JENSEN HUGHES

Advancing the Science of Safety

June 30, 2021

DuPont™ Performance Building Solutions
1501 Larkin Center Drive
Midland, MI 48642

RE: DuPont™ Tyvek® Water-Resistive Barrier Systems – Part III (Thermax™)
Various NFPA 285 Complying Exterior Wall Constructions
Project No.: 1JJB05306.011

To Whom It May Concern:

This analysis provides a summary of various exterior wall constructions that incorporate DuPont™ Tyvek® water-resistive barrier (WRB) systems and DuPont™ Thermax™ Brand Rigid Insulation foam plastic insulation and which will meet the requirements of NFPA 285, *Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.*

Section 2603.5.5 of the International Building Code (2000 through 2021 Editions) requires that exterior walls systems that incorporate foam plastic insulation shall meet the requirements of NFPA 285.

Additionally, Section 1403.5 in the 2012 and 2015 editions of the International Building Code (Section 1402.5 in the 2018 and 2021 editions) requires that exterior walls systems installed on buildings greater than 40-ft. above grade plane on buildings of Type I, II, III or IV construction that incorporate combustible water-resistive barriers shall also meet the requirements of NFPA 285.

DuPont™ has performed an NFPA 285 fire test on an exterior wall system that incorporated both the DuPont™ WRB materials and Thermax™ Brand Rigid Insulation. This test was successful and is reported in Southwest Research Institute Final Report No. 01.16046.01.610b, dated November 30, 2012.

Based on the results of this test, additional small-scale tests of other DuPont™ water-resistive barriers and our experience with the NFPA 285 fire test, it is our judgment that the various configurations of exterior walls described in the attached Table will meet the performance requirements of NFPA 285. Special opening header details are shown in Figures 1, 2, and 3 must be incorporated into the exterior wall design when Thermax™ insulation is used (Table 1, Exterior Insulation, Item #3) to maintain compliance with NFPA 285.

This analysis is based on the specific construction materials installed in the manner described in the referenced test report(s). Changes or modifications to the construction and/or materials used in the tested assembly may result in a different fire performance and may change this analysis.

This analysis does not address other performance characteristics such as weatherability, durability or structural issues.

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I hope that this information is of assistance and if you have any questions, please feel free to contact me at 443-313-9891 or aparker@jensenhughes.com

Sincerely,

Arthur J. Parker, P.E.
Sr. Fire Protection Engineer

Table 1. Walls with DuPont™ WRB Systems and Thermax™ Insulation

Wall Component	*Materials*
Base wall system – Use either 1, 2, 3, 4, 5 or 6	1. Concrete wall 2. Concrete Masonry wall 3. Standard clay brick wall without other combustible materials 4. Adobe block wall 5. Steel Stud Framed Wall – Minimum 20-gauge, 3⅝-inch deep studs, spaced a maximum of 24-inches OC with lateral bracing every 4 ft vertically. A minimum of 1 layer of ⅝" Type X gypsum wallboard on interior face of studs. Optional: 1 layer of maximum 6 mil thick polyethylene plastic interior vapor barrier or equivalent can be applied. 6. Wood studs: nominal 2-inch × 4-inch or greater FRTW wood studs spaced at a maximum of 24-inch OC. Wall cavity empty (no insulation) or filled with fiberglass batt insulation (faced or unfaced) or mineral wool insulation (faced or unfaced). One layer of ⅝-inch thick Type X gypsum wallboard installed on interior face of wood studs. One layer of ⅝-inch thick Type X exterior gypsum sheathing installed on exterior face of wood studs. Minimum two top plates at floorlines. As an option, any thickness of plywood or OSB may be installed on exterior face of wood studs under exterior gypsum sheathing.
Floorline Firestopping – required for curtain wall construction	With Base wall system No. 5 above, 4 lb/cu ft. mineral wool (e.g., Thermafiber) in each stud cavity and at each floorline – friction fit into cavity, attached with Z-clips or equivalent
Interior Vapor/Moisture barrier – Use either 1 or 2	1. None 2. Any 6-mil thick polyethylene film
Cavity Insulation – Use either 1 or 2	1. None 2. Any noncombustible insulation (faced or unfaced)
Exterior sheathing – Use either 1 or 2	1. ½-inch thick, exterior gypsum sheathing 2. ⅝-inch thick, Type X, exterior gypsum sheathing
Water-resistive barrier applied to exterior sheathing – Use either 1, 2, 3, 4 or 5	1. None 2. DuPont™ Tyvek® CommercialWrap® 3. DuPont™ Tyvek® CommercialWrap® D 4. DuPont™ Tyvek® ThermaWrap® LE 5. DuPont™ Tyvek® Fluid Applied WB+™ – nominal 25 wet mil thickness Note: Air/water barrier to be installed in accordance with mfg. recommended installation instructions. Maximum 12" width flashing may be used with primer (if applicable), unless otherwise noted by mfg.
Exterior insulation – Use either 1, 2 or 3	1. None 2. Any unfaced noncombustible insulation 3. DuPont™ Thermax™ Brand Rigid Insulation (a former product of the Dow Chemical Company) – Total thickness to be a minimum of ⅝-inch to a maximum of 3-inch thickness

Wall Component	*Materials*
Weather-resistive barrier applied over noncombustible exterior insulation – Use either 1, 2, 3 or 4	1. None 2. DuPont™ Tyvek® CommercialWrap® 3. DuPont™ Tyvek® CommercialWrap® D 4. DuPont™ Tyvek® ThermaWrap® LE Note: Air/water barrier to be installed in accordance with mfg. recommended installation instructions. Maximum 12” width flashing may be used with primer (if applicable), unless otherwise noted by mfg.
Drainage Mat – Use either 1 or 2	1. None 2. DuPont™ Tyvek® DrainVent™ Rainscreen – Limited to use as: - Must be used in conjunction with any WRB shown above - Exterior veneers #1 thru #6 and #8 thru #11 when no air gap is present between the veneer and the DrainVent™.
Exterior Veneer – Use either 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or 11	1. Brick – Standard nominal 4-inch thick, clay brick with standard brick veneer anchors installed a maximum of 24-inches OC vertically on each stud. A maximum 2-inch air gap between exterior insulation and brick. 2. Stucco – Minimum ¾-inch thick, exterior cement plaster and lath. A secondary water-resistive barrier can be installed between the exterior insulation and the lath. The secondary water-resistive barrier shall not be full-coverage asphalt or butyl-based self-adhered membranes. 3. Stone veneer – Minimum 2-inch thick, Limestone or natural stone veneer or minimum 1½-inch thick cast artificial stone veneer. Any standard installation technique can be used. 4. Terracotta cladding – Use any terracotta cladding system in which terracotta is minimum 1¼-inch thick. Any standard installation technique can be used. 5. Metal veneer such as steel, aluminum, copper, etc. Any standard installation technique can be used. 6. Fiber cement siding or fiber cement panels – Any standard installation technique can be used. 7. MCM System – Use any Metal Composite Panel that has been successfully tested by the panel manufacturer via NFPA 285 test method. 8. Concrete Masonry Units (CMU) – Minimum 4-inch thick CMU with a 2-inch maximum air gap between exterior insulation and CMU. 9. Concrete Panels – Minimum 2-inch thick panel, with a 2-inch maximum air gap between exterior insulation and concrete panel. 10. Insulated Concrete Sandwich Panels – Minimum 2-inch thick outer and inner faces with a 2-inch maximum air gap between inner face and wall system. 11. Tabs II – Thin brick veneer Note: All exterior veneer/cladding systems must be installed in accordance with manufactures recommended installation instructions and with applicable building codes.
Special Conditions	Use any opening header treatment shown in Figures 1 through 3 for all openings (window, door, etc.) when Thermax™ insulation is used in the exterior wall (Exterior Insulation, Item #3).

Wall Component	*Materials*
Flashing of window, door and other exterior wall penetrations.	As an option, flash window, door and other exterior penetrations with limited amounts of asphalt, silicone, acrylic or butyl-based flashing tape – max. 12-inch width.

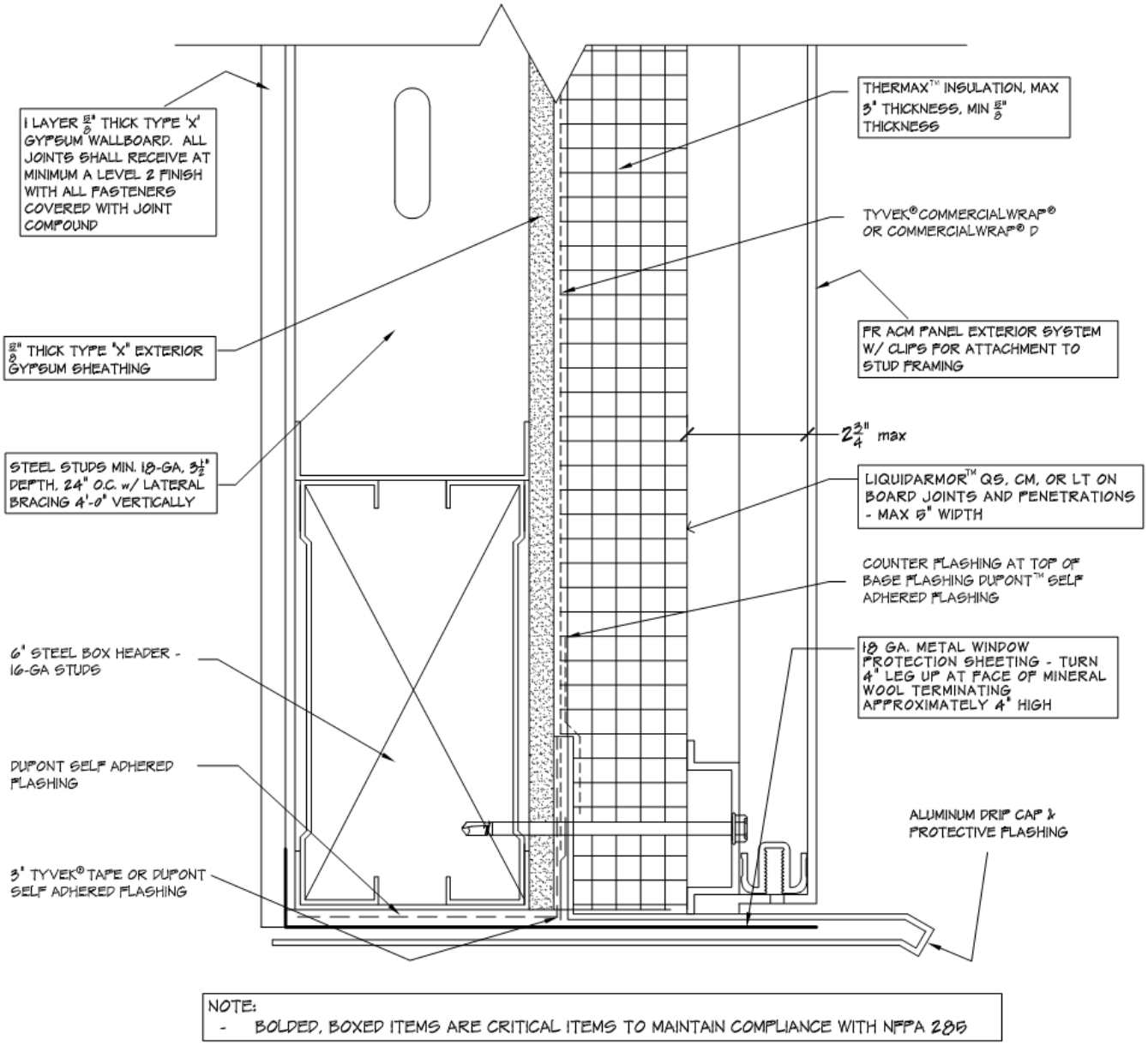

Figure 1 – Required NFPA 285 Opening Head Protection – DETAIL OPTION 1

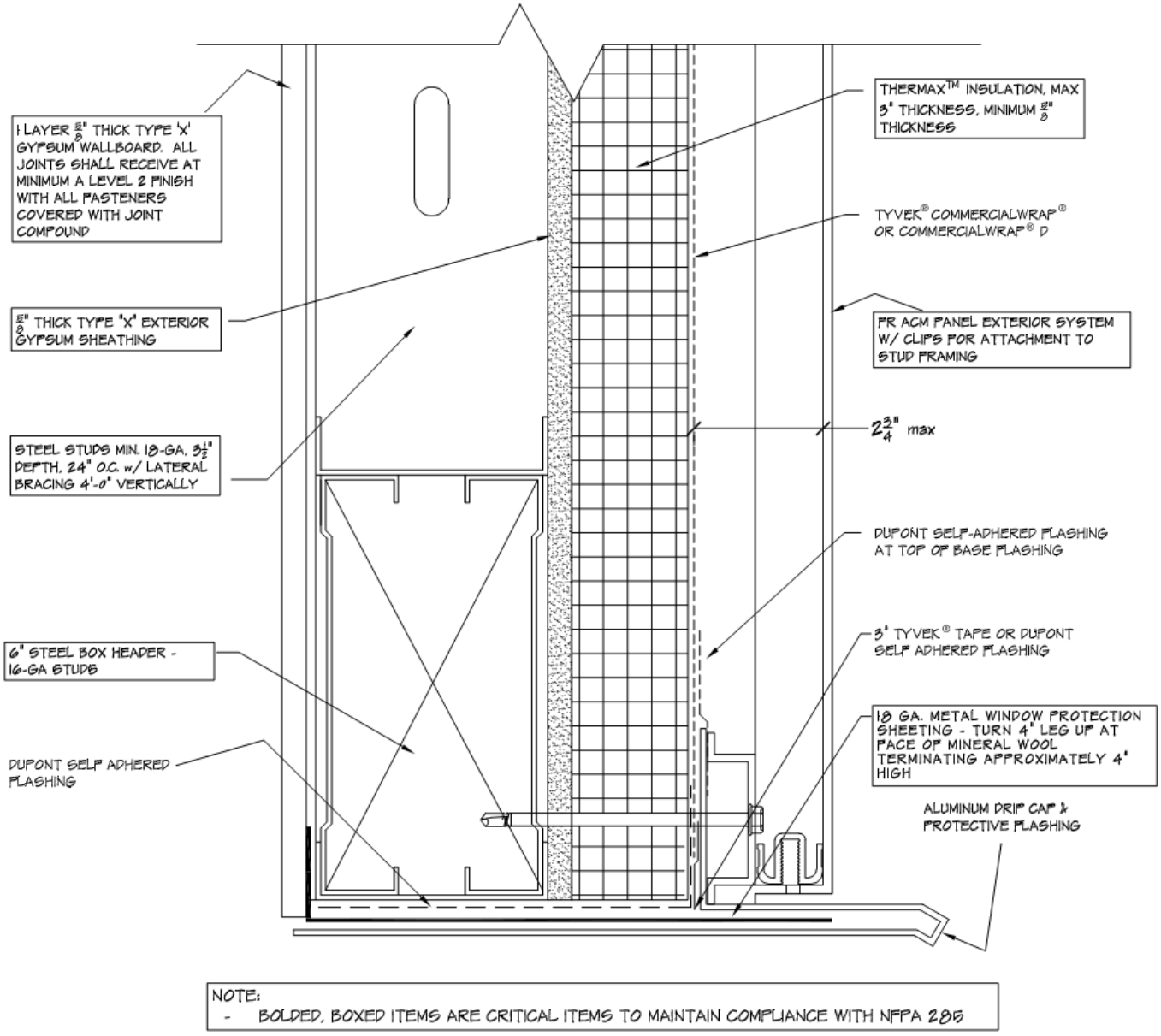

Figure 2 – Required NFPA 285 Opening Head Protection – DETAIL OPTION 2

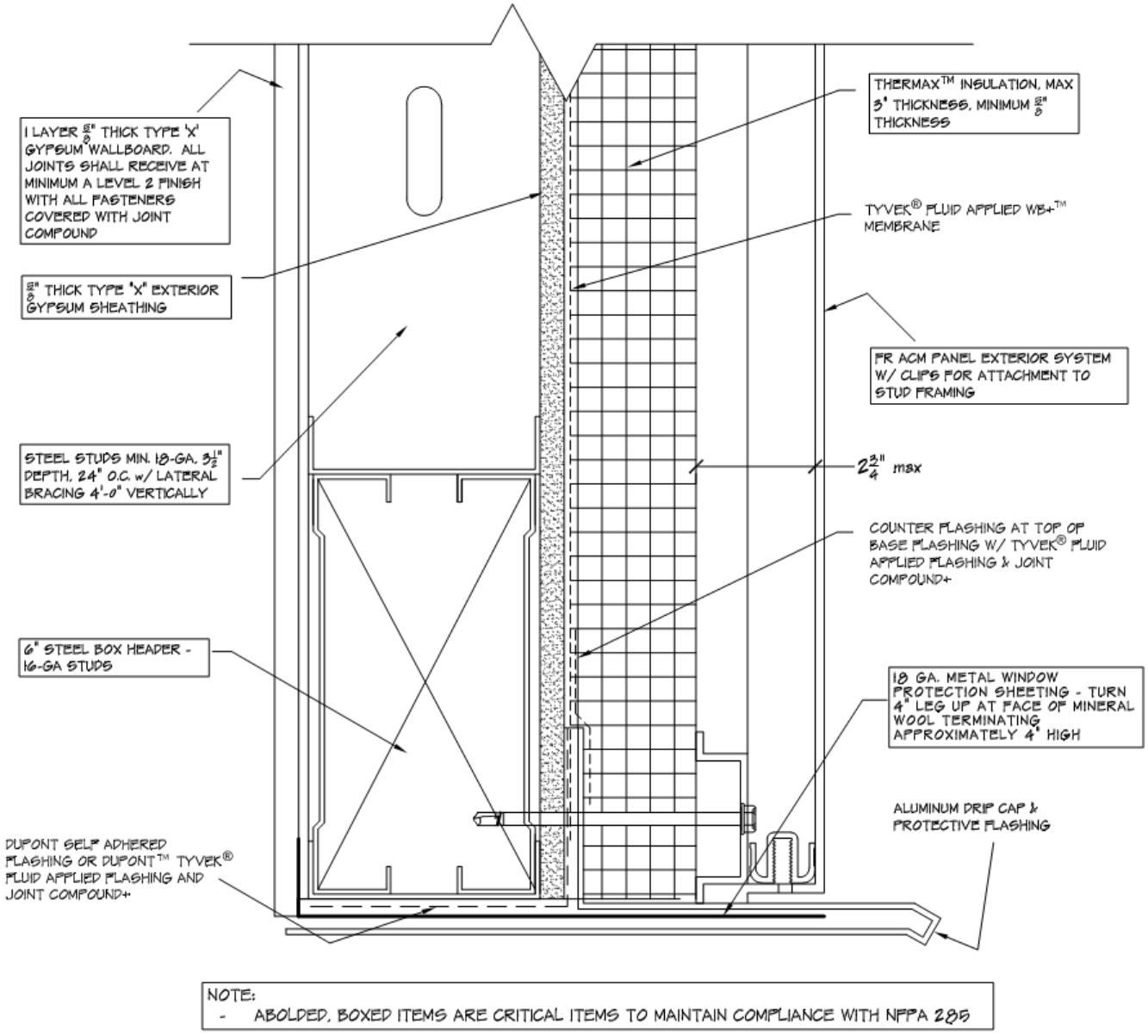

Figure 3 – Required NFPA 285 Opening Head Protection – DETAIL OPTION 3