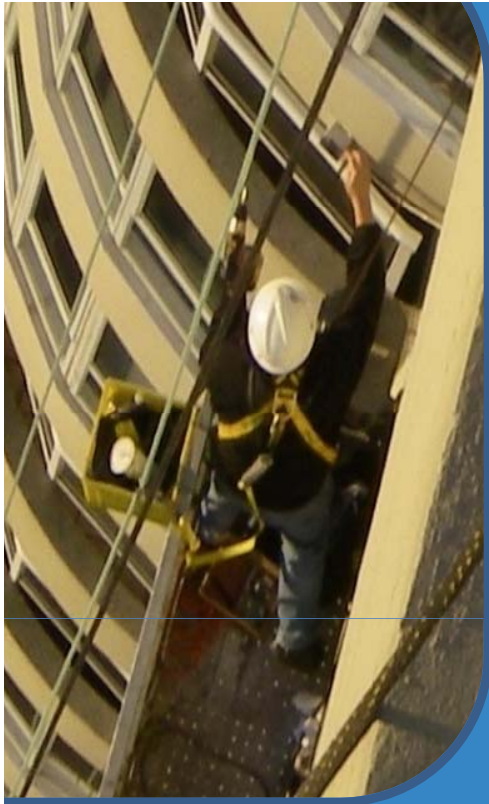




BUILDING INTELLIGENCE

Jason Teetaert, P.Eng

V.P. Business Development

www.smtresearch.ca



**DISCLAIMER:
THE FOLLOWING PRESENTATION MAY
CONTAIN PHOTOS YOU MIGHT RECOGNIZE:**

**IF THE CASE EXAMPLES AND PHOTOS IN THIS
PRESENTATION MAKE THE CONSULTANT
LOOK GOOD – THEY ARE YOUR PROJECT!**

**IF THEY LOOK BAD – THEY ARE YOUR
COMPETITOR'S PROJECT**

Sensor



- Moisture - Pressure
- Temperature - RH
- Project Specific Sensors

Acquisition



Wireless or Wired Data
Acquisition & Gateway

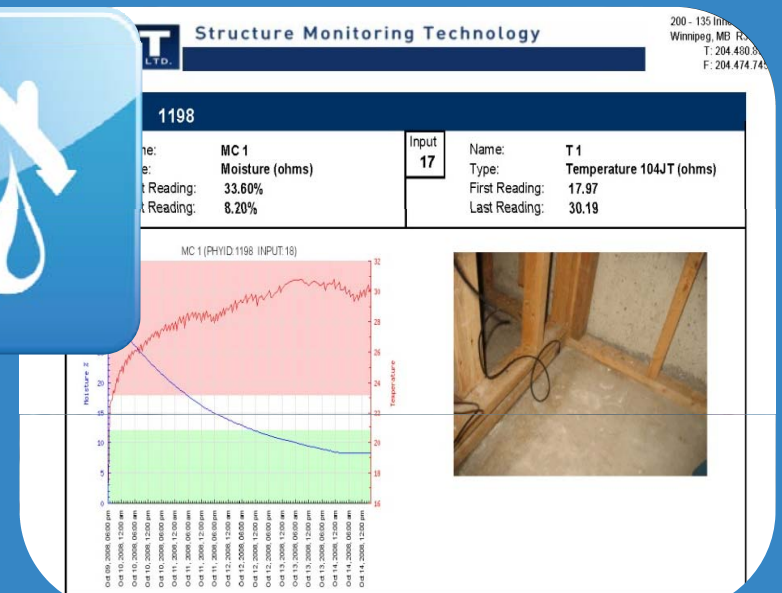
Real time Monitoring



Monitoring Centre



BUILDING INTELLIGENCE





STRUCTURE HEALTH

**WHY MONITOR THE BUILDING
STRUCTURE?**

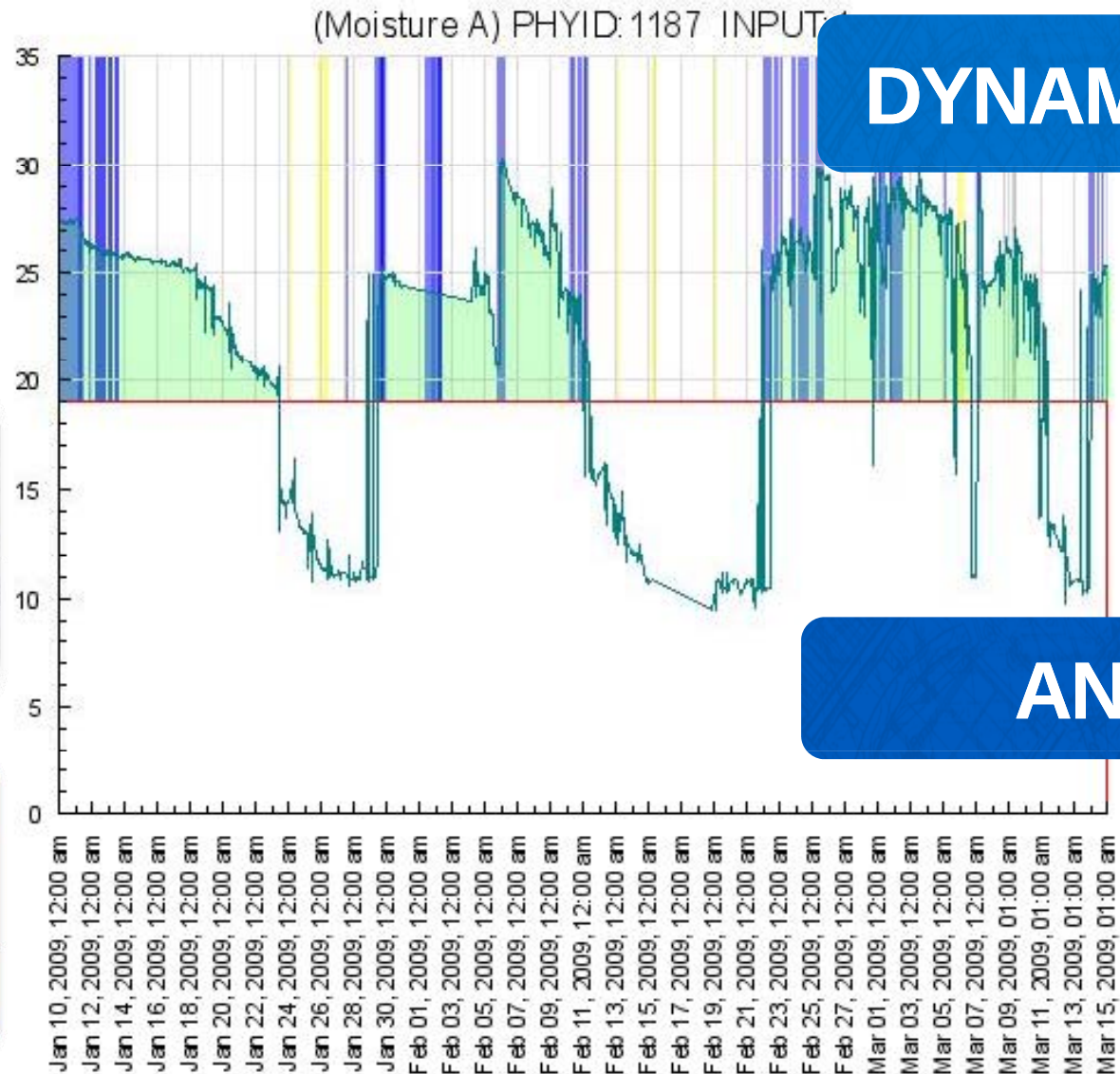


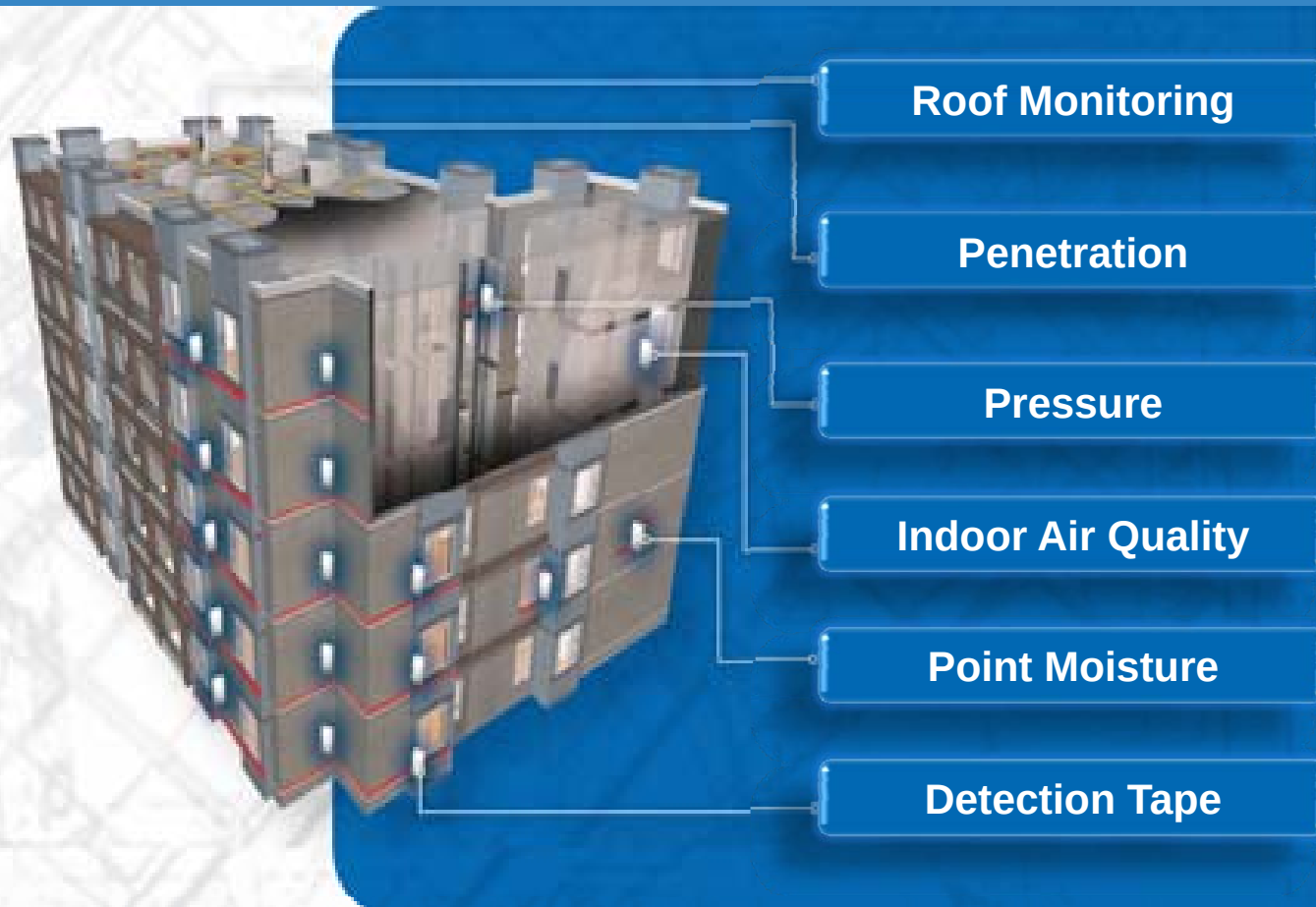


STRUCTURE HEALTH

DYNAMIC DATA

ANALYTICS

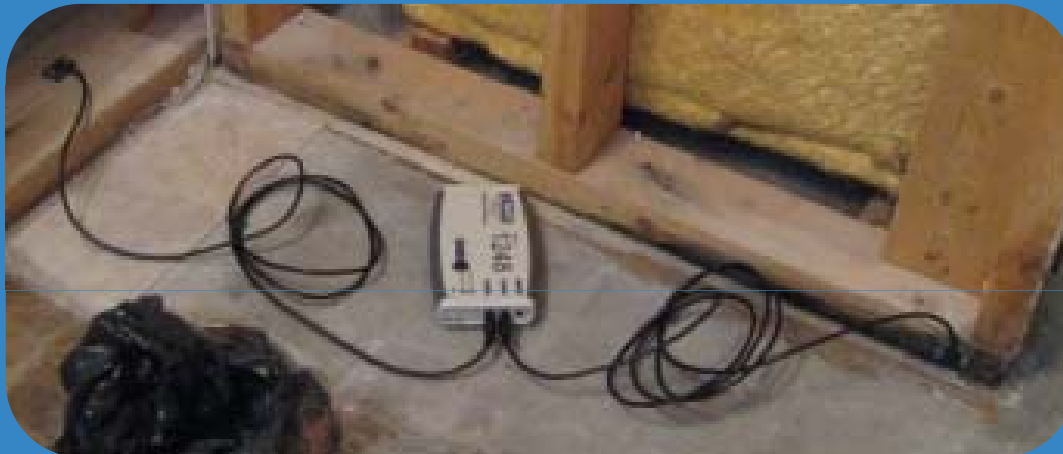
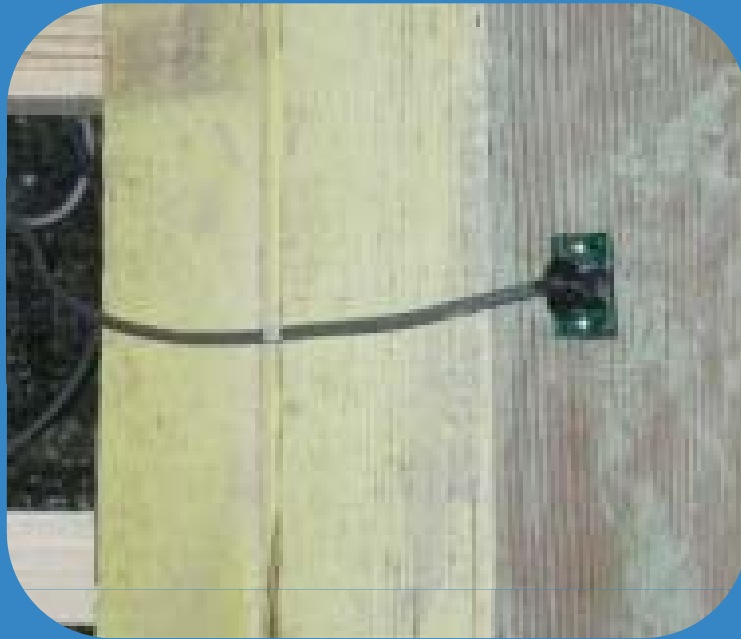






SENSOR MOISTURE

POINT



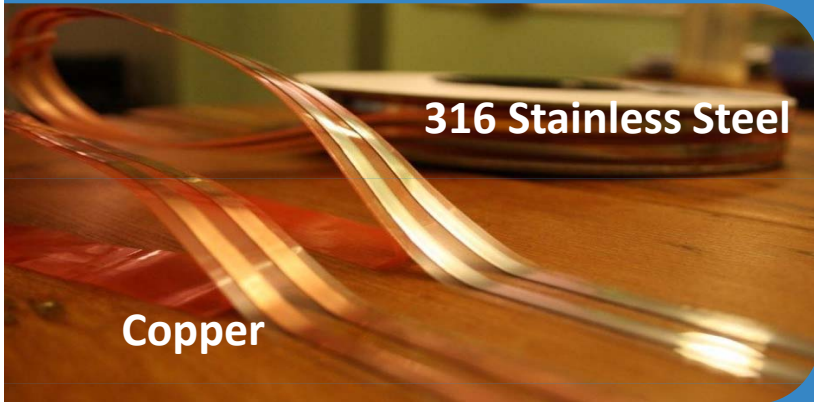
- - RESEARCH GRADE
- INTEGRATED TEMPERATURE
- MOISTURE CONTENT & LEVEL
WOOD, GYPSUM,
INSULATION,
CONCRETE,
MASONRY



SENSOR MOISTURE

LINEAR MOISTURE

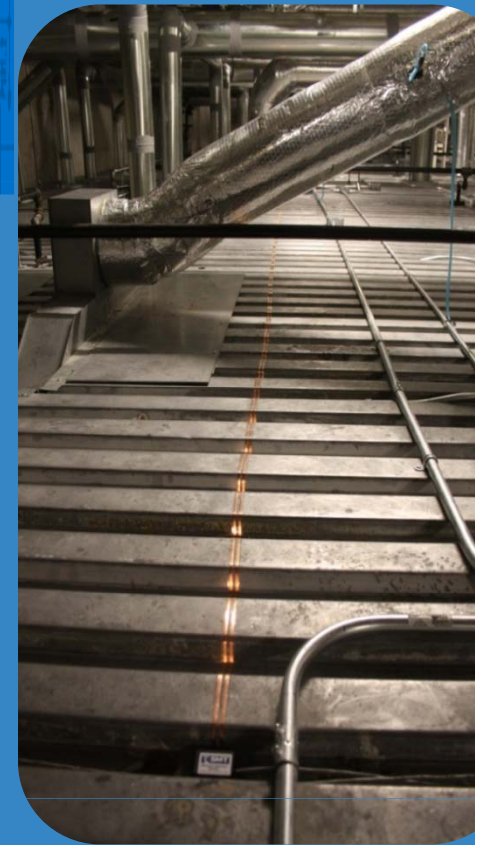
- PRESENCE OF MOISTURE
- WIDE COVERAGE AREA
- LIMITED ACCURACY



WALL



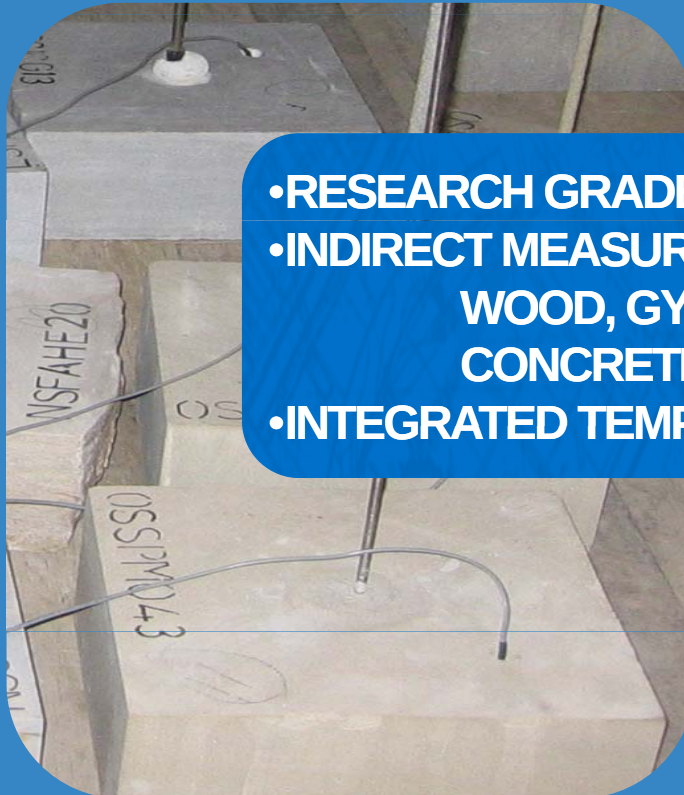
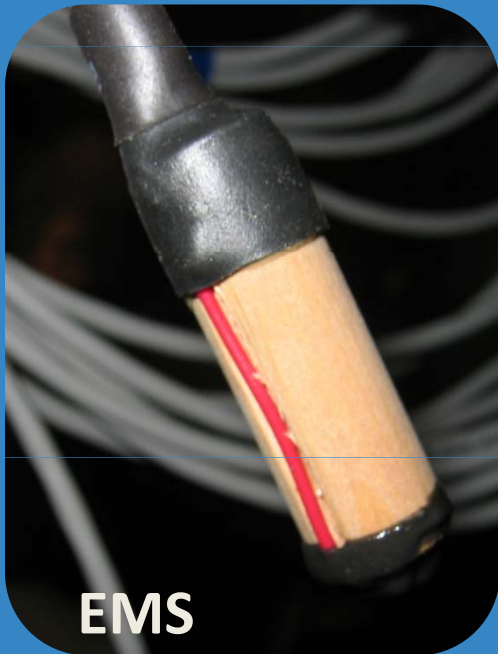
ROOF



FLOOD



SENSOR MOISTURE EMBEDDED (EMS)



- RESEARCH GRADE, CALIBRATED
- INDIRECT MEASUREMENT OF MOISTURE IN:
WOOD, GYPSUM, INSULATION,
CONCRETE, MASONRY
- INTEGRATED TEMPERATURE





SENSOR DISPLACEMENT



- CUSTOM MOUNTING OPTIONS
- VARIOUS RANGES AND RESOLUTION



SENSOR WEATHER ENVIRONMENT



- WIND SPEED
- WIND DIRECTION
- TEMPERATURE
- RELATIVE HUMIDITY
- ULTRA VIOLET RADIATION
- SOLAR RADIATION
- PRECIPITATION
- TIMED PHOTOGRAPHS
- PAN-TILT-ZOOM CAMERA



SENSOR PRESSURE

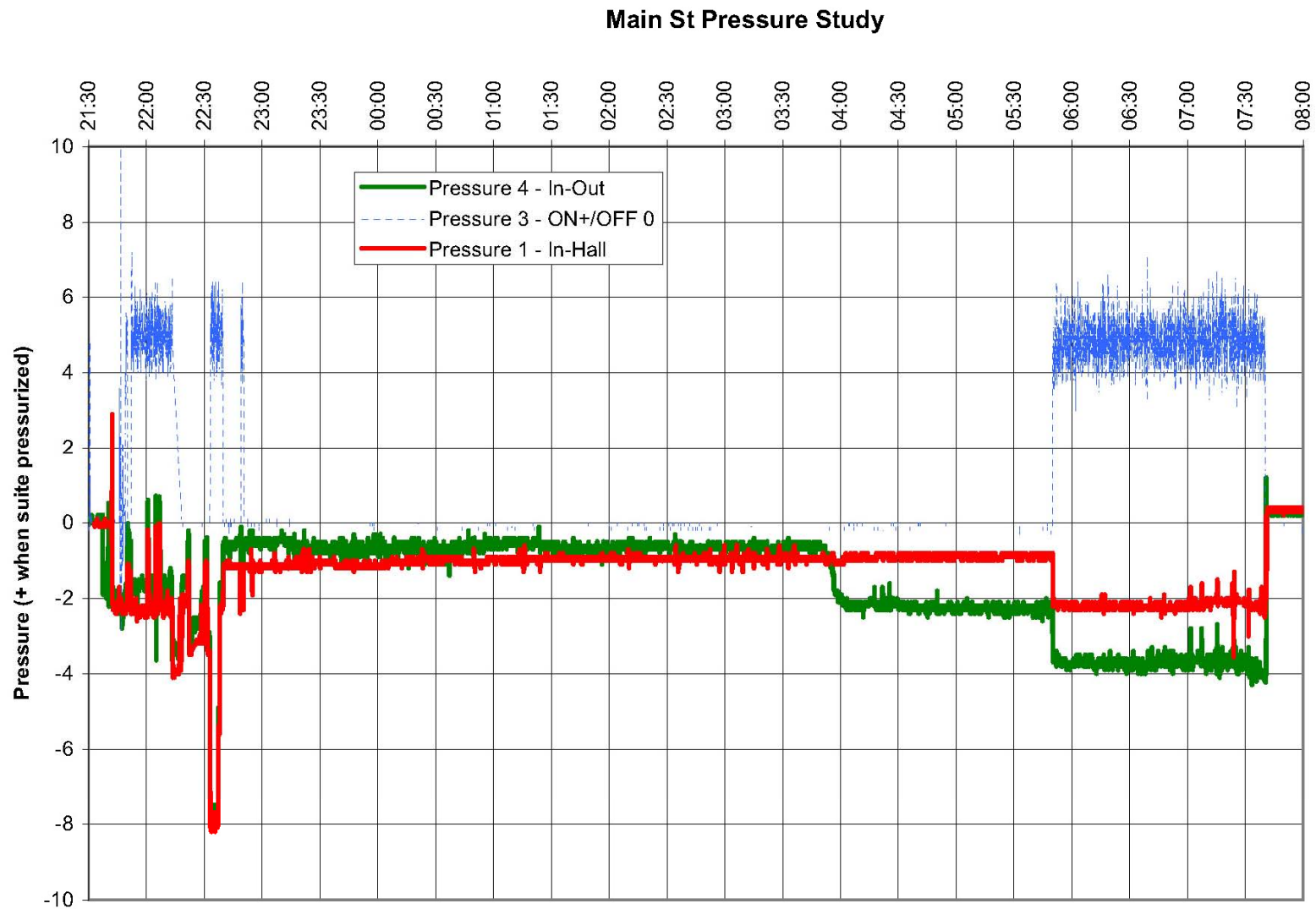
DIFFERENTIAL



- DIFFERENTIAL WALL PRESSURE
- PITOT TUBE TO INTERIOR SPACE
- RANGE +/- 250 PASCAL



SENSOR PRESSURE



PLATFORM



- BATTERY – LONG LIFE
- BATTERY – RECHARGEABLE
- PERMANENT WIRED POWER
- SOLAR POWER WITH STORAGE

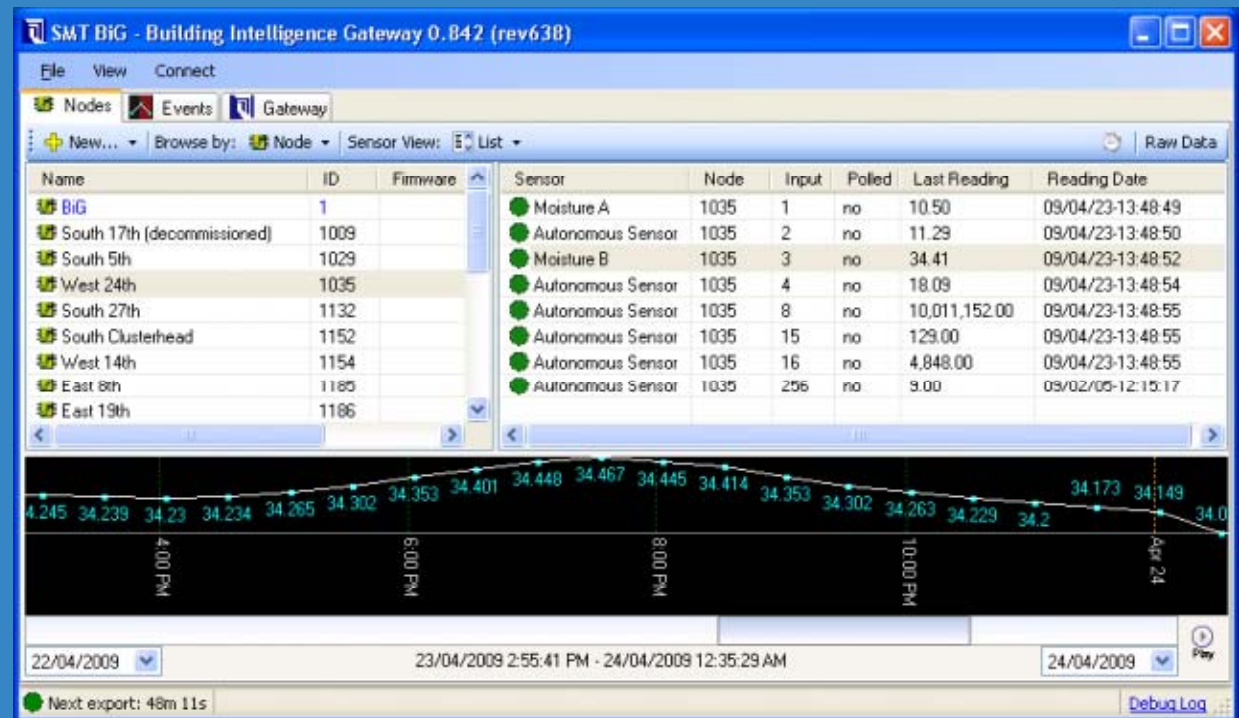
- WIRELESS: 2.4GHZ 802.15.4
- WIRED: CAN 2.0B
- INPUTS: 8X RESISTANCE
- INPUTS: 2X VOLTAGE
- ANTENNA: 30m – 400m OPT





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GATEWAY



REAL TIME DATA



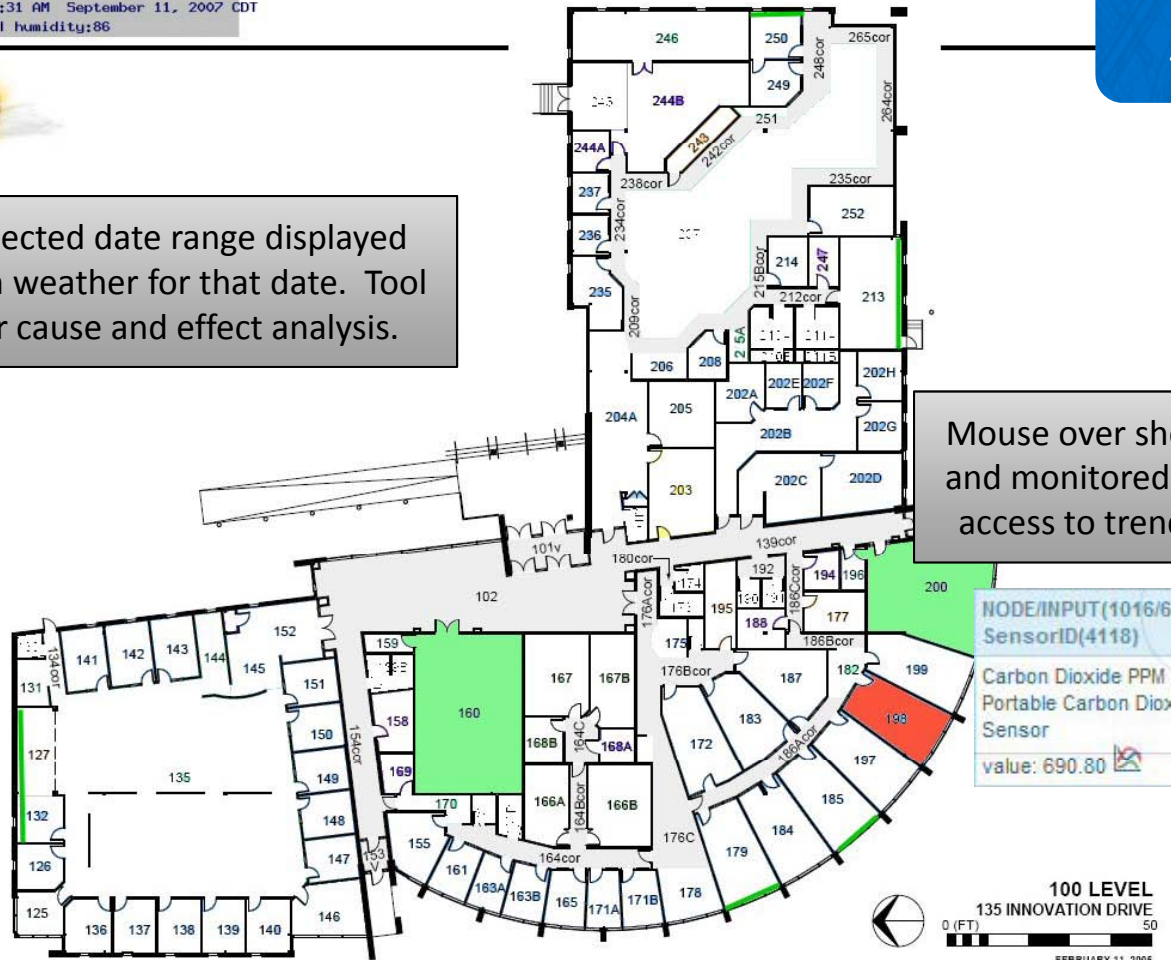
BUILDING INTELLIGENCE

ANALYTICS

Time: 09:31:31 AM September 11, 2007 CDT
13C | 8kph | humidity:86



Selected date range displayed with weather for that date. Tool for cause and effect analysis.



Mouse over shows sensor detail and monitored value with direct access to trend analysis graph.

NODE/INPUT(1016/6) -
SensorID(4118)
Carbon Dioxide PPM
Portable Carbon Dioxide
Sensor
value: 690.80

The report is live – and dynamic – just like your building.

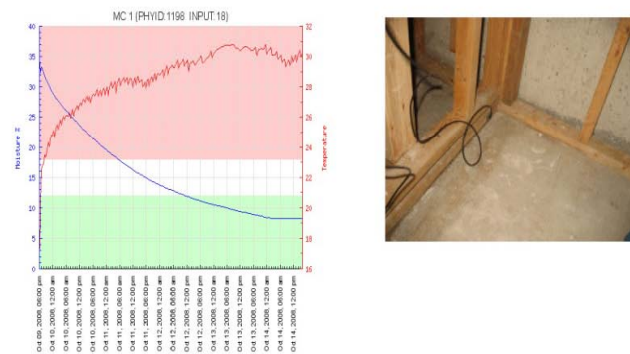


Structure Monitoring Technology

200 - 135 Innovation Dr.
Winnipeg, MB R3T 6A8
T: 204.480.8579
F: 204.474.7453

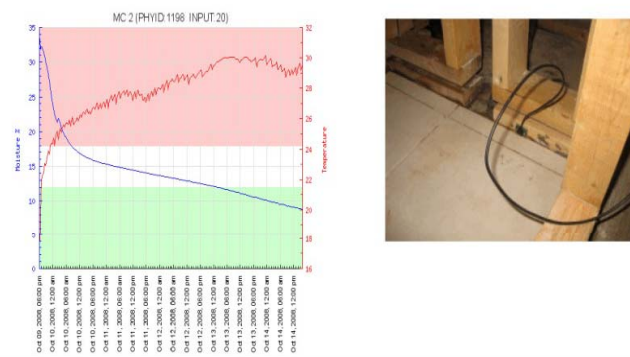
WIDAQ: 1198

Input 18	Name: MC 1 Type: Moisture (ohms) First Reading: 33.60% Last Reading: 8.20%	Input 17	Name: T 1 Type: Temperature 104JT (ohms) First Reading: 17.97 Last Reading: 30.19
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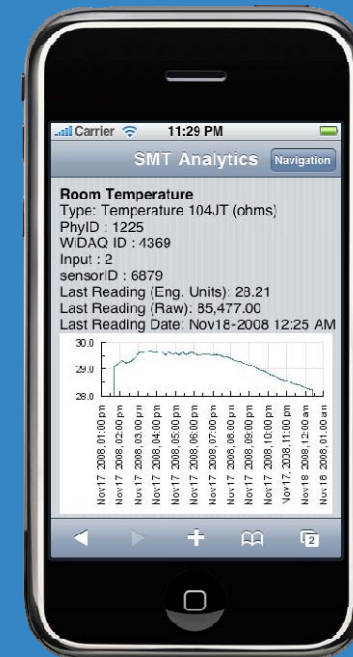


WIDAQ: 1198

Input 20	Name: MC 2 Type: Moisture (ohms) First Reading: 32.99% Last Reading: 8.91%	Input 19	Name: T 2 Type: Temperature 104JT (ohms) First Reading: 18.23 Last Reading: 29.43
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ANALYTICS





BUILDING INTELLIGENCE



TECHNOLOGY KITS

TURN-KEY



LIFE CYCLE



NEW CONST EXISTING BUILDI END OF LIFE

QUALITY ASSESSMENT ENERGY SAVING TASK
SITE CONDITION EVALUATION EXTENSIVE UPGRADE
COMMISSIONING MAINTENANCE SEND TO GRAVE?
WARRANTY EXTEND SERVICE LIFE

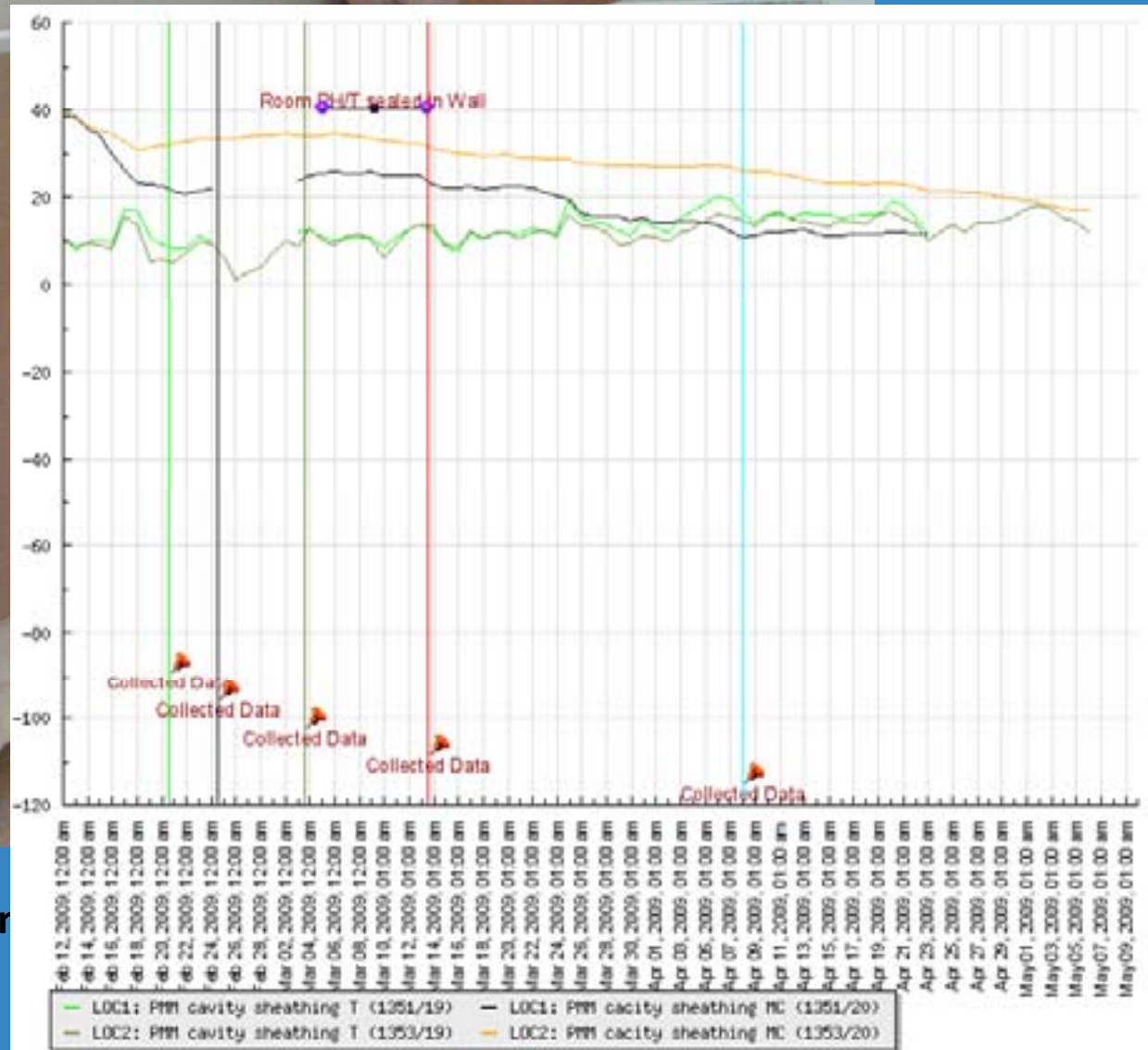


LIFE CYCLE



NEW CONSTRUCTION





Reference: ICBEST 2010 Paper:
The Implications of Drying Gypsum
Plaster in Walls with Vapour
Retardant Paint



LIFE CYCLE





BUILDING INTELLIGENCE

SOLUTIONS

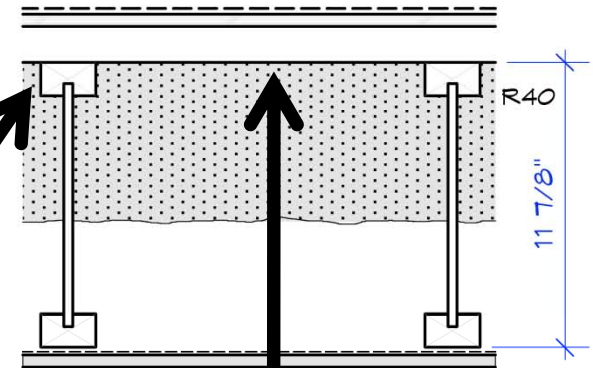


INVESTIGATION



2 LAYERS 20-mil LIQUID APPLIED WATERPROOF
MEMBRANE (ECOLINE-R OR EQUIVALENT)
3/4" EXTERIOR GRADE T&G PLYWOOD SHEATHING
(SLOPE TO DRAIN AS PER PLAN)
2X4 STRAPPING
11-7/8" TJI (REFER TO STRUCTURAL DRAWINGS)
6.67" POLYURETHANE SPRAY FOAM INSULATION (R40)
1/2" G.N.B.

TOTAL ASSEMBLY INSULATION VALUE: R40



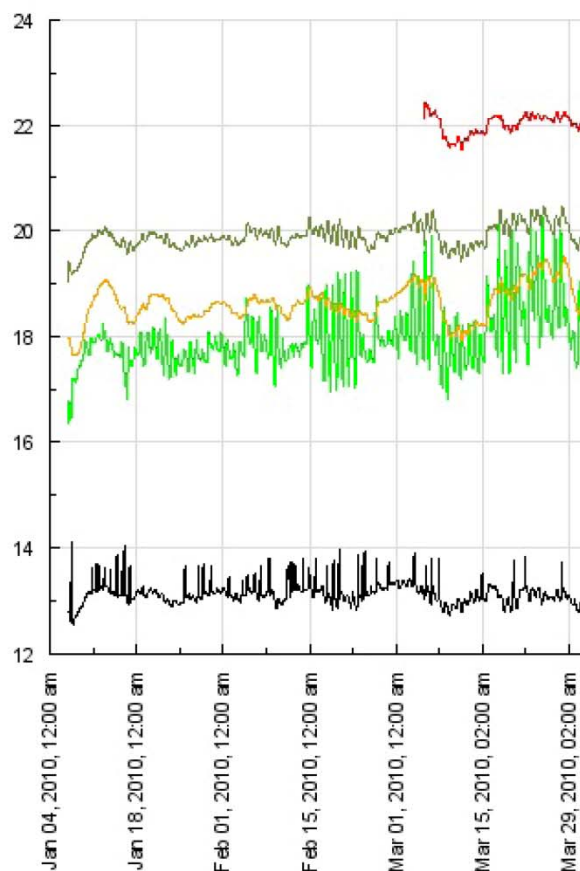
ROOF INVESTIGATION





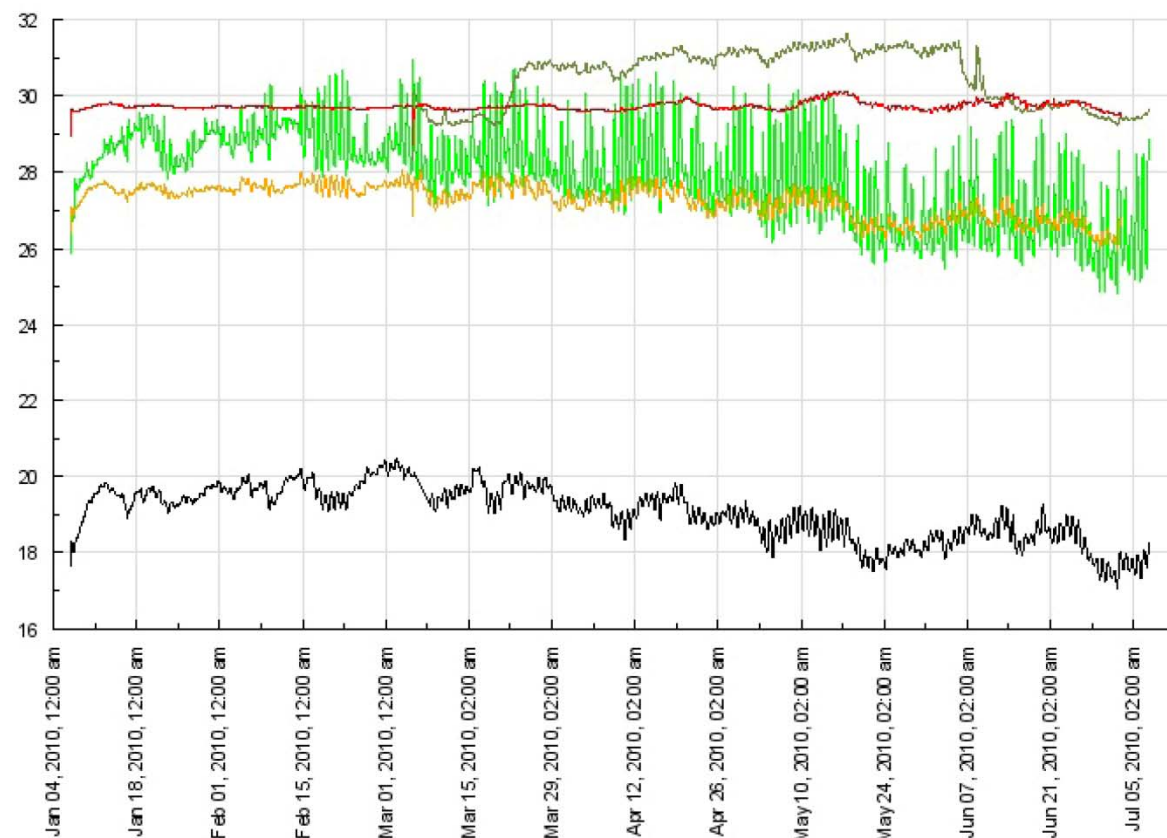
ROOF INVESTIGATION

Group :: Truss Moisture Content



— Kitchen Truss - MC - High Level (1416/19) — Dining
— Living Rm South Truss - MC (1461/19) — Living
— Kitchen Low Truss - MC (1464/19)

Group :: Sheathing Moisture Content



— Kitchen Sheathing - MC - High Level (1416/17) — Dining Sheathing - MC - vented (1416/21)
— Kitchen Low Sheathing - MC (1464/17) — Living Rm South Sheathing - MC (1461/17)
— Living Rm North Sheathing - MC (1461/21)



LIFE CYCLE



EXISTING BUILDING





BUILDING INTELLIGENCE

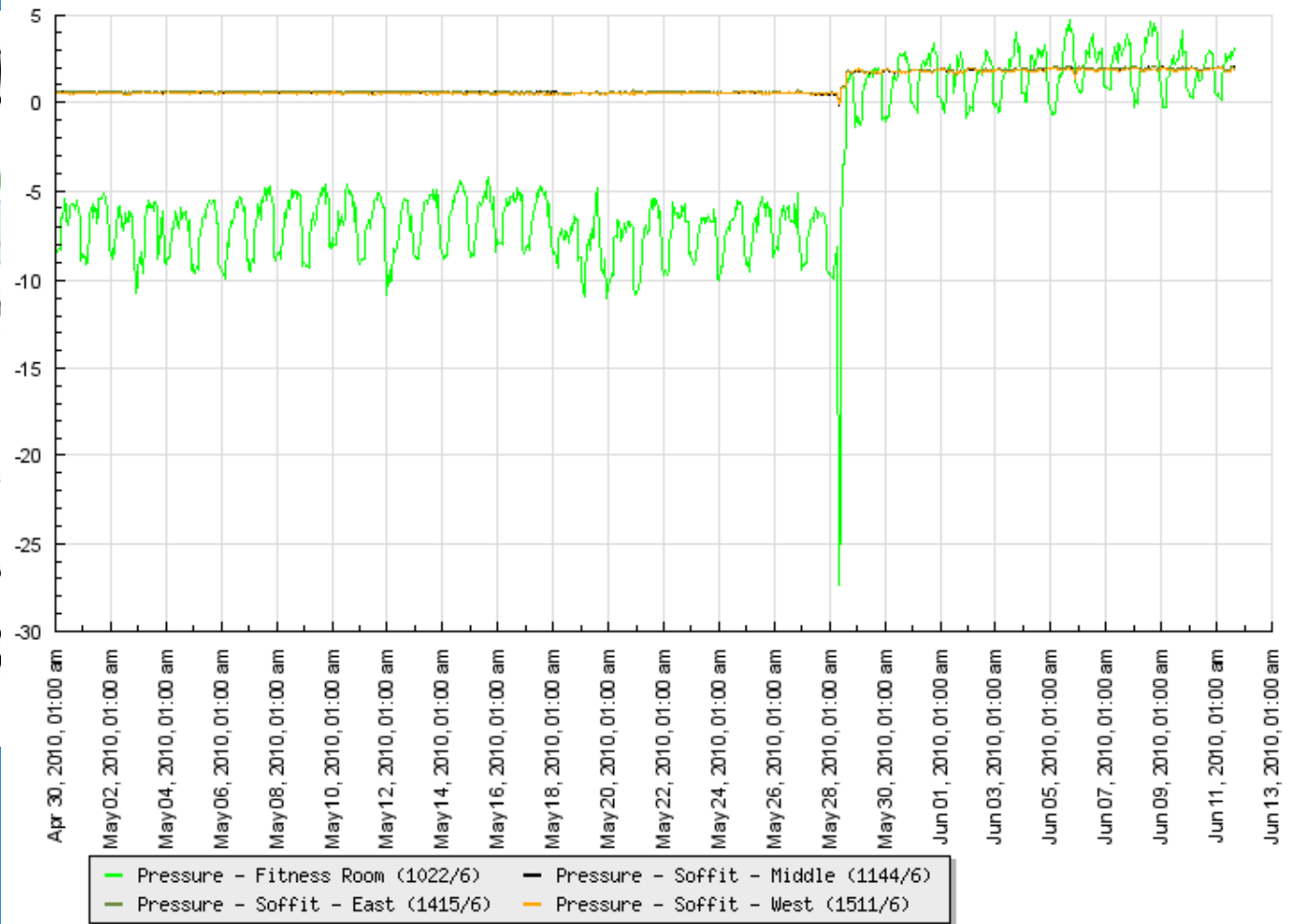
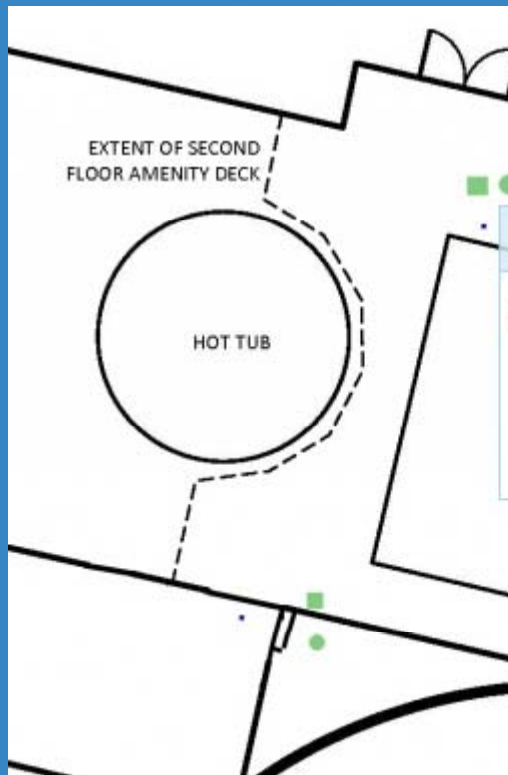
INVESTIGATIONS





BUILDING INTELLIGENCE

INVESTIGATIONS





BUILDING INTELLIGENCE

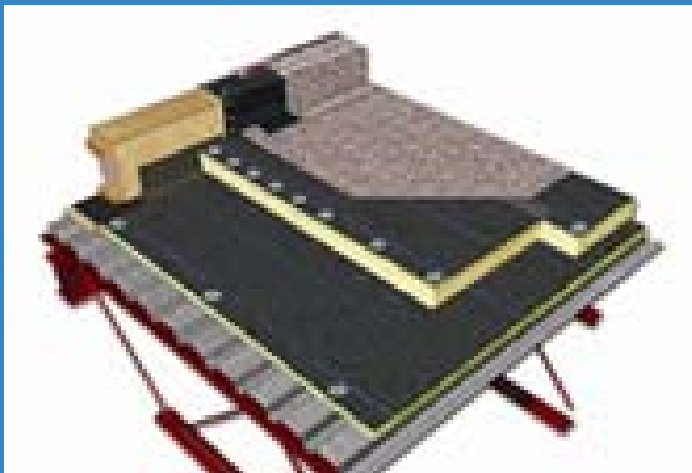
INVESTIGATIONS



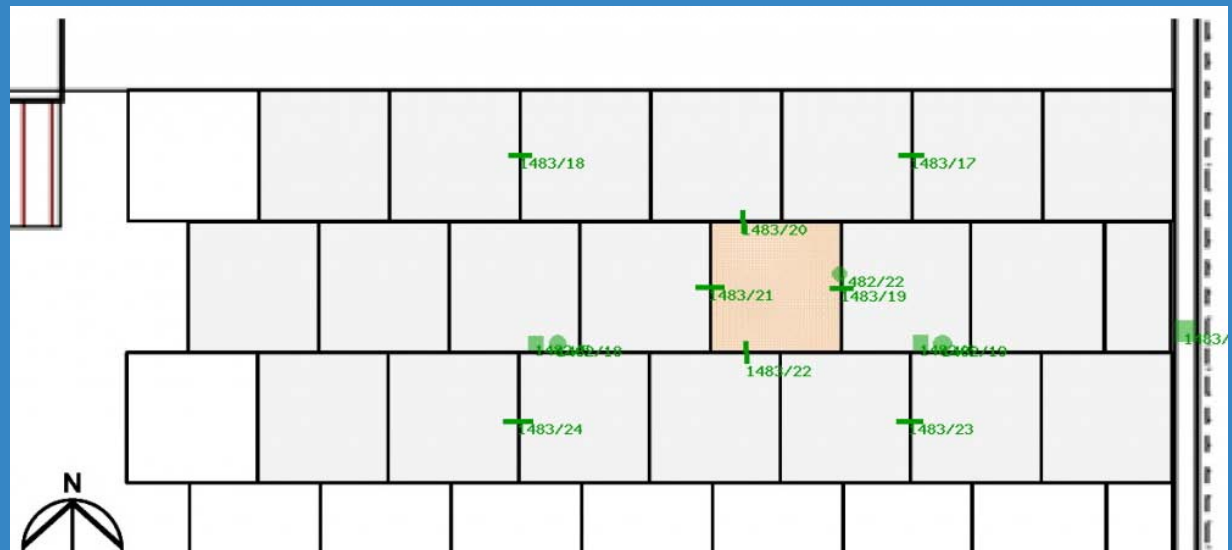
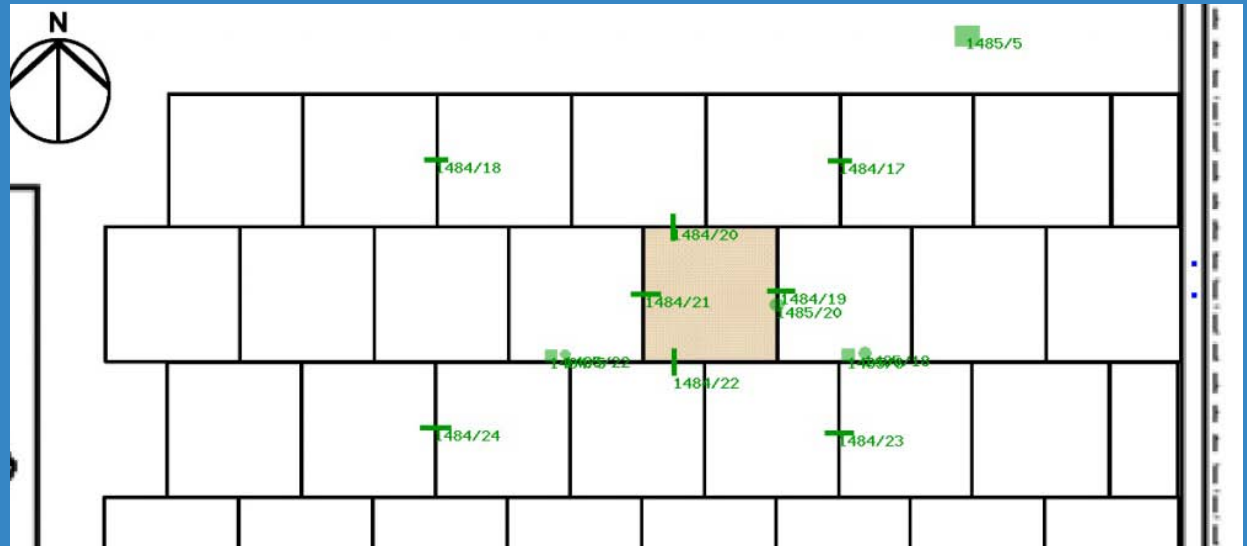
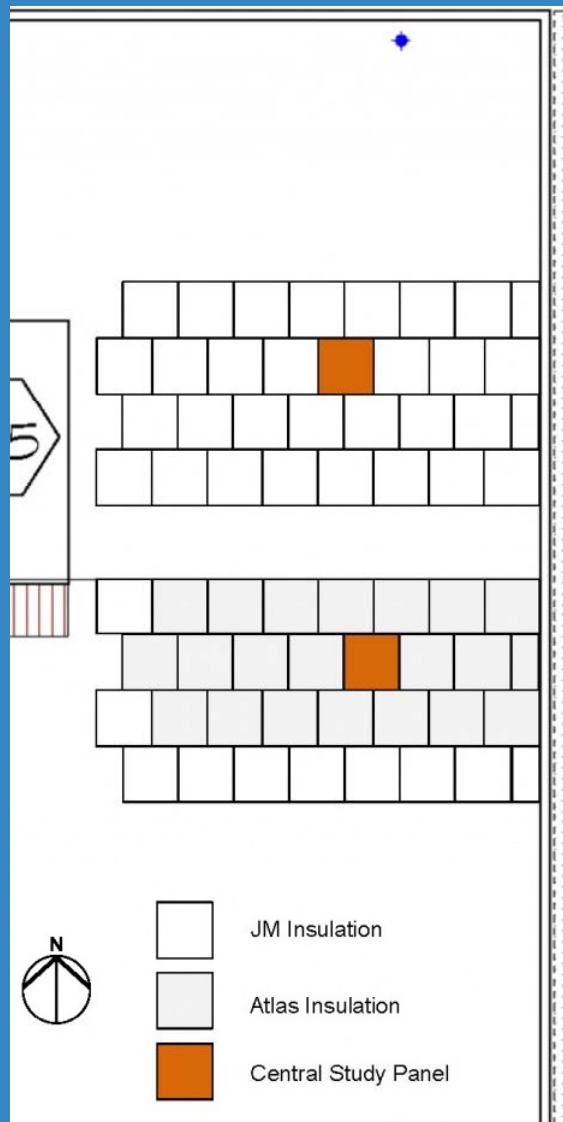


SMT

ROOF INVESTIGATION



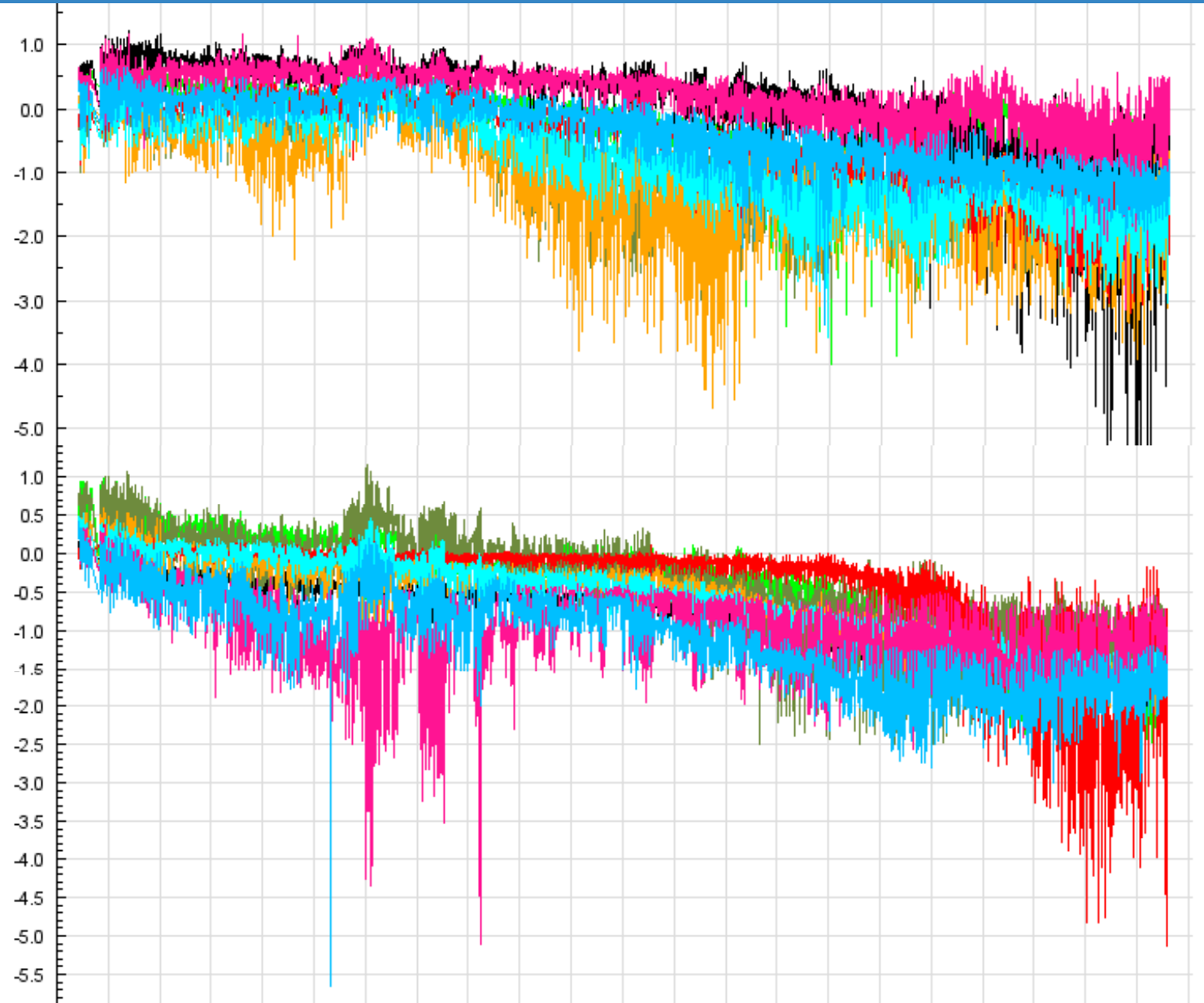
**MEASURE CONDITIONS LEADING
TO DIMENSIONAL CHANGE IN
POLYISO ROOF INSULATION**





SMT

ROOF INVESTIGATION





WALL INVESTIGATION



Sheathing within exterior bathroom walls were previously deteriorated from air exfiltration.

Sheathing replaced as part of a larger full enclosure rehabilitation. Bathrooms all fully rehabilitated.





SMT

WALL INVESTIGATION





SMT

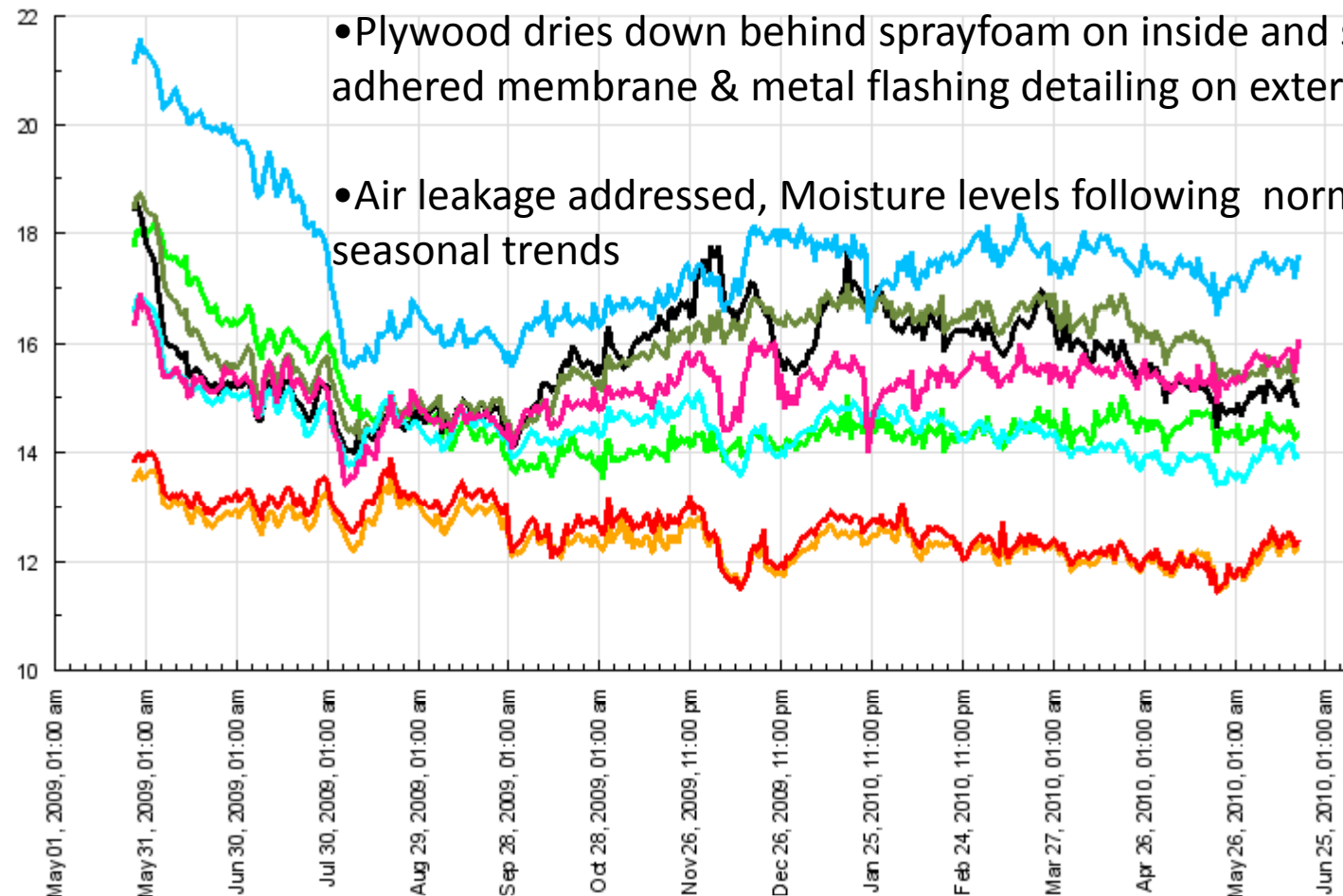
WALL INVESTIGATION





SMT

WALL INVESTIGATION



305 MC 1 - SPUF left dryer duct (1440/17)	305 MC 2 - SPUF center kit duct (1440/19)
305 MC 3 - SPUF bath duct (1440/21)	201 MC 1 - SPUF bath duct (1441/17)
201 MC 2 - SPUF kitchen duct (1441/19)	201 MC 3 - left (1441/21)
101 MC 1 - left bath duct (1442/17)	101 MC 3 - SPUF right dryer duct (1442/21)



- Air leakage from suites leaking into exterior walkways of a wood frame building caused widespread damage
- Rehabilitation to repair wood framing and air-seal joist spaces from interior
- North facing walkway – low drying potential if leaks do occur



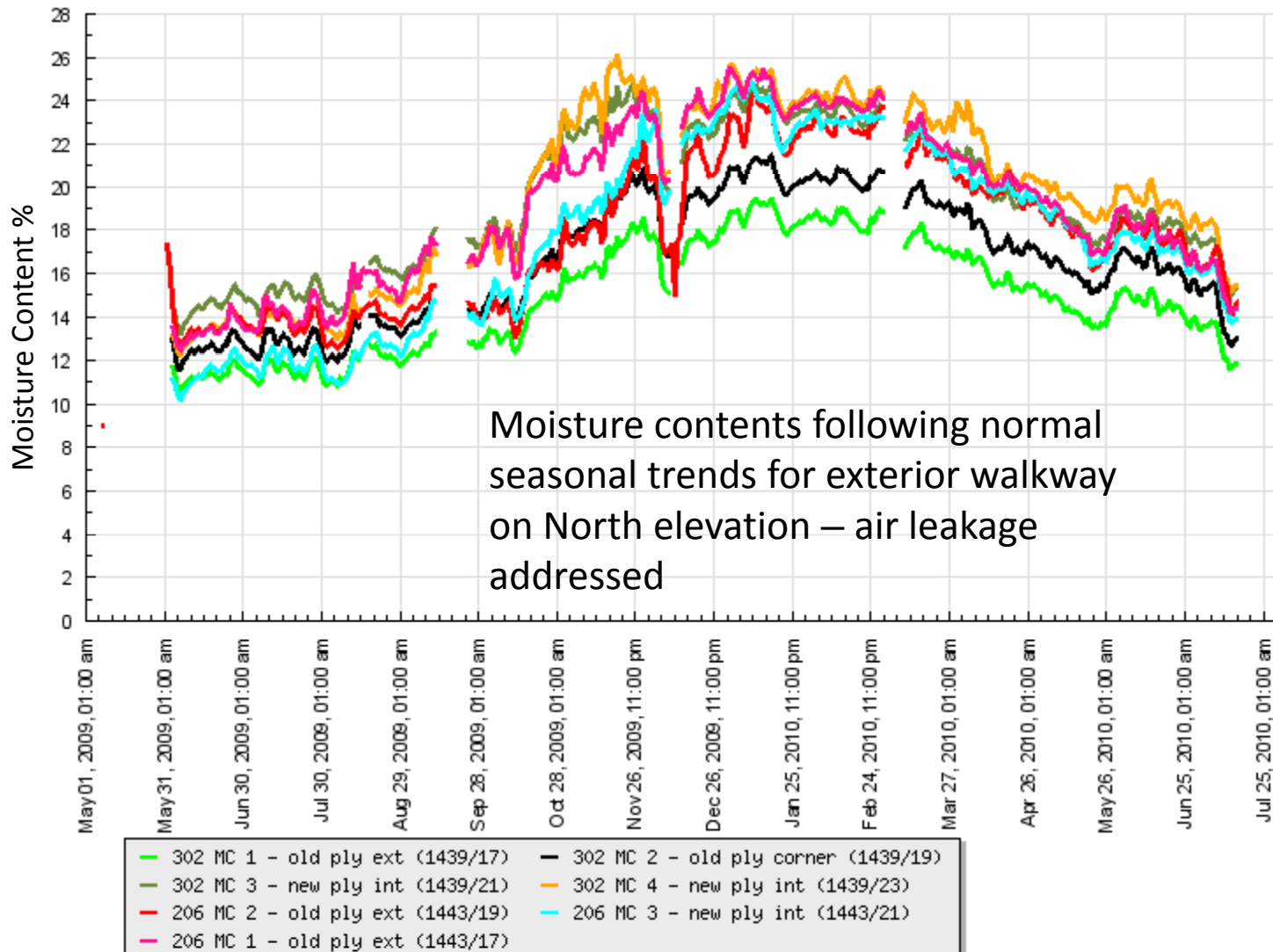
- Walkway Repair & Verification using moisture content monitoring



- Walkway Repair & Verification using moisture content monitoring



- Sensors installed at locations of severe damage and at control locations



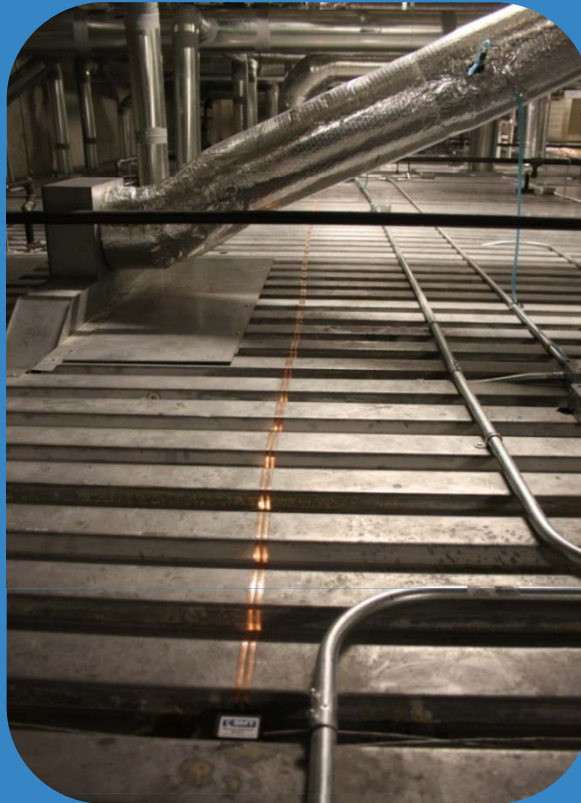


RESTORATION MONITORING SOLUTION



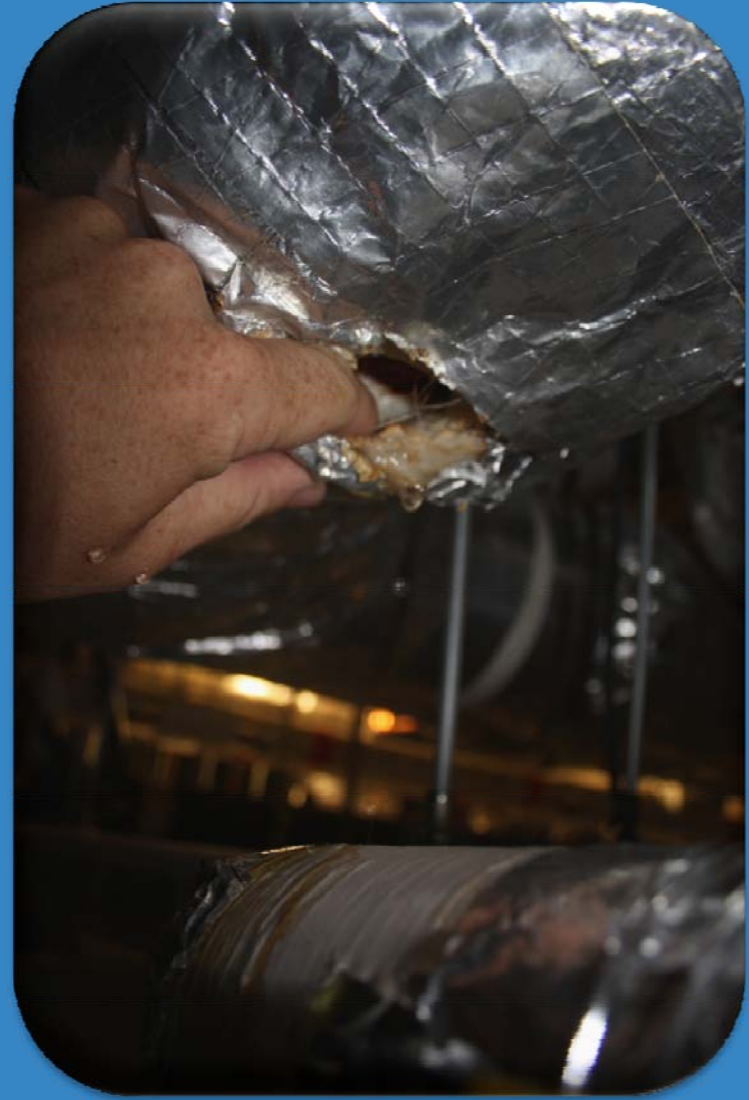


FLOOD MONITORING





FLOOD MONITORING





ROOF MONITORING



Roof Investigations –leave a wireless moisture sensor under the membrane to report back to you – get trends over time.



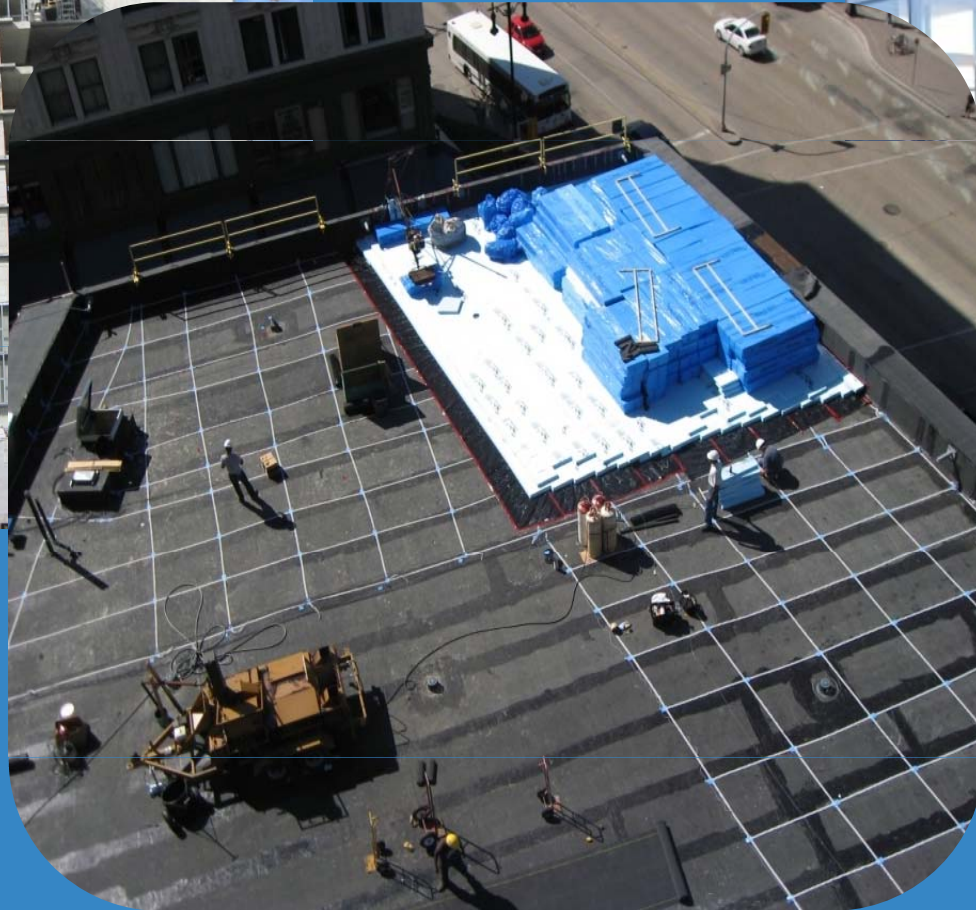
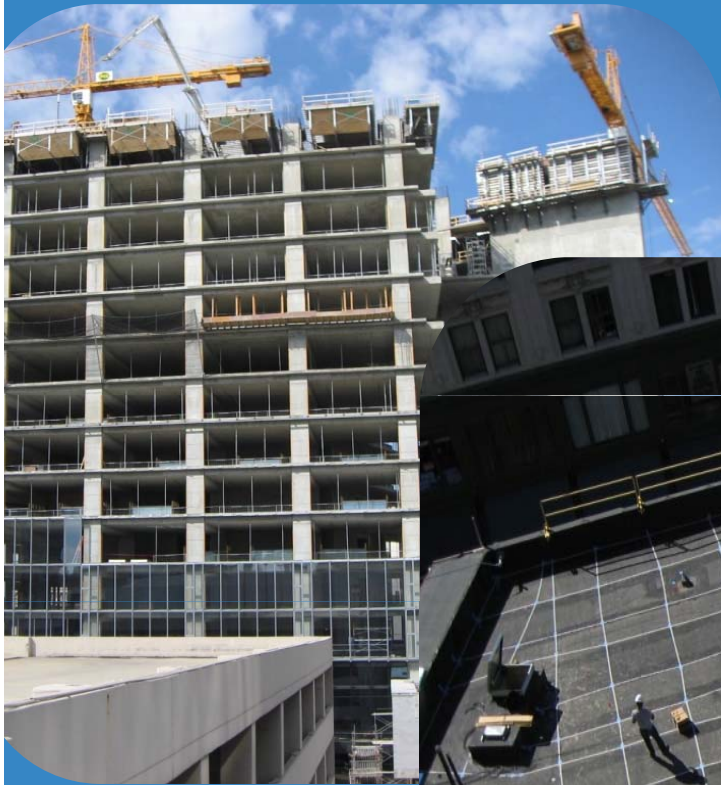
Roof Scan – Electric Field Vector Mapping – a manual procedure in which we evaluate typical inverted roof decks to pin-point leaks.



Roof Monitoring – Include an automated system in your next new or re-roof project that you can get a moisture accumulation info without ever leaving the comfort of our office.



ROOF MONITORING





END OF LIFE



ICBEST 2010 Publication: MONITORING OF HISTORIC STRUCTURES FOR
WHOLE BUILDING IMPROVEMENTS





THANK YOU

www.smtresearch.ca

