressed that one hour is the absolute minimum and it is likely that it will take longer than this to satisfactorily complete the test programme. Any requirements for modifications to the model that are identified during the test programme shall be carried out and this may mean further testing is required. It is expected that for unusual or complex types of model new to the pilot, the test programme will be extended.

For all Categories, the Flight Routine specified in the Log of Flights must be approved in advance by the Inspector and must include demonstration of all control functions and manoeuvres that are intended to be flown under the Permit to Test Fly. At the discretion of the Owner or Pilot, prior flights that are not eligible for the Log may be undertaken to establish control settings and flight envelope.

It is expected that the Log will be completed over a period of time and not in one day. Witnesses should ensure that the model can be operated in a variety of weather conditions and not only on a "nice" day.

Pilots: The requirements concerning pilots differ between the Categories, as follows:

> **Categories 1 and 3**: Flight testing may be undertaken by any pilot holding a Wings badge in one of the categories 'A', 'M', and 'L', and any such pilot may operate the model when it has a Permit to Fly at Public Sites.
>
> **Category 2**: The aircraft and pilot are tested and certified as a combination. Thus, a separate and new Flight Testing programme is required for each pilot that the Owner registers to fly the aircraft. The Permit to Fly at Public Sites is limited to a specified pilot, who has operated the aircraft throughout Flight Testing. A separate Permit to Fly at Public Sites is issued for the model with each pilot who qualifies the aircraft through completing a Flight Testing programme.

Permit to Fly at Public Sites: When Flight Testing has been completed, the Inspector will verify that the model remains airworthy, and will then complete and sign Form C.

Upon receiving the completed and signed Form C with attached Flight Log, the Large Model SIG will issue to the Owner a **Permit to Fly at Public Sites**, which authorises the model to be flown, subject to the 'Pilots' specification above, at any public site approved by the NZMAA, subject to the Large Model SIG reserving the right to limit the operation of Category 2 aircraft to specifically designated sites.

For Category 2, the permission obtained from CAA prior to Flight Testing remains the primary permit, to which the NZMAA Permit to Fly at Public Sites is added after completion of Flight Testing.

A Permit to Fly at Public Sites remains valid only if the Owner maintains the model in the state of airworthiness that existed at the time of the Permit being issued. Models that hold this Permit must be re-inspected when required by the Large Model SIG, which may decline to renew the Permit.

At its own discretion, the Large Model SIG may suspend or cancel a Permit on the grounds that the model (and the Pilot in the case of Category 2) no longer reaches the necessary standards. It is the responsibility of all Pilots of

Category 2 aircraft to advise the Large Model SIG of any events or occurrences that may limit their piloting capabilities.

In the event of a mishap requiring substantial repairs, the Large Model SIG may require repetition of Part B and/or Part C. It is the responsibility of the Owner to advise the Large Model SIG of any such mishaps.

Special Cases: Completed, Semi-Completed and ARF Models

If an Owner registers a project when it is already completed to apparent flight condition, semi-completed, or as an Almost Ready to Fly (ARF) kit, the above process will still be followed. Within Part B, it is likely that the Inspector will proceed directly to either Inspection 2 or Inspection 3. In cases where internal construction is not visible the Inspector will be obliged to rely on information provided by the Owner, such as plans and/or the specifications and manuals provided by ARF manufacturers. The acceptability of such evidence is at the sole discretion of the Inspector; if the information available is insufficient to make responsible judgments at Part B, construction will not be approved and no authorisation to Flight Test will be issued. The risk of such an outcome is borne entirely by the Owner. At the discretion of the Inspector, the Owner may be given the option of removing specified parts or structures so that an appropriate inspection may take place.

Under all circumstances, a model acquired by a new Owner will be required to undertake Part C.

Certification of Large Models

NZMAA Large Model SIG

Form A: Project Registration

Applicant Information
Name :
Address :

Phone :
Fax :
Email :
NZMAA Number :
Date of Application :

Official Use Only
Registration No. :
Date of Registration :
Inspector:

Project Information
Prototype Name :
Wingspan :
Length :
Anticipated Weight :
Motor(s) & Capacity :

Brief description of intended or actual design and construction methods :

Owner's Signature : .....

Send this application to the Large Model SIG at the address published in NZ Model Flier's World.

Confirmation of Registration

The project described above was registered on the date indicated, with the recorded Project Owner and Inspector. Any change of ownership or inspector requires re-registration.

Signature :

(Large Model SIG)

Note: It is the responsibility of the Owner to contact the Inspector as soon as possible after receiving this confirmation

Certification of Large Models

NZMAA Large Model SIG

Form B : Construction Inspection Checklist

(To be completed by Inspector and signed by both Inspector and Owner)

Owner's Name : Registration No.:

Address :

Phone :

Fax :

Email :

Important Note to Inspectors: The intent of the inspection process is to guide and advise, as appropriate. The process can be flexible, to meet the needs of both the Inspector and the Owner. Each aspect of the checklist must be approved, with comments added at the choice of the Inspector.

Prototype Name :

Wingspan :

Length :

Completed Weight :

Completed Wing-loading :

Motor(s) & Capacity : **Checked as Accurate** ☐

Brief Description of Construction Methods :

.....

.....

.....

.....

Materials Used Including Covering :

Approved ☐

.....

.....

Assembly Methods :

Approved ☐

.....

.....

Motor(s), Mufflers and Fuel System (or Batteries if Electric) :

Approved ☐

.....

.....

FORM B : Construction Inspection Checklist, Page 2

Receiver, Servo and Control Run Selection and Installation :

Approved ☐

.....

.....

Batteries : Type, Capacity, Installation and Back-up Systems :

Approved ☐

.....

.....

Wiring, Switches and Connections :

Approved ☐

.....

.....

Linkages, Control Horns, Hinges, Mass & Aerodynamic Balancing :

Approved ☐

.....

.....

Airframe Checks

		Approved	*Comments*
Fuselage	- torsional stiffness, stressing, transportation joints	☐	.....
Engine Mounts	- material and security	☐	.....
Wings	- spar(s), torsional stiffness, stressing, ailerons and flaps: mountings and drives, mountings to fuselage and struts/rigging	☐	.....
Tail surfaces	- torsional stiffness, fixings to fuselage, control surface hinging and drives	☐	.....
U/C Mounts	- strength and transfer of loadings to main spar/wing or fuselage structure	☐	.....

General Comments

Workmanship : .....

Strength distribution : .....

Weight distribution : .....

Radio installation : .....

Covering : .....

Wing loading : .....

Power loading : .....

FORM B : Construction Inspection Checklist, Page 3

Overall assessment of model :

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Any points of specific risk which require the Large Model SIG's attention :

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Recommendations for special operating conditions (if any) :

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Inspector's Signature : ..... **Date:**.....

Conditions of Issue

1. It must be clearly understood that this Construction Inspection Checklist is published by the Large Model SIG of NZMAA only in an endeavor to assist its members in the design, construction and flying of safe model aircraft in the designated weight ranges.
2. This document is not intended in any way whatsoever as a warranty, guarantee or assurance of the safety or freedom from defect of any part of the model or its fittings or equipment, nor of the competence of any person who may fly it.
3. The Owner specified in this document and whose signature appears below, specifically indemnifies NZMAA and the Large Model SIG, its Inspectors, Witnesses, officers and members for any liability for loss, damage or injury arising from the contents of this document whether caused by negligence or otherwise.

Owner's Signature : ..... **Date:**.....

Send this completed form to the Large Model SIG at the address published in the NZ Model Flier's World.

Certification of Large Models

NZMAA Large Model SIG

Form C: Flight Test Log

Owner :

Model :

Registration No.:

	Tick
Log of Flights (attached) inspected and approved	☐
Airframe inspected and approved after completion of Flight Testing	☐

Comments and special conditions (if any) to be attached to Permit to Fly.

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Recommended for issue of Permit to Fly at Public Sites : ☐

Inspector:

Name :.....

Signature : .....

Date :.....

Send this completed form to the Large Model SIG at the address published in the NZ Model Flier's World.

Certification of Large Models

NZMAA Large Model SIG

Log of Flights

Owner: ..... **Model:** .....

Registration Number: ……

	Flight No. : _____	**Flight No. :** _____	**Flight No. :** _____	**Flight No. :** _____	**Flight No. :** _____	**Flight No. :** _____	**Flight No. :** _____	**Flight No. :** _____
Date of Flight								
Pilot for Flight (Name)								
Site Location (Specify)								
Site & Conditions Suitable (✓)								
Pre-flight Checks Completed (✓)								
Duration of Flight (Minutes)								
Slow Speed Flight Acceptable (✓)								
Stall & Recovery Acceptable (✓)								
Flight Routine Completed (✓)								
High Speed Flight & Maneuvering Acceptable (✓)								
Witness : Name								
Signature								

Certificate of Design and Construction

Owner's Name :
Address :
NZMAA No.:
Registration No :
Date :

Prototype Name:
Wingspan :
Length :

Weight :

Engines :

This is to certify that the above model has met the requirements for Design and Construction in Category , subject to the conditions of Issue shown below, and is authorised to be Flight Tested.

Signed : ……. Date: …….
Large Model SIG, NZMAA

Conditions of Issue

1. It must be clearly understood that this Certificate of Design and Construction is not intended in any way whatsoever to be a warranty, guarantee or assurance of the safety or freedom from defect of any part of the model or its fittings or equipment, nor of the competence of any person who may fly it.
2. All members of the NZMAA or others seeking the assistance from the Large Model SIG understand that the Inspector appointed is not necessarily qualified as an Aerodynamicist an Aeronautical structural engineer or is in any other way necessarily qualified for his position and acts only on the unremunerated basis of an experienced modeler endeavoring to help a fellow modeler. Any applicant under the Approval Scheme acknowledges that he/she fully understands this statement and holds any Inspector, Witness of Flight Testing or any officer of the Large Model SIG and member of the NZMAA fully indemnified against any claim or demand whatsoever which may arise from any subsequent operation of the subject model/pilotless aircraft.
3. The Large Model SIG and NZMAA, and its Inspectors, Witnesses, officers and members, specifically exclude any liability for loss, damage or injury arising from the contents of this document whether caused by negligence or otherwise.

Certification of Large Models

NZMAA Large Model SIG

Permit to Fly

Name :
Address :
NZMAA Number :
Registration No.:
Date :

Prototype Name :
Wingspan :
Length :
Weight :
Engines :

Model 15kg – 25kg :

This is to certify that the above model has met the requirements for Design and Construction and has passed Flight Testing. It now has a Permit to Fly, within the standards and safety guidelines published by NZMAA.

Approval : .....
Large Model SIG, NZMAA

Pilotless Aircraft 25kg – 100kg :

This is to certify that the above pilotless aircraft has met the requirements for Design and Construction and has passed Flight Testing when piloted by ……. It now has a Permit to Fly when piloted by ……., within the standards and safety guidelines published by NZMAA.

Recommendation : .....
Large Model SIG, NZMAA

Approval : .....
CAA