

**CLIENT:** WILLIAMS BROTHERS CORPORATION OF AMERICA  
1330 Progress Dr.  
Front Royal, VA  
USA 22630

**Engineering Evaluation Report No: BUR0542-ENG2**

**Issue Date: March 21, 2025**

**PRODUCT ID:** Williams Brother's 22 in. x 30 in. (559 mm x 762 mm) DW 405 Phantom gypsum ceiling access door. Detailed descriptions and drawings of this product can be found in Section 2.0 and the Appendix of this report.

**AUTHORIZATION:** QAI Proposal 25RT01281 dated January 28, 2025, signed by Williams Brothers Corporation of America personnel Angie Williams, Vice President on February 6, 2025.

**EVALUATION REQUESTED:** Engineering Services / Engineering Evaluation of Williams Brothers's DW 405 PHANTOM ceiling access door as described in this report to performance properties from the following criteria:

- ASTM E119-24, *Standard Test Methods for Fire Tests of Building Construction and Materials (ASTM E119)*.
- CAN/ULC S101-14, *Standard Methods of Fire Endurance Tests of Building Construction and Materials (ULC S101)*.

**CONCLUSIONS:** Based on the rationale presented in this report, it is the professional opinion of QAI Laboratories, Ltd. that Williams Brother's 22 in. x 30 in. (559 mm x 762 mm) DW 405 Phantom gypsum ceiling access door when installed a steel stud, plywood and gypsum floor/ceiling assembly as outlined in section 2.0 of this report, would achieve a 45-minute fire resistance rating accordance with ASTM E119-24 and CAN/ULC S101-14.

**Prepared By:**



Connor Rasilainen, EIT  
Project Specialist

**Signed for and on behalf of  
QAI Laboratories Ltd.**



Scott Leduc  
Supervisor – Fire Laboratory

## 1.0 EVALUATION PURPOSE:

At the request of Williams Brothers Corporation of America, (Williams Brothers) QAI Laboratories, Ltd. (QAI) has conducted an evaluation of Williams Brothers's 22 in. x 30 in. (559 mm x 762 mm) DW 405 Phantom ceiling access door installed in steel stud, plywood and gypsum floor/ceiling assemblies for fire-resistance ratings in accordance with ASTM E119-24 (ASTM E119) and CAN/ULC S101-14 (CAN/ULC S101).

This evaluation was conducted to determine if the Williams Brothers product listed above when installed in accordance with Section 2.0 of this report would achieve a 45-minute fire resistance rating for a floor/ceiling assembly when evaluated to the full requirements of ASTM E119 / CAN/ULC S101.

Testing conducted by QAI to the ASTM E119 / CAN/ULC S101 methods outlined in test report BUR0331-FT-3 dated February 14, 2025, performed on a Williams Brother's DW 405 Phantom ceiling access door in a steel stud, plywood and gypsum floor/ceiling assembly constructed as outlined in Section 2.0 of this report, will serve as a basis for this evaluation.

## 2.0 PRODUCT DESCRIPTION:

Testing of the DW 405 Phantom product installed in an assembly described below was done by QAI for Williams Brothers in accordance with ASTM E119 and CAN/ULC S101 on February 10, 2025. The tested assembly achieved a 45-minute fire resistance rating with deviations from the standard methods listed below.

**Table 1 – Test Assembly Description**

| COMPONENT                           | DESCRIPTION  |   |
|-------------------------------------|--------------|---|
| <b>Door and Frame Assemblies</b>    | Model:       | DW 405 Phantom access door  |
|                                     | Description: | 22 in. x 30 in. (559 mm x 762 mm) Gold Bond XP gypsum board frame and door.   |
|                                     | Door:        | 22.02 in. x 30.02 in. x 1 in. (559 mm x 763 mm x 25 mm) thick Gold Bond Gypsum board door with rounded corners and a 0.25 in. x 0.375 in. (6 mm x 9.5 mm) thick lip around the perimeter.   |
|                                     | Frame:       | 28 in. x 36 in. x 0.625 in. (711 mm x 914 mm x 16 mm) thick Gold Bond XP gypsum board with a 22.08 in. x 30.08 in. (561 mm x 764 mm) opening.   |
|                                     | Install:     | The frame was mounted to the steel framing with no. 6 x 1.25 in. (32 mm) self-drilling drywall screws spaced every 3 in. (76 mm).   |
| <b>Floor / Ceiling Construction</b> | Type:        | Steel stud with wood joist perimeter, gypsum board ceiling and plywood flooring.  |
|                                     | Framing:     | Nominal 2 in. x 8 in. (38 mm x 191 mm) Spruce-Pine-Fir (SPF) dimensional wood on the perimeter and to separate the door cavity from the remaining cavities. 3.625 in. x 1.25 in. (92 mm x 32 mm) steel stud support framing for the door and gypsum board was spaced 24 in. (610 mm) on center. |
|                                     | Ceiling:     | One layer of 0.625 in. (16 mm) Type X gypsum board.   |
|                                     | Sub-Floor:   | One layer of 3/4 in. (20 mm) plywood.   |

*Refer to the Appendix for product details and drawings.*

### **Deviation from the Test Standards:**

This assembly was tested under a positive pressure condition as required by NFPA 288.

The test was performed on a smaller size than ASTM E119 and CAN/ULC S101 requires but was tested on the largest available test specimen size.

Fewer thermocouples were used than required by the test standard due to the smaller sample size. Additional thermocouples were placed inside the cavity and on the supporting studs and plywood for comparative purposes.

### **3.0 REFERENCED STANDARDS AND REPORTS:**

- ASTM E119-24, *Standard Test Methods for Fire Tests of Building Construction and Materials (ASTM E119)*.
- CAN/ULC S101-14, *Standard Methods of Fire Endurance Tests of Building Construction and Materials (ULC S101)*.
- QAI Test Report BUR0331-FT-3 dated February 14, 2025,

## 4.0 ENGINEERING EVALUATION:

QAI Test Report BUR0331-FT-3 conducted to ASTM E119 and CAN/ULC S101 (with deviations from these standards listed above) on a steel stud, plywood and gypsum floor/ceiling assembly with Williams Brothers's 22 in. x 30 in. (559 mm x 762 mm) 405 Phantom ceiling access door was reviewed and these results were evaluated to determine if the achieved fire-resistance rating for this assembly was applicable to the full requirements of ASTM E119 and CAN/ULC S101 for a full scale floor/ceiling assembly.

The testing conducted by QAI was done using a mid-scale size furnace on an assembly that was smaller than the requirements prescribed in ASTM E119 and CAN/ULC S101. This report is evaluating the impact of the presence of the DW 405 Phantom ceiling access door on the assembly to determine if these results would continue to apply to the full-scale assembly size prescribed in ASTM E119 and CAN/ULC S101.

The table below shows the maximum temperature rise after 45 minutes of fire exposure measured by thermocouples placed on the unexposed side the assembly at the location of the DW 405 Phantom ceiling access door.

**Table 2 – Maximum Unexposed Temperature Rise**

| PROPERTY                 | INITIAL TEMP       | MAXIMUM TEMP        | TEMP RISE           | TEMP RISE LIMIT  |
|--------------------------|--------------------|---------------------|---------------------|------------------|
| Average Temperature      | 60.4°F<br>(15.8°C) | 197.6°F<br>(92.0°C) | 137.2°F<br>(76.2°C) | 250°F<br>(140°C) |
| Single Point Temperature | 61.1°F<br>(16.2°C) | 199.4°F<br>(93.0°C) | 138.3°F<br>(76.8°C) | 325°F<br>(181°C) |

The maximum average temperature limit of 250°F (140°C) above the initial, and the single point maximum temperature limit of 325°F (181°C) above initial were not reached for the 45-minute duration of the fire endurance test. The mid-scale testing conducted by QAI follows the same time/temperature curve as would be applied during the full-scale testing, and although the full scale assembly may experience higher temperature rise during the test, it is QAI's opinion that the significant margin between the unexposed temperature and the temperature limit is significant enough that the full scale assembly would be expected to maintain temperature rise values below the limits specified above.

Additionally, during testing thermocouples were placed on stud and plywood locations adjacent to the DW 405 Phantom ceiling access door and additional thermocouples were placed on studs and plywood in locations where the stud cavity did not contain a door. The maximum final temperatures after 45 minutes of fire exposure are shown in the table below.

**Table 3 – Maximum Stud/Cavity Temperatures**

| MEASUREMENT TYPE  | MAXIMUM TEMPERATURE STUD | MAXIMUM TEMPERATURE CAVITY |
|---|--------------------------|----------------------------|
| Stud/Cavity Temperature<br>(at DW 405 Location)         | 715°F<br>(379°C)         | 572°F<br>(300°C)           |
| Stud/Cavity Temperature<br>(Cavity without Access Door) | 781°F<br>(416°C)         | 739°F<br>(393°C)           |

After 45 minutes of fire exposure, the DW 405 Phantom ceiling access door resulted in lower stud and cavity temperatures compared to the studs and plywood in the cavity that did not contain a door as described in Table 1. As a result, the DW 405 Phantom is expected to offer equivalent or superior protection, with regards to temperature rise under fire exposure, to the structural members when compared to those cavities that did not contain a door as described in this report. These results show that the DW 405 Phantom ceiling access door would not compromise the structural integrity and fire resistance capability of the assembly under fire exposure in comparison to the areas protected by gypsum board and would be expected to meet the full-scale requirements of ASTM E119 & CAN/ULC S101 for this assembly.

It should also be noted that the presence of the DW 405 Phantom gypsum access door did not result in flaming or through penetrations observed for the 45-minute duration of the fire endurance test.

## **5.0 CONCLUSION:**

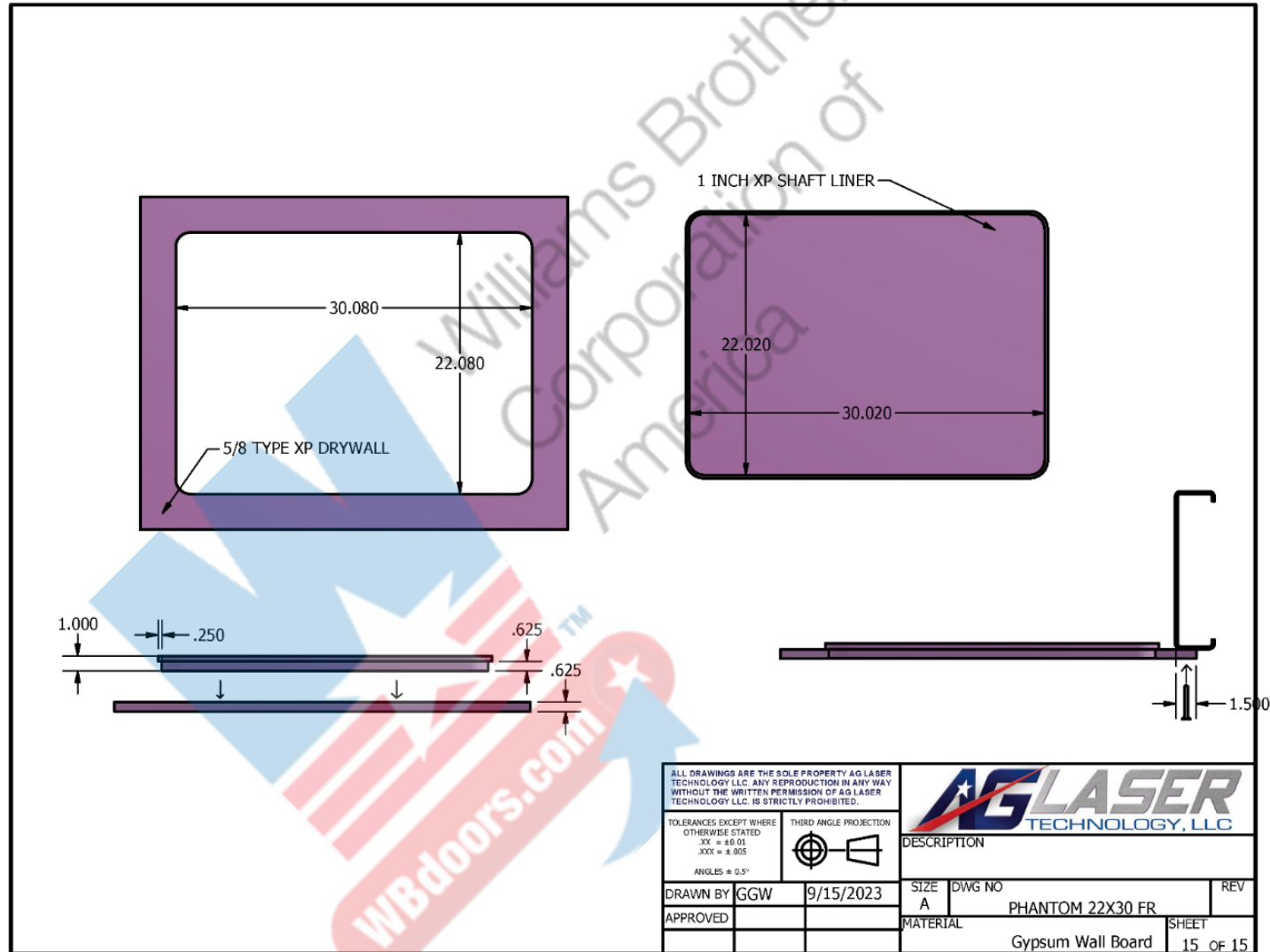
It is the professional opinion of QAI Laboratories, Ltd. that based on the rationale presented in this report, that Williams Brother's 22 in. x 30 in. (559 mm x 762 mm) DW 405 Phantom gypsum ceiling access door when installed in steel stud, plywood and gypsum floor/ceiling assembly as outlined in section 2.0 of this report, would achieve a 45-minute fire resistance rating in accordance with the performance requirements of ASTM E119-24 and CAN/ULC S101-14 when installed as described in this report.

## APPENDIX

| PAGE | DESCRIPTION                              |
|------|--|
| 7    | DW 405 Phantom Product Drawings          |
| 8    | DW 405 Phantom Installation Instructions |

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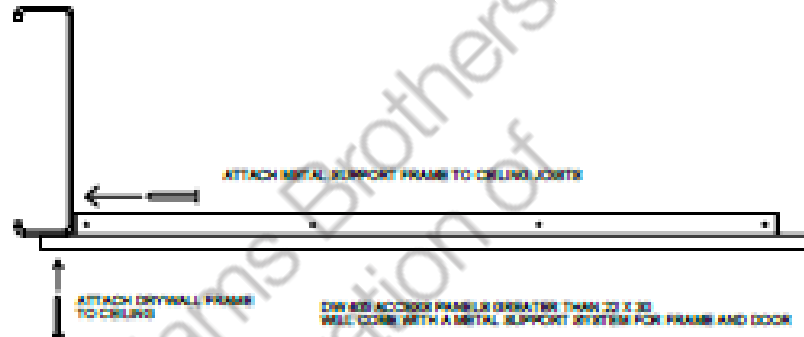


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## WB-DW 405 Phantom™ OVERSIZE All Drywall Ceiling Access Door

Patent Pending,  
Invented by Gabriel Williams

### OVERSIZE CEILING INSTALLATION



**1. FRAME THE OPENING:** Frame all four sides of the opening with approved joist framing, the frame opening is to be 6 inches greater than the door size. It is recommended to use screws every 3 inches to secure the frame to the newly set joists. The Screw length for steel is 1-1/8"; for wood is 1-1/4".

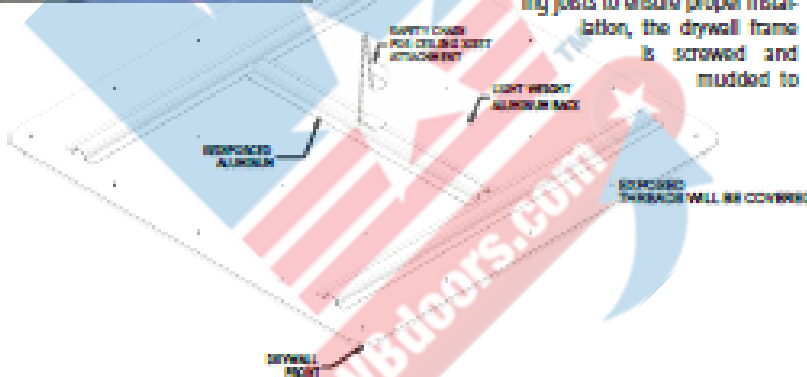
**2. OVERSIZE INSTRUCTION:** Oversize DW 405 Phantom Access Panels are made with a metal support system to increase the durability of the product. The metal support system is attached to the frame via screws. This metal support system must be screwed directly to the ceiling joists to ensure proper installation, the drywall frame is screwed and mudded to

the ceiling joists as well by securing the frame from 2 directions into the ceiling.

**3. THREAD COVERS** are provided to cover exposed screws of the door opening assembly.

**4. DOOR INSERT** of the Oversized DW 405 Phantom is made of light weight aluminum and has a chain assembly that allows the door to be directly chain to the ceiling for security. The aluminum backing prevents any damage to the drywall when shifting the door in the ceiling.

**5. MOUNTING:** Once the frame is mounted and secured, drywall tape may be applied to the seam with drywall mud accordingly until flush and concealed. Apply paint. Since all units are made to specification, the door may be finished prior to ceiling installation. The screws can be mudded and the panel painted. Proceed to insert the panel into the frame. Ensure no cracks or chips are in the door or frame so that it is secure. Proper installation is required as to ensure the door will not fall out of ceiling.



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| DATE              | REVISION | CHANGE DESCRIPTION | INITIALS |
|-------------------|----------|--------------------|----------|
| March 21,<br>2025 | -        | Original Report    | CR       |

\*\*\*\*\*<END OF REPORT>\*\*\*\*\*

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