DRYSCAN

Building and Infrared Inspections

Auckland

REPORT TYPE: Track and Trace Moisture Inspection
DATE OF INSPECTION: 22/07/2022

DRYSCAN LIMITED

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Auckland

Photo 1

REPORT PREPARED FOR:
[redacted]

REPORT PREPARED BY:
Dryscan Ltd

25/07/2022

[redacted]

Email:
Phone:

To Whom It May Concern:

DryScan Limited was engaged to complete Track and Trace Moisture Inspection Report for [redacted] at Auckland.

This report unless otherwise stated covers moisture issues within the nominated area of concern only. It has been prepared to the best of our ability and knowledge with the information made available to us at the time. It does not cover areas that were inaccessible at the time of the investigation.

This report is a guide only and identifies the presence of any thermal anomalies and any areas that may have sustained moisture damage as a result of these anomalies. A full, in depth moisture ingress inspection possibly requiring an invasive investigation may be required if major moisture ingress issues have been identified. This report does not check for structural failures and is not to be used as a road map for remedial work and whilst we have taken every care to comment on all aspects of the building, we do not make assumptions for areas of the building that cannot be sighted or are inaccessible at the time of our inspection. Some issues may also have been disguised at the time of our inspection in order to prevent their detection. DryScan Ltd was not required to check any council files related to the above property.

DryScan Ltd nor any subsidiary companies or employees of it undertake to accept any liability in the preparation of this report or the conclusion of any structural or remedial work undertaken by the owners or management.

Acceptance of this report is also acceptance of the conditions contained within.

We trust you find this report useful and that our service has met your expectations. If for any reason whatsoever you are disappointed with any facet of our service please let us know, as this is the only way we can make the necessary improvements.

Please do not hesitate to contact us if you have any queries with regard to the attached report.

Regards,

Bryce Hall
Inspector/Thermographer/Director
DryScan Limited

Auckland

SITE INFORMATION

Date of Inspection	22/07/2022 at 09:00 AM (12 GMT)
Thermographer	Bryce Hall
Property Address	Auckland
Property Description	7 Storey Apartment Building
Exterior Cladding	Concrete Tilt Slab and Alloy Panels
Roofing Material	Unknown
Joinery	Alloy

WEATHER CONDITIONS

Weather	Fine

SCOPE OF WORK

Track and Trace Building and Moisture inspection on the following areas only.

304 Study
304 Hot Water Cupboard
301 Hot Water Cupboard
201 Hot Water Cupboard
201 Study
204 Study

SUMMARY

The dwelling was built in 2019; it appears to be well constructed and in good condition with several abnormal or high moisture levels at the time of this investigation.

The main contributing factors to the increased moisture levels are:
- Shower Water Proofing Failure

Remedial Items:
- Moisture Damage

INTERNAL

304 Study

Third Floor

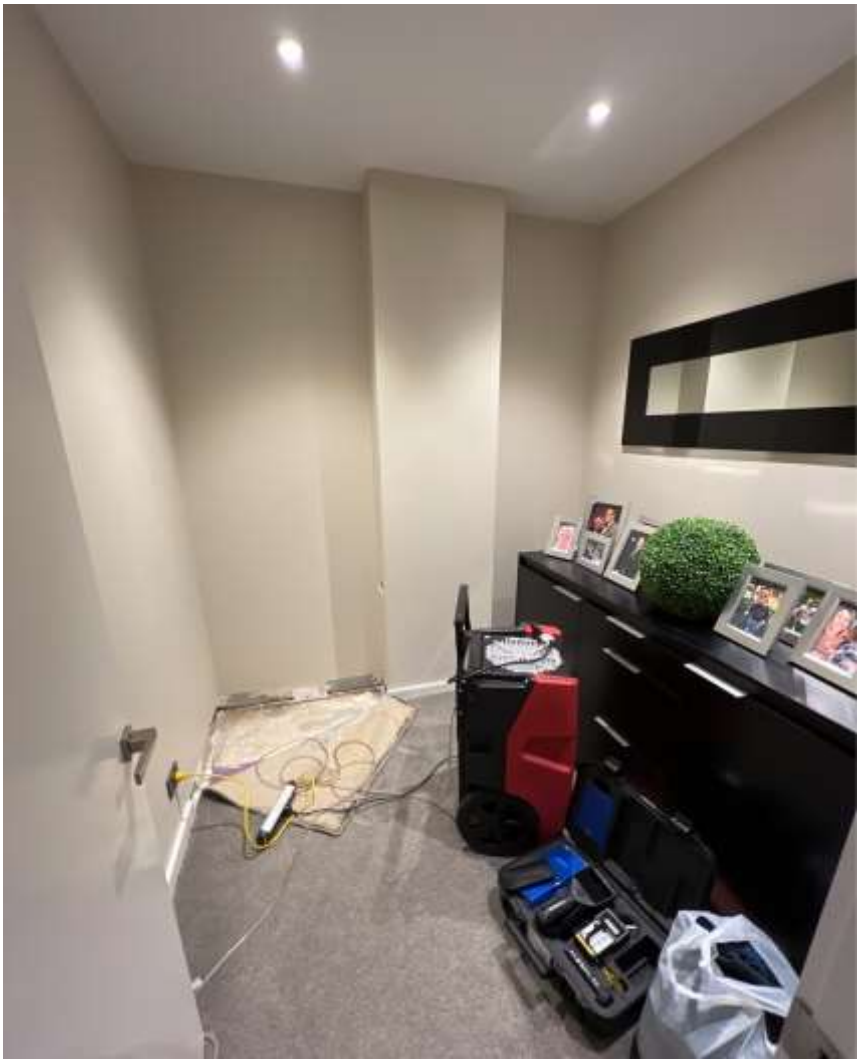


Photo 2

INFORMATION

LOCATION: Central Internal Wall

MOISTURE READING %: 08-66

THERMAL ANOMALY: Yes

PRIORITY REPAIR RATING

Soon as Possible

COMMENTS

High moisture readings were obtained due to a possible shower waterproofing failure. Due to this, moisture ingress is tracking down/through under the internal wall, giving a reading of 66% at the bottom on the left hand side with signs of seepage along the concrete floor inside the wall cavity between apartments 304 and 301 on the other side of this wall (photos and thermal images 3 to 7).

Photo 3

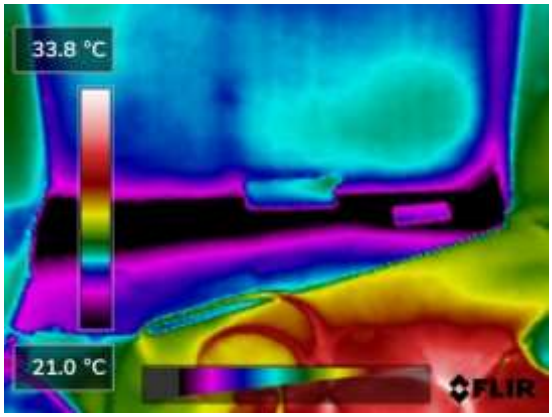


Photo 4

Photo 5

Photo 6

Photo 7

304 Hot Water Cupboard

Ground

Photo 8

INFORMATION

LOCATION: Central Internal Wall

MOISTURE READING %: 08

THERMAL ANOMALY: Yes

PRIORITY REPAIR RATING

Soon as Possible

COMMENTS

There are signs of seepage due to a possible shower waterproofing failure at the bottom on the left hand side inside the cupboard with moisture on the concrete floor coming out under the wall cavity between apartments 304 and 301 on the other side of this wall (photos and thermal images 9 to 11).

Photo 9

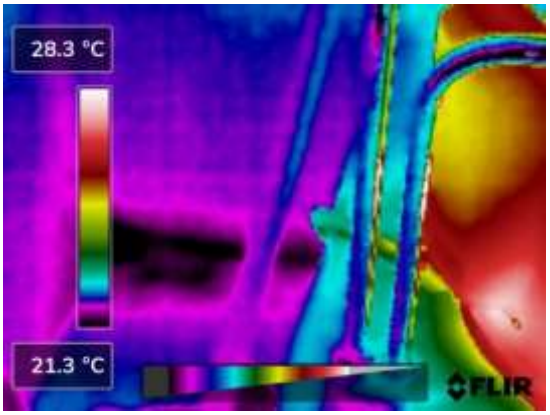


Photo 10

Photo 11

301 Hot Water Cupboard

Third Floor

Photo 12

INFORMATION

LOCATION: Central Internal Wall

MOISTURE READING %: 08

THERMAL ANOMALY: Yes

PRIORITY REPAIR RATING

Soon as Possible

COMMENTS

There are signs of seepage due to a possible shower waterproofing failure at the bottom on the right hand side inside the cupboard with moisture on the concrete floor coming out under the internal wall between the Toilet/HWC and the Bathroom/Laundry on the other side of this internal wall with a moisture at the bottom of the HWC growing large in the thermal image when a water test was carried out on the tiled shower tray (photos and thermal images 9 to 11). This issue appears to seeping under the wall between apartments this apartment 301 and to the other side of this wall that is apartment 304. Level 2 apartments below need to be checked for seepage down the building.


Photo 13

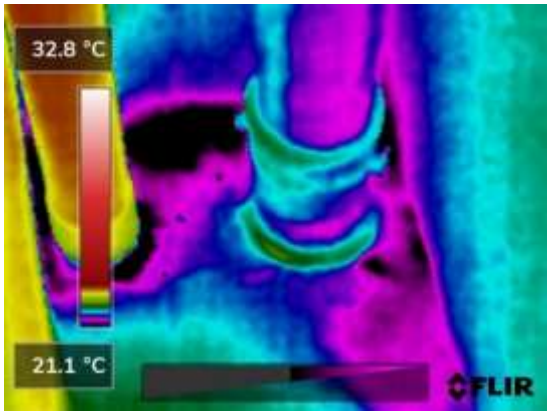


Photo 14


Photo 15

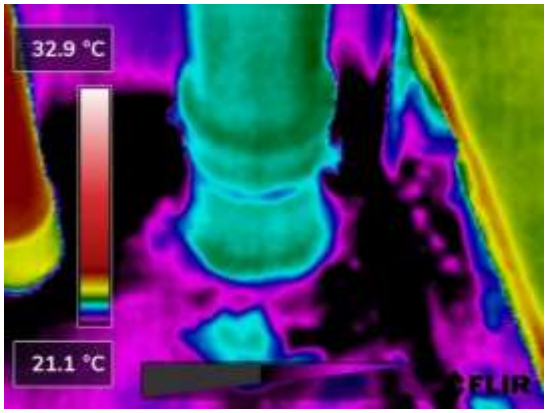


Photo 16


Photo 17


Photo 18


Photo 19


Photo 20

201 Hot Water Cupboard

Second Floor

Photo 21

INFORMATION

LOCATION: Central Internal Wall

MOISTURE READING %: 08

THERMAL ANOMALY: Yes

PRIORITY REPAIR RATING

Soon as Possible

COMMENTS

In checking level 2 below the leaks found on level 3 there was found to seepage down through the floor around pipe penetrations and cracks in the floor that can be seen at the top inside the HWC (photos and thermal images 22 to 25).

Photo 22

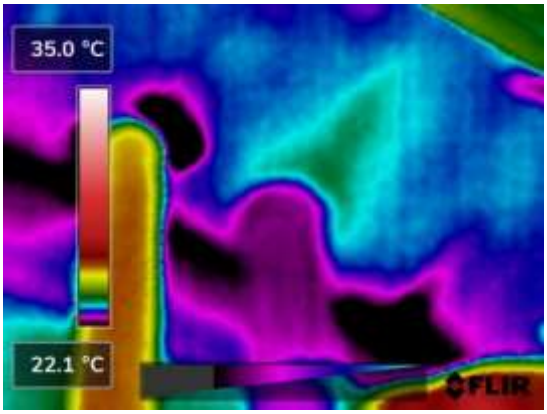


Photo 23

Photo 24

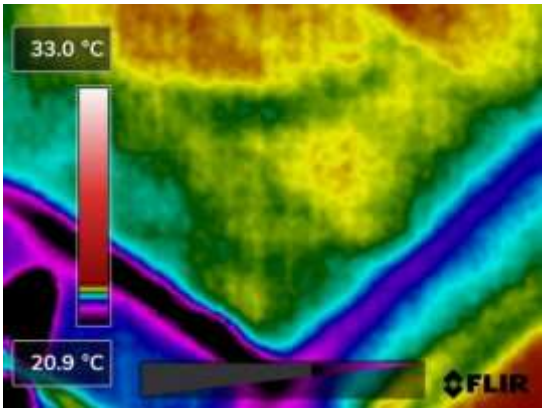


Photo 25

201 Study

Second Floor

Photo 26

INFORMATION

LOCATION: Central Internal Wall

MOISTURE READING %: 08-92

THERMAL ANOMALY: Yes

PRIORITY REPAIR RATING

Soon as Possible

COMMENTS

In checking the Study there was found to be high moisture readings on the ceiling at the top of the wall backing onto apartment 204. This also due to the waterproofing failure tracking down/through the floor/ceiling between level 2 and 3, giving a reading of 46 to 92% at the top on the left hand side (photos and thermal images 27 to 30). The other side of this wall apartment 204 needs to be checked also!

Photo 27

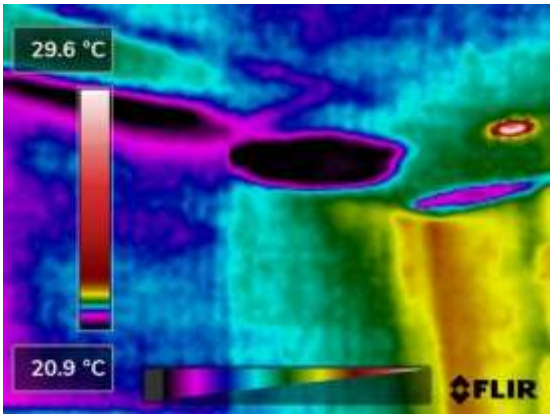


Photo 28

Photo 29

Photo 30

204 Study

Second Floor

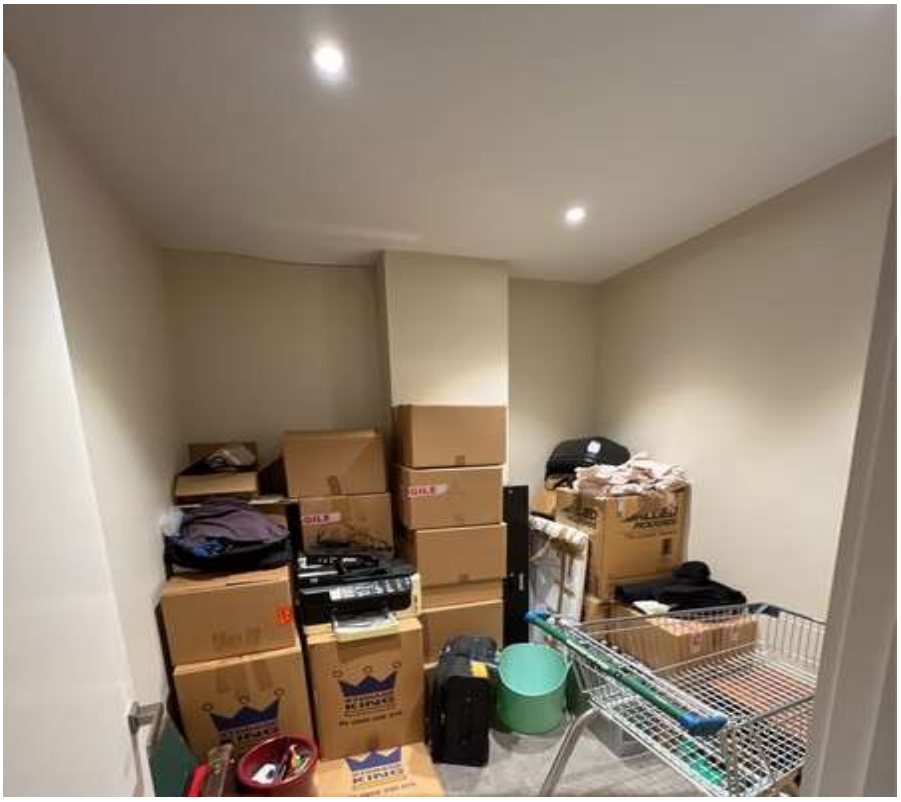


Photo 31

INFORMATION

LOCATION: Central Internal Wall

MOISTURE READING %: 08 - 90

THERMAL ANOMALY: Yes

PRIORITY REPAIR RATING

Soon as Possible

COMMENTS

High moisture readings were obtained due to waterproofing failure, located above here. Due to this, moisture ingress is tracking down/through the upper floor level to the ceiling that is badly moisture damage and sagging, giving a reading of 90% at the top on the left hand side of the column (photos and thermal images 32 to 35). This is same issue as in the Study of 201 on the other side of this wall.

Photo 32

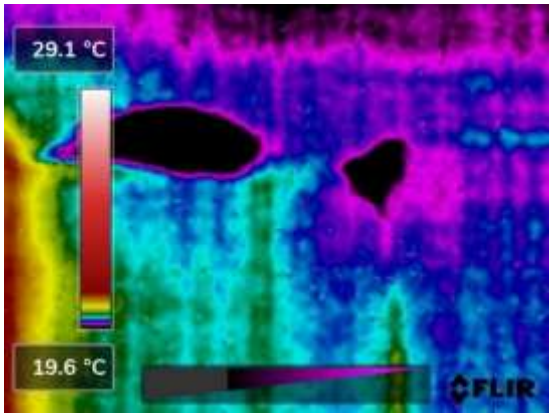


Photo 33

Photo 34

Photo 35

CONCLUSION

In conclusion, our inspection showed that this dwelling is generally well built in satisfactory condition with some concern with regard to moisture damage on levels 2 and 3 at the time of our inspection that is affecting 4 apartments that appears to due to waterproofing failure of the shower in apartment 301.

Once all the necessary remedial work has been completed we can come back to reassess the dwelling and confirm that we can see no further issues with respect to moisture ingress. There is a charge for this service.

We recommend that a regular monitoring and maintenance programme is undertaken. Most building elements will require maintenance to achieve their expected durability. The extent and nature of that maintenance will depend on the material or system, its geographical location and position within the building. The manufacturers' specifications will outline what maintenance should be undertaken.

REPORT GUIDELINES

This report is designed to inform clients of any areas of elevated moisture, thermal anomalies or other signs of moisture ingress that may lead to deterioration or failure; it is not a guarantee against failure.

Where possible we gather information by observing infrared images which help us to identify the presence of any abnormal patterns of infrared radiation otherwise known as thermal anomalies within the building envelope, which in turn may enable us or any remedial experts to identify the location of any present or future issues and to allow such remedial teams to undertake the necessary repairs and locate directly areas that may have sustained damage. A full invasive inspection may be required by the remedial teams to check for structural damage where moisture levels are excessive.

DryScan Ltd is not responsible for determining what remedial work should be undertaken and recommends that any faults are addressed by suitably qualified persons. If at the conclusion of any works DryScan Ltd is requested to re-inspect, we will require producer statements from the contractors undertaking the repairs for their work, as we cannot make assumptions on areas of the building that cannot be sighted.

DRYSCAN INSPECTION PROCESS

INTERNAL

In each room every wall and ceiling where possible including every top and bottom plate are checked using a high resolution 640 x 480 pixel image Dryscan Infrared thermal imaging camera detector and a Carroll and Carroll non-invasive moisture meter. Our technicians carry probe moisture meters that can be employed on request in areas where the non-invasive meters are getting increased readings to check the moisture levels of the framework.

EXTERNAL

An external check is also undertaken looking particularly at areas where common problems occur such as decks and balustrades, penetrations through the external cladding, flashing details and ground clearance. The outside of the dwelling, walls and roof where possible is checked for any visible defects particularly in areas where there are increased moisture levels or other thermal anomalies internally.

EFFECTS OF MOISTURE ON TIMBER

Almost all building materials deteriorate when they are exposed to moisture over time. Moisture causes fungal decay and mould in timber. Also chemicals from corroded metal fixings can cause damage to timber.

TYPES OF ROT	CONDITIONS
Dry rot	- Spore germination 28-30% moisture content - Optimum growth 30-40% moisture content - Minimum moisture content for continued growth 20% - requires high humidity and acidity for establishment
Wet rot	- Optimum growth 50-60% moisture content - Minimum moisture content for continued growth 30% - High moisture required / sensitive to drying - Tolerant to many preservatives
Soft rot	- Prefers high moisture

MOISTURE CONTENT READINGS

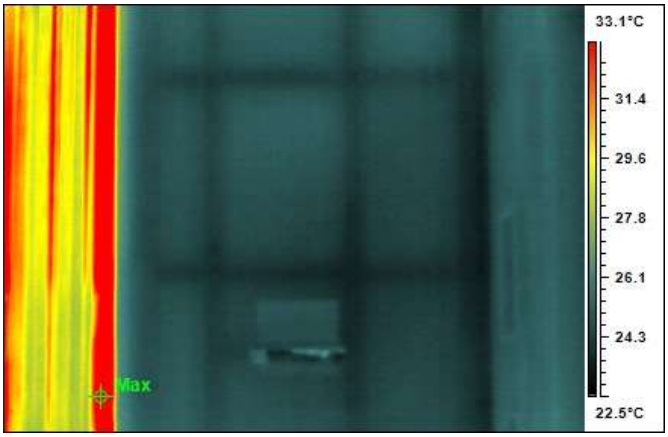
Acceptable levels of moisture are generally below 20%; anything above this level can cause damage to building elements over time and may require further investigation. The New Zealand Building Code - NZS3602 prescribes the maximum allowable moisture content level for untreated timber as 18% and for treated timber as 20%. For the purposes of this report, where moisture levels in excess of 20-30% are found, we generally recommend that a further invasive investigation is undertaken to check the structural integrity.
Unless otherwise stated moisture readings taken are non-invasive, so they are not the exact moisture readings of the framework.

MOISTURE CONTENT IN TIMBER	
<18%	Decay is highly unlikely
18-30%	Less than the fibre saturation point of 30% - decay is unusual except for dry rot
>30%	Close to wood saturation - decay is common – timber will usually require removal

INTERPRETATION OF INFRARED IMAGES

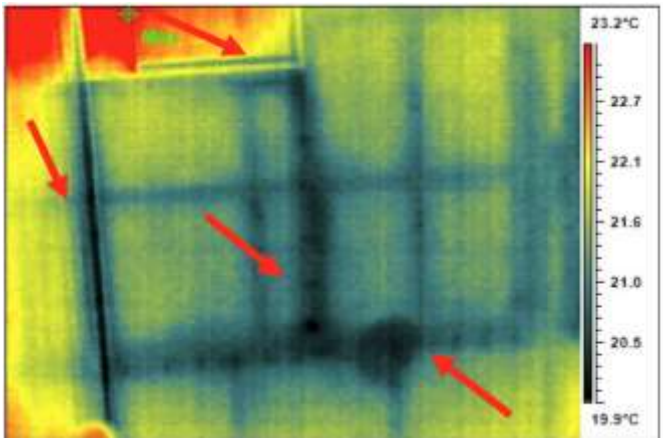
Infrared technology uses the part of the light spectrum the human eye cannot see. All objects emit infrared light/radiation and temperature has a large effect on this. The infrared cameras are sensitive to the slightest variations in infrared light / temperature and therefore have the ability to see what we and normal cameras cannot. The camera converts this infrared radiation electronically into an image that is visible to us. In effect we are seeing the temperature of the image hence the term "infrared thermography".

EXAMPLES: [These are NOT the subject property]

<table>
<tr>
<td> 
</td>
<td>This image shows the cameras ability to show internal framework.

We can see the colouring (temperature) is consistent and even throughout the wall.

This is considered a normal temperature distribution and would indicate that there are no thermal anomalies present and there is no cause for concern.

The red and yellow on the left hand side is sun on the window frame.</td>
</tr>
<tr>
<td> 

  </td>
<td>This image shows a significant difference and inconsistent distribution in colour / temperatures which would indicate the presence of a thermal anomaly and would require further investigation.

Here the internal wall framing is visible, with warmer areas being highlighted in yellow and colder areas in purple/grey.

The colder purple/grey areas in this thermal image show a window leak tracking down inside this wall and would be an area of concern and a recommendation for further investigation would be expressed.

NOTE: *The purple/grey colour is not always an indication of moisture as the colour is dependent on the ambient conditions or the colour palette used. Moisture can also be indicated by a lighter shade of colour if hot.*

This Photo shows <u>what the eye can sees</u> and clearly shows why thermal imaging is a great tool in carrying out building inspections.</td>
</tr>
</table>

INSPECTION EQUIPMENT

Dryscan Infrared Solutions thermographers use non-contact high resolution, high performance 640 x 480 pixel image infrared cameras which offer a 45% higher performance than most traditional infrared detectors. They are equipped with the highest level of thermal sensitivity currently available in an uncooled infrared camera. With the thermal sensitivity of our cameras being 0.060 degrees Celsius at 30 degrees C, this means that at 30 degrees C, the infrared camera can differentiate between temperatures that are only 0.060 degrees apart. It is this thermal sensitivity that gives Dryscan Infrared's cameras their excellent image definition and crispness and enables us to more accurately pin point a hot spot or thermal anomaly, giving clearer definition of thermal variation across the target.

Dryscan thermographers are also equipped with Carrel & Carrel non-invasive moisture meters which are used in conjunction with our infrared cameras, particularly in areas where the camera has identified the presence of a thermal anomaly. These digital meters measure how much water is present in timber and is expressed as a percentage of moisture content. Our thermographers also carry invasive probe moisture meters which involve the driving of two probes through the plasterboard or timber surface enabling the operator to collect accurate moisture content readings. This method is usually employed in areas of concern in which high moisture readings have been obtained using non-invasive methods, or when requested by the homeowner.

For the purpose of this report, all moisture readings shown are taken from the non-invasive digital meters unless otherwise specified.

POLICIES ADOPTED BY DRYSCAN LTD

1. **Purpose of Report**
   This report has been prepared for the client following an above ground infrared inspection of the building and/or its services. It provides general comments on the condition of the building and services at the time of our report.
2. **Visual Inspection**
   Whilst all care to record any irregularities or defects in the building envelope apparent, it is important to note that this is a non-structural report only. DryScan Ltd is not responsible if we are unable to access any part of the building services or property to carry out an investigation.
3. **Structural Survey**
   This report is not a structural survey. DryScan Ltd does not open up, uncover, dismantle or undertake any internal inspection of the building, services or chattels. We do not make any representation as to the soundness of the structure of the building services or chattels, or unless otherwise stated, the existence of any rot, mould, moisture, borer or other pest infestation.
4. **Title and boundaries**
   DryScan Ltd has not undertaken a search of the title to the property or a survey of the property and unless otherwise stated it is assumed that all improvements lie within the title boundaries.
5. **Compliance with statute/regulations/requisitions by territorial or other relevant authorities**
   DryScan Ltd makes no representation that the building complies with the requirements specified under the Building Act 1991, Health and Safety in Employment Act 1992, Evacuation of Building Regulations 1992 or the Disabled Persons Community Welfare Act 1975.
6. **Contamination or Hazards**
   This report is not a site or environment report and DryScan Ltd makes no representation as to the existence of any contaminant as defined in the Resource Management Act 1991 or any hazard as defined in the Health and Safety in Employment Act 1992.
7. **Chattels**
   DryScan Ltd does not check the appliances, equipment or any other chattels to see if they are operational and makes no representation as to the condition, quality or efficiency of any such appliance, equipment or other chattels. DryScan Ltd does not check the operational efficiency of electrical equipment, dishwashers, swimming pools or burglar systems.
8. **Publication**
   Neither the whole nor any part of this infrared report or any reference to it may be included in any published document, circular or statement without first obtaining the written approval of DryScan Ltd.
9. **Responsibility**
   DryScan Ltd responsibility in connection with this report is limited to the client to whom it is addressed and is limited in liability to the full cost of the report. Acceptance of this report is deemed to be acceptance of these enclosed conditions.
10. **General**
    Nothing contained in this statement of policies, shall be deemed to exclude or restrict any rights or remedies the client may have under the Fair Trading Act 1986 or the Consumer Guarantees Act 1983. If any provision in this statement of policies is illegal, invalid or unenforceable, the validity and enforceability of the remaining provisions will not be affected.
11. **Further Imaging**
    DryScan Ltd will undertake further imaging, or if requested a more detailed report at a quoted cost or we can refer you to other competent persons to undertake further structural investigations.
12. **Term of the Infrared Report**
    This report has been prepared on the basis of thermal imaging carried out on the date of the investigation. As building materials can deteriorate over time and weather conditions affect moisture levels, it is valid for the date of the inspection.
13. **Rotting, leaking homes**
    This report is a visual/thermal/infrared imaging report. It shows inconsistencies with temperature distribution within the inspected area/s. Invasive techniques are required to ascertain conclusive evidence of the type/s of mould and/or percentage of moisture in any areas of concern.
14. **Disclaimer**
    This report shall only be used as a reference to show that there are irregularities within the building. Further investigations carried out at the discretionary right of the person/s that authorized this report. DryScan Ltd makes no claim to there being moisture or mould within the structure as to verify this requires an invasive inspection by a qualified inspector within NZ.
15. **Liability Insurance**
    DryScan Ltd is covered by Professional Indemnity and Public Liability Insurance.