

Test Report

Prepared For:
Interface Protection Group

Test Performed:
House Blanket Retardant Test

Report No: GVLT-093018-1
Report Version: Original

Material Receive Date: September 30, 2018
Test Dates: September 30, 2018
Report Date: November 19, 2018

Test Summary

Testing Overview

Test was performed per customer guidelines. A total of 34 Thermocouples were connected inside and around both structures to monitor temperatures during a controlled burn. Data was collected with Data Acquisition Systems and stored for evaluation. JA King was only responsible for data collection, and did not perform the actual burn.

Test Number: GVLT-093018-1

Test Specimen(s): Thermal Protection Blanket

Personnel in Charge of the Test:

<u>Personnel</u>	<u>Client</u>
T.C. Beinke Test Engineer Office: 864.293.8421	Brian Vaughn Interface Protection Group

General Test Results

Part Number	Intact After Burn	Notes
Building 1	Yes	Building had No Burn Damage
Building 2 (control)	No	Full Involvement and Destruction

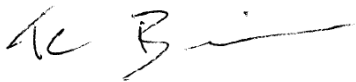
Client

Interface Protection Group
Contact Name: Brian Vaughn

Test Facility

J.A. King
1200 Woodruff Road, A-16
Greenville, SC 29607
Phone: 864.293.8421
Contact Person: T.C. Beinke

The following persons verified and guarantee the accuracy and validity of the information presented in this report in accordance the specifications required by the client:



T.C. Beinke
Test Engineer
J.A. King

Report Revision History

Revision	Description
0	Original Release

Glossary

Thermocouple:

A thermoelectric device for measuring temperature, consisting of two wires of different metals connected at two points, a voltage being developed between the two junctions in proportion to the temperature difference.



Data Logger:

An electronic device that records data over time or in relation to location either with a built in instrument or sensor or via external instruments and sensors. Increasingly, but not entirely, they are based on a digital processor (or computer).



Flir Camera:

Forward-looking infrared device typically used on military and civilian aircraft, which uses a thermographic camera to sense infrared radiation.

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1 Preliminary

1.1 Test Methods

Per customer guidelines, the building was wired with 34 K type thermocouples that were connected to two Graftech GL-240 and one Graphtec GL-840 temperature loggers/data acquisition units. These units were then buried underground in a cooler for their protection. During the burn a Flir Thermal Imaging Camera was used to verify temperatures and give a heat map of the burn area. An O₂ sensor was also used to collect air quality data during testing. Images were taken pre/post and mid test.

1.2 Procedure/Setup

Five Thermocouples were placed in the interior of the test building (building 1) and six thermocouples were placed on the exterior. The building was then wrapped with the thermal protection blanket, and twelve thermocouples were placed on the exterior of this blanket. An unprotected control building (building 2) was set in front of the test building. One thermocouple was placed in the interior of Building 2 and four thermocouples were placed on the exterior. Six Thermocouples were also placed in the surrounding brush pile that was set on fire. The data loggers began recording data before the surrounding woods were set on fire. Images were taken at this point. Test time was taken from the time the control building was set on fire. Standard and thermal images were taken throughout the test. The next morning after the fire was completely extinguished, the building was re-entered, inspected and the data recorders and thermocouples were removed.

1.3 Equipment Information

- **Data Acquisition Unit Model:** Graphtec GL240
- **Data Acquisition Unit Serial Number:** NAS-086
- **Data Acquisition Unit Calibration Due Date:** August 24, 2019

- **Data Acquisition Unit Model:** Graphtec GL240
- **Data Acquisition Unit Serial Number:** NAS-087
- **Data Acquisition Unit Calibration Due Date:** August 24, 2019

- **Data Acquisition Unit Model:** Graphtec GL840
- **Data Acquisition Unit Serial Number:** NAS-093
- **Data Acquisition Unit Calibration Due Date:** October 26, 2019

- **Type K Thermocouple Wire Model:** Ultra Electronic KSL-20-HTG\HTG Yellow Tracer
- **Type K Thermocouple Wire Serial Number:** Lot # 1234500577
- **Type K Thermocouple Wire Calibration Due Date:** August 10, 2019

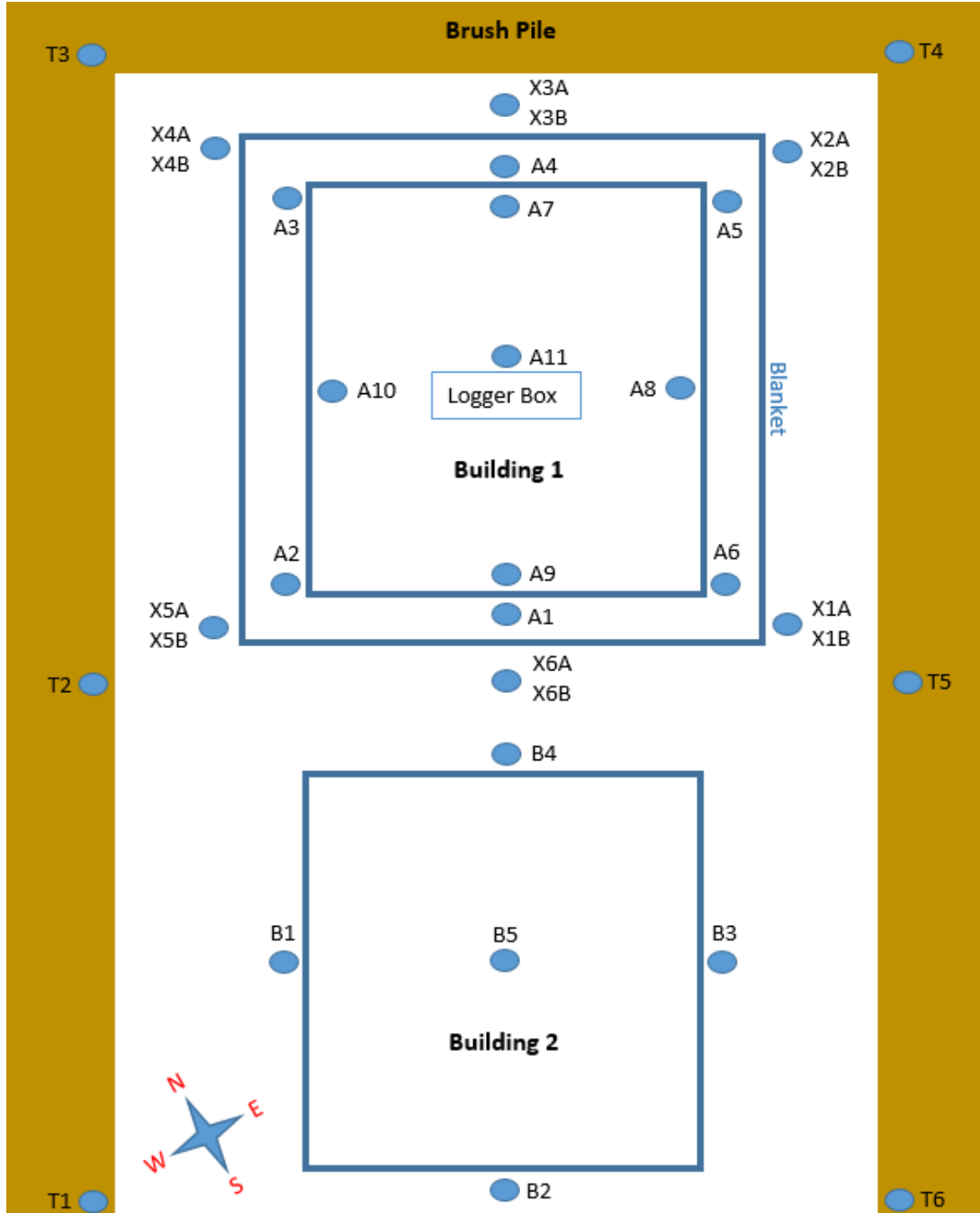
- **FLIR Thermal Imaging Camera:** For Reference Only

- **O₂ Sensor:** For Reference Only

1.4 Parts Tested

Company	Description	For Use
Interface Protection Group	Fire Protection Blanket	Home Protection Against Burn During Surrounding Fire Such As Forest Fire

1.5 Thermocouple Diagram



Initial Thermocouple Set up

2 Photographs

2.1 Pre-Test



Standard Exterior Images



Flir Exterior Image



Standard Test Building Interior Image

2.2 Initial Ignition of Control Building



Standard Image

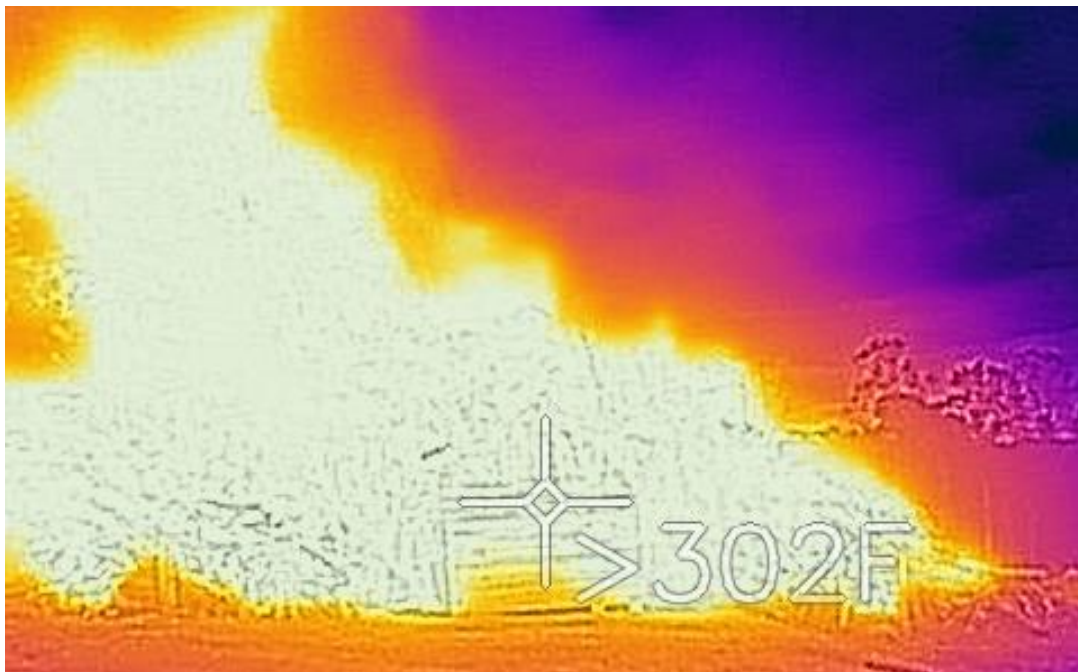


Flir Image

2.3 Fully Engulfed Control Building



Standard Image

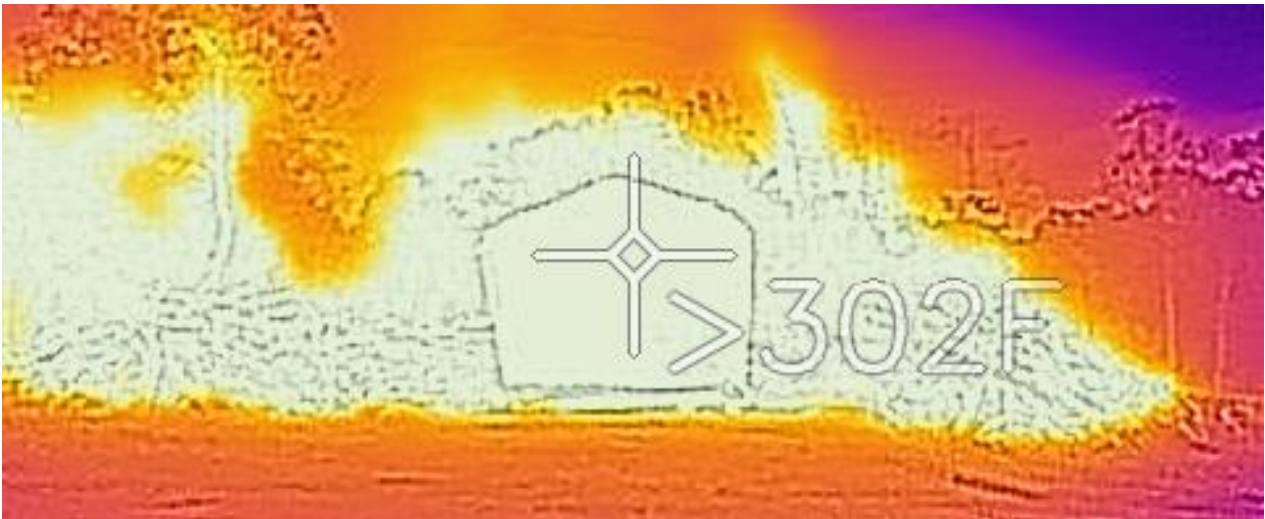


Flir Image

2.4 Collapse of Control Building



Standard Image

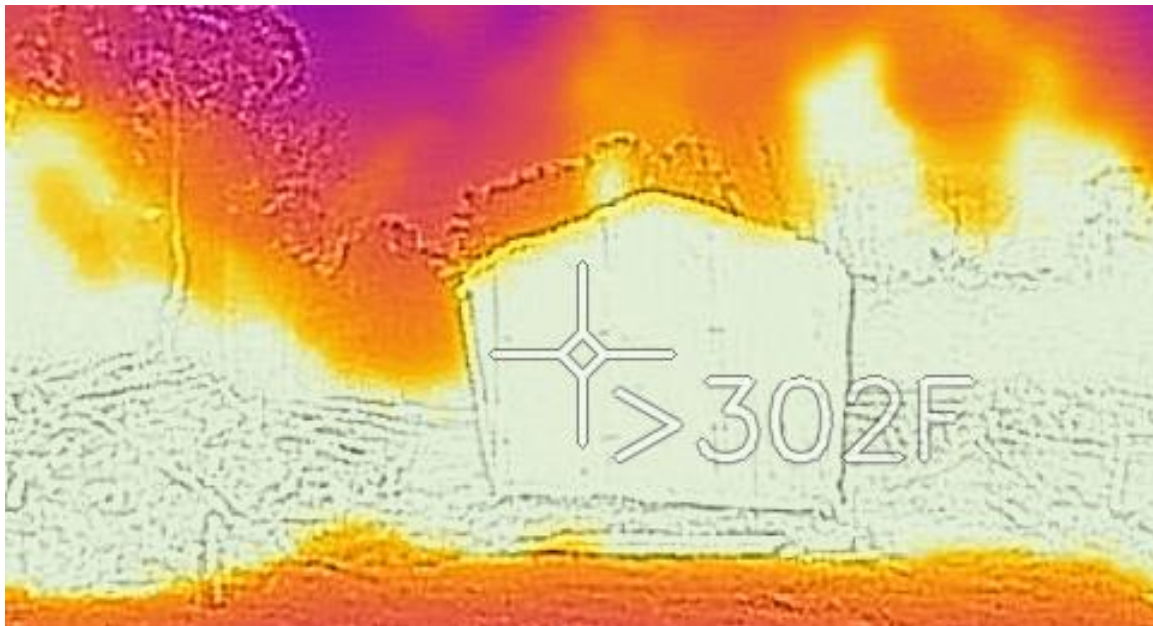


Flir Image

2.5 Post-Test (Fire Receding)



Standard Exterior Image



Flir Image



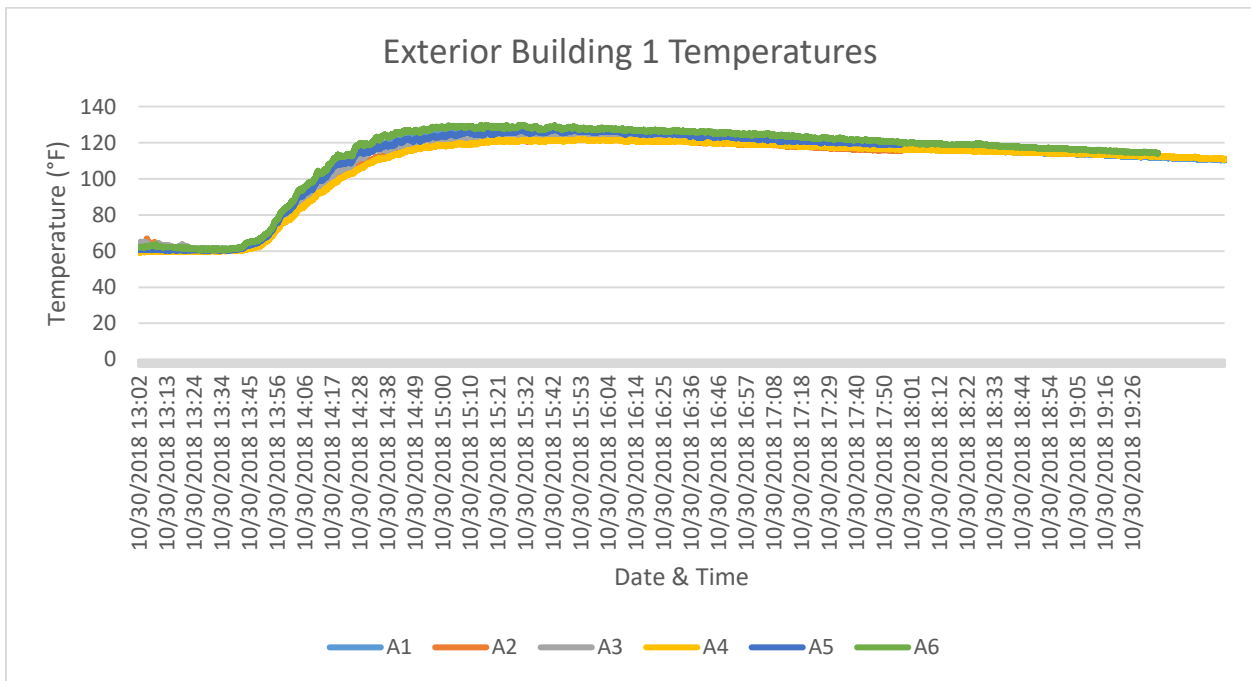
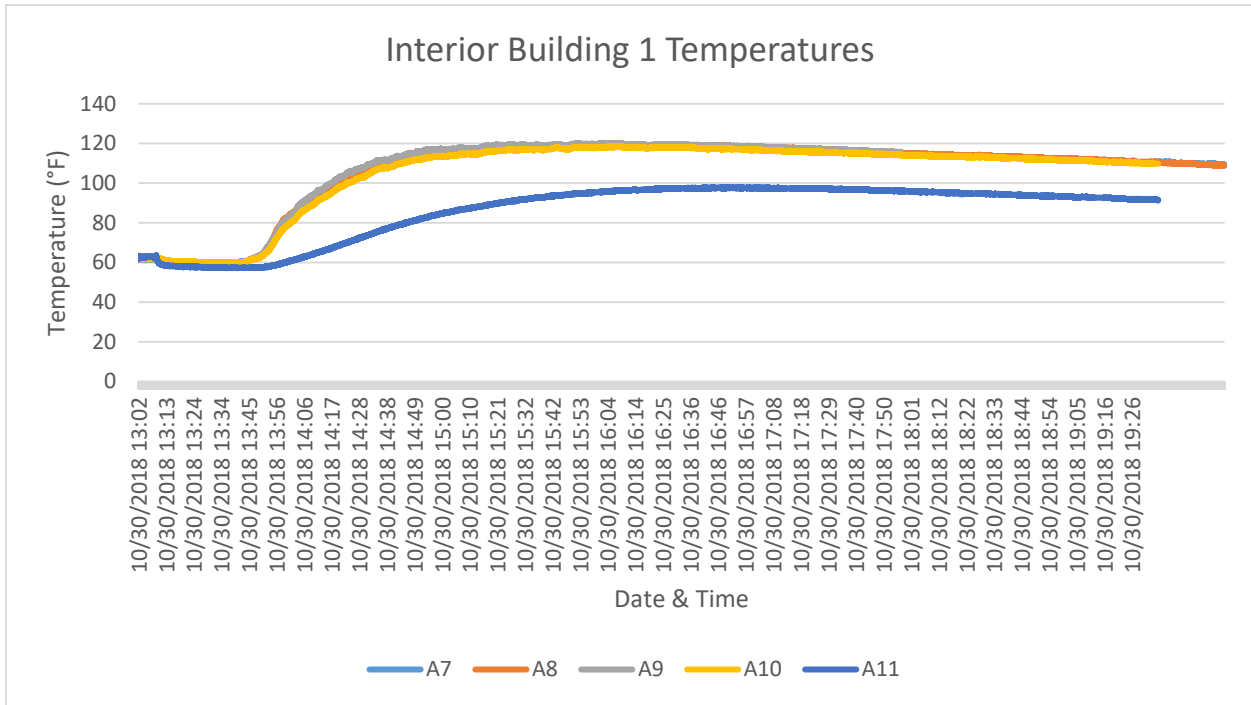
Standard Building 1 Interior Images

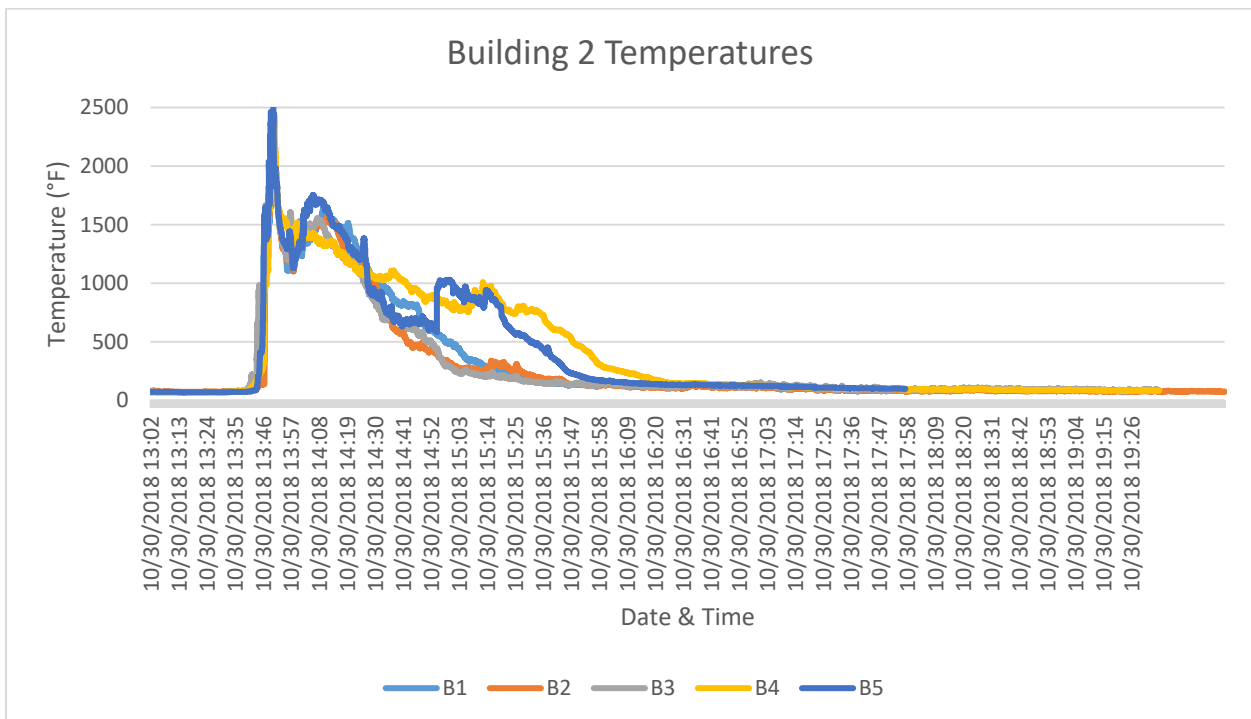
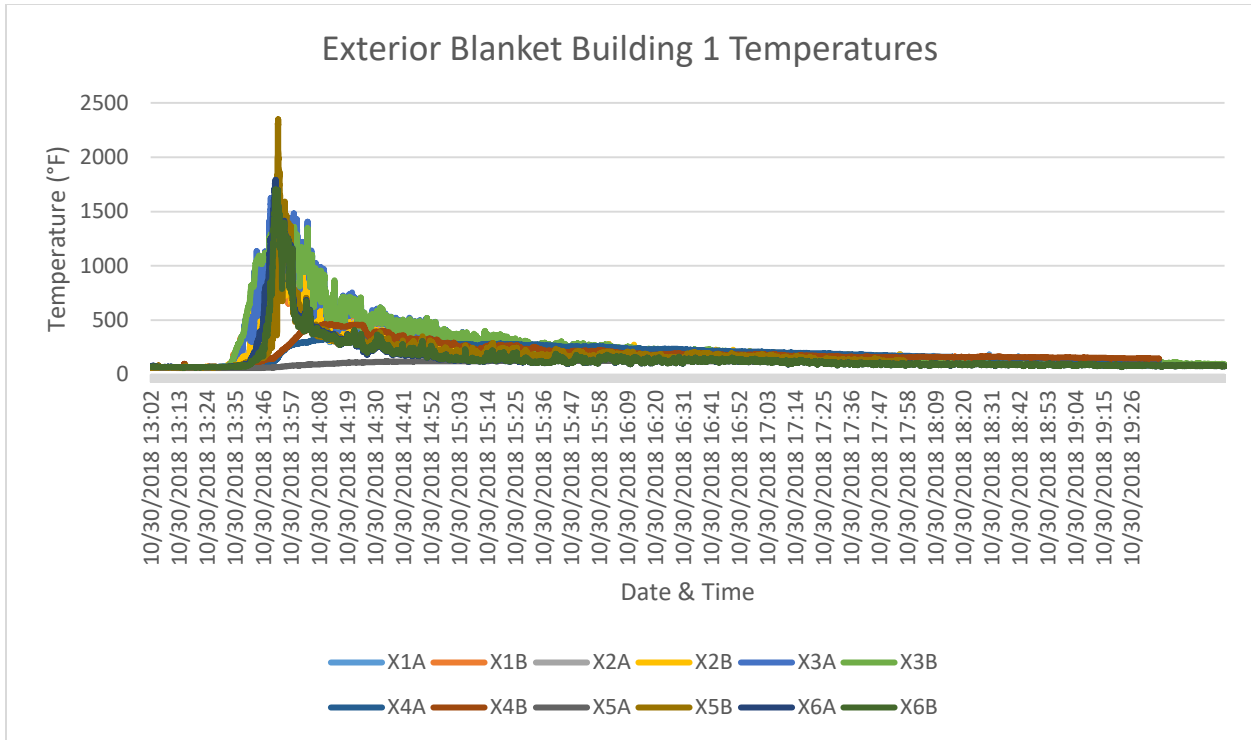
3 Evaluation

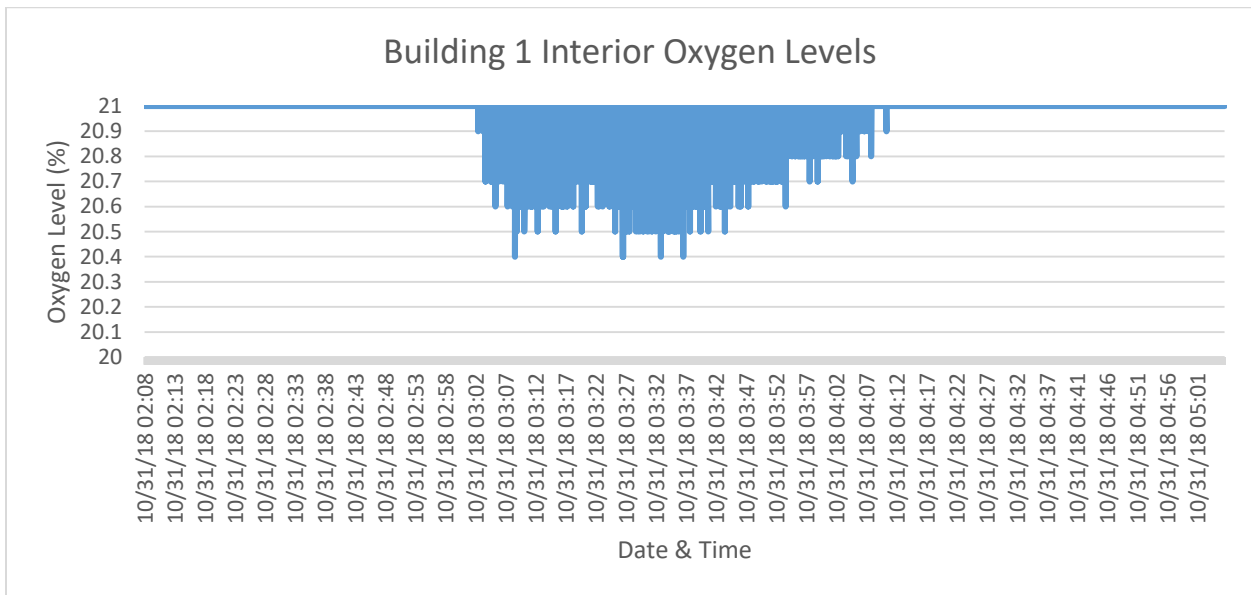
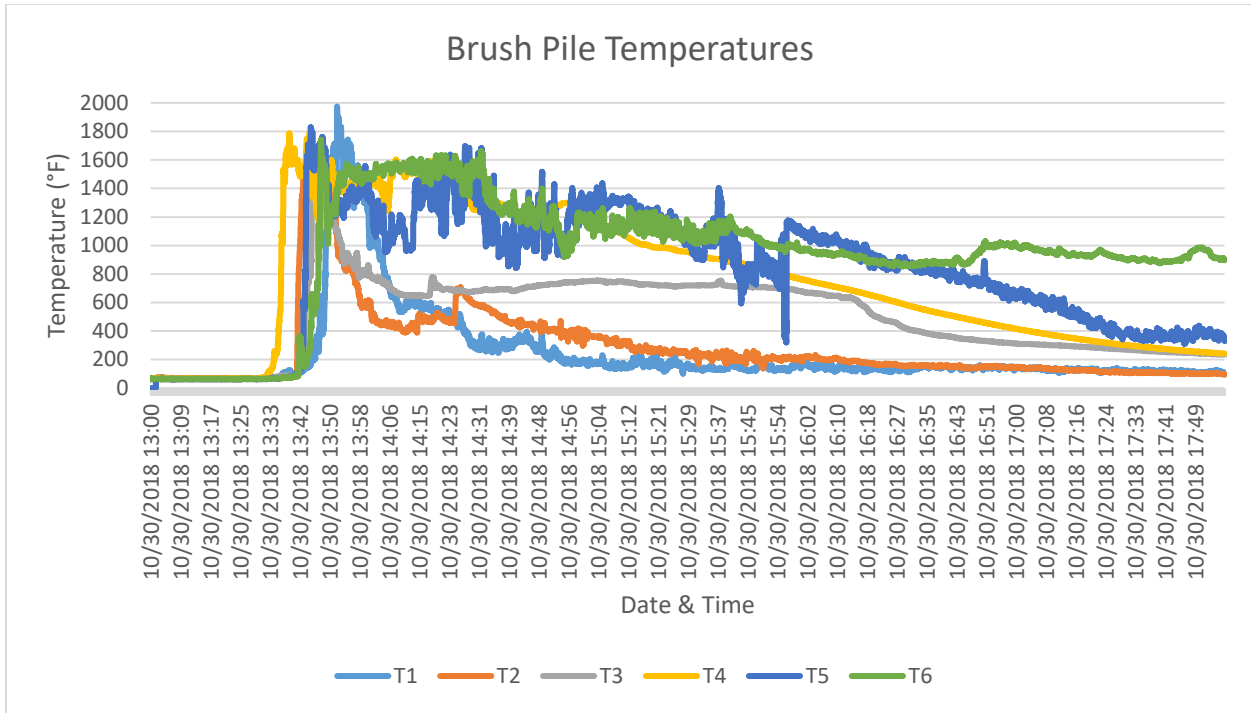
3.1 Visual/Sensory

The burn started at 1:30pm. The control building had first ignition at 1:44pm and collapsed at approximately 1:52pm. The test structure remained intact throughout the test, and no burning was visible on the thermal wrap. At re-entry the building appeared unharmed and there was no lingering smoke smell. The data acquisition systems remained in working order after test completion.

3.2 Plots







***** See Separate File Raw Data for Report GVLT 093018-1 *****