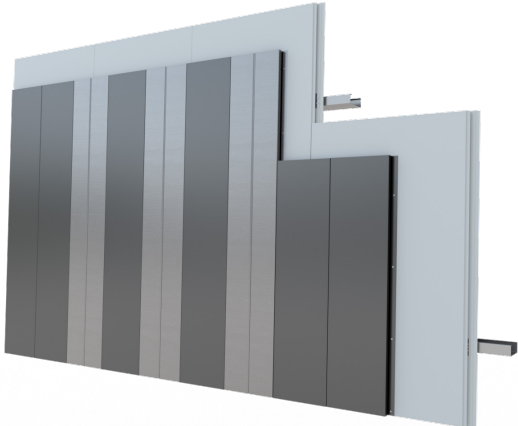


DESIGN GUIDE

Performance-Driven Backup Wall System for Lasting Protection



Your vision. Our purpose.



Procedure for FASSADE Backup Assembly

OBJECTIVE

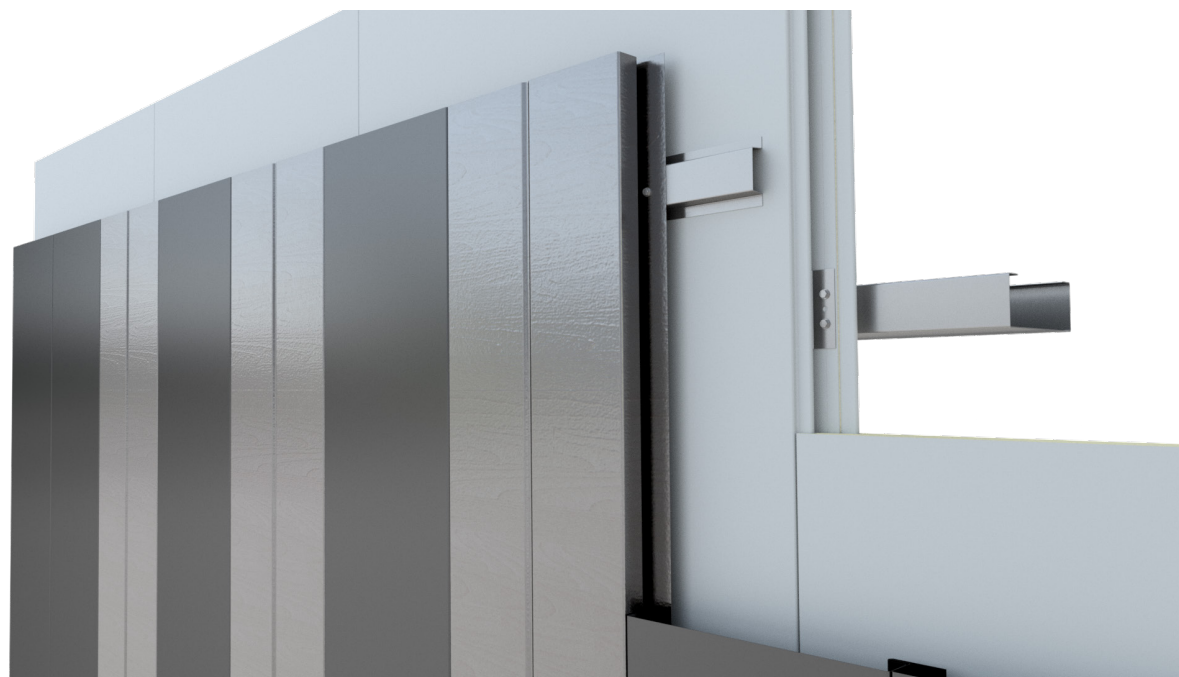
This design guide will highlight the steps required to determine the design requirements and attachment parameters for AWIP FASSADE™ insulated metal panels (IMPs) and single-skin metal wall cladding assemblies.

BACKGROUND

The All Weather Insulated Panels FASSADE provides a versatile integration solution for a wide range of single-skin metal panels, offering an architectural appearance that suits various building aesthetics. These insulated metal panels, specifically the FW40 panel, fulfill both insulation and vapor barrier functions, and allow for flexible vertical or horizontal installation. Single-skin metal panels from any manufacturer can be attached using hat channels fastened into the tongue and groove joint of the FW40 panel or directly attached to the exterior facing of the FW40 panel. In addition, Bellara Steel Siding products can be attached directly into the tongue and groove joint of the FW40 panels or directly attached to the exterior facing of the FW40 panel. This insulated wall system is specifically

designed to meet the rigorous thermal requirements for steel-framed walls, while preserving your ability to achieve your creative design aspirations.

There are several components to consider when designing a FASSADE assembly, including the overall design loads required for the project, the specific load capacity and the fastening span of the FW40, the attachment method of the single-skin metal panels to the FW40, and finally the specific load capacity and fastening spans of the single-skin metal panels. It is important to consider each component when evaluating the performance of the assembly. Each of these components will have their own limitations and the minimum design load will be the limiting factor in the FASSADE assembly.



Procedure for FASSADE Backup Assembly

PROCEDURE

1. Determine the Design Load Requirements for the Project.

The maximum design load required for the project will be the target design pressure in PSF that will determine specific details in each component of a FASSADE system. This will be the minimum load required for the components used.

1.1 Determine the wind load requirement for the specific building and application per local and national building code requirements.

1.2 Note the maximum allowable design load in PSF and proceed to the next step.

2. Maximum FW40 Panel Capacity and Span Calculation

The maximum span and attachment method of the FW40 panels is determined by the AWIP Load Span Table for FW40 Panels or AWIP job-specific calculations.

The load table provides design load and span information based on panel thickness, panel strength, connection strength, and deflection limits.

2.1 Use the overall design loads from Step 1.2 to determine the requirements for panel thickness, connection details, and panel spans. Note the maximum allowable design load in PSF for the selection of panel criteria; this design load must be equal or higher than the maximum design load calculated for the project.

3. Maximum Single-Skin Metal Panel Capacity Calculation

The maximum span and attachment method of the single-skin metal panel is determined by technical resources of the particular manufacturer. AWIP provides this guide as a basis for installation and connection to the FW40, but analysis of the single-skin metal panels is the responsibility of the Engineer of Record or the single-skin metal panel manufacturer.

The designer should check with the single-skin metal panel manufacturer for technical information or compatibility of their product in a FASSADE assembly.

3.1 Use the overall design loads from Step 1.2 to determine the allowable span for the single-skin metal panel, connection requirements, and substrate requirements. Note the maximum allowable design load in PSF or the maximum allowable span for the selection of single-skin metal panel; this design load must be equal or higher than the maximum design load calculated for the project in Step 1.

4A. Option 1: Hat Channel Fastening System

The first method to install single-skin metal panels is through a hat channel fastening system. Steel hat channels are used in this application to allow a higher gauge substrate for fasteners to attach in accordance with the single-skin metal panel requirements. Hat channels must always be installed perpendicular to the both the FW40 and single-skin metal panel installation direction.

4A.1 Determine the spacing and load limitations of the Hat Channel System by using the table below. Other parameters and limitations for the Hat Channel System are specified in Hat Channel Fastening System Design Parameters section of this document. The table below provides the allowable load and spacing for the hat channels to be used in a FASSADE assembly. The strength and shape of the hat channel shall be designed by the Engineer of Record for the project.

Note that the single-skin metal panel capacity and spacing obtained in Step 3.1 must correlate with the spacing as determined in the table.

Procedure for FASSADE Backup Assembly

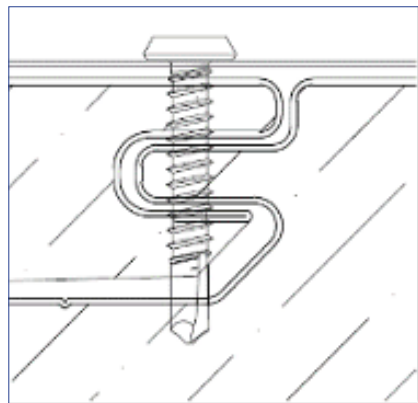
| Hat Channel Attachment | | | | | | | |
|------------------------|----|-----|----|-----|----|-----|----|
| Spacing (ft) | 2 | 2.5 | 3 | 3.5 | 4 | 4.5 | 5 |
| Loading (PSF) | 75 | 60 | 50 | 43 | 37 | 33 | 30 |

Notes:

1. FW40 panel properties for hat channel attachment are based on **26 gauge exterior** and **26 gauge** interior facings.
2. Hat channel must be installed through the tongue and groove joinery of FW40.
3. Hat channel connection is based on ¼-13 x 1.5" long DP1 fasteners applied to each flange of the channel at the panel joint location.
4. Hat channels must run perpendicular to the panel joint.
5. Safety factor = 2.0 for connection strength.
6. Allowable loads are applicable to vertical or horizontal panel installation.

PROCEDURE (CONT.)

4A.2 With the hat channel spacing determined, the hat channels can be installed onto the panels by fastening through the FW40 tongue and groove joint. The hat channel must always be installed perpendicular to the direction of the FW40 panels using two fasteners per FW40 joint. One fastener shall be installed to each hat channel flange. The fasteners must penetrate through the tongue and groove joint as shown below.



4A.3 The single-skin metal panels can be installed directly into the hat channels once they are secured to the FW40 panel.

4A.4 The connection, including clip, quantity, and type of fasteners required for the single-skin metal panel installed into hat channels is specified by the single-skin metal panel supplier and is determined in Step 3 selecting and designing single-skin panel profile.

4B. Direct-Fastening System

The second method to install single-skin metal panels is direct-fastening to the exterior facing of the FW40 panel. This provides more flexibility in the location of fasteners for the single-skin metal panels. In the direct-fastening method, the exterior facing of the FW40 must be 22 gauge for direct-fastening installation. The direct-fastening method has a maximum allowable load regardless of the design capacity of the single-skin metal panel system and its fasteners.

Maximum Allowable Load = 75 PSF
Maximum Load Per Fastener = 100 lbs

4B.1 The single-skin metal panels can be installed directly onto the exterior facing of the FW40 panels with spacing as determined by the manufacturer details in Step 3. Other parameters and limitations for the direct fastening method are specified in Direct-Fastening System Design Parameters section of this document.

Procedure for FASSADE Backup Assembly

HAT CHANNEL FASTENING SYSTEM DESIGN PARAMETERS



| Insulated Metal Panel Parameters | |
|----------------------------------|---|
| Profile | Exterior: flat |
| | Interior: mesa or flat |
| Embossing | Exterior: standard embossing or non-embossed |
| | Interior: standard embossing or non-embossed |
| Gauge | Exterior: 26, 24, 22 gauge |
| | Interior: 26, 24, 22 gauge |
| Width | 40" |
| Thickness | 2", 2.5", 3", 4", 5", 6", 8* |
| Length | 8' - 50' |
| Orientation | Vertical and Horizontal (hat channel always perpendicular to the direction of the IMPs) |

* 8" available in U.S. market only

| Hat Channel Design Parameters | |
|--|-------------------------------|
| Minimum Thickness | 17 gauge |
| Maximum Spacing | AWIP Calculator or Load table |
| Maximum Load (2 fasteners into joint) | 500 lbs. |

| Single Skin Metal Design Parameters | |
|-------------------------------------|----------|
| Minimum Thickness | 26 gauge |

Procedure for FASSADE Backup Assembly

DIRECT FASTENING SYSTEM DESIGN PARAMETERS



| Insulated Metal Panel Parameters | |
|----------------------------------|--|
| Profile | Exterior: flat |
| | Interior: mesa or flat |
| Embossing | Exterior: standard embossing or non-embossed |
| | Interior: standard embossing or non-embossed |
| Gauge | Exterior: 22 gauge |
| | Interior: 26, 24, 22 gauge |
| Width | 40" |
| Thickness | 2", 2.5", 3", 4", 5", 6", 8" |
| Length | 8' - 50' |
| Orientation | Vertical and Horizontal |

* 8" available in U.S. market only

| Single Skin Metal Design Parameters | |
|--------------------------------------|---|
| Minimum Thickness | As required by single-skin panel manufacturer |
| Maximum Fastener Line Spacing | AWIP Calculator |
| Maximum Load per Fastener | 100 lbs. |

Procedure for FASSADE Backup Assembly with Bellara

FASSADE WITH BELLARA INSTALLATION METHODS



5. Bellara Steel Siding Capacity Calculation

Bellara Steel Siding profiles have been specifically qualified with AWIP FW40 panels and have more specific design details. The maximum span and attachment method of the Bellara Steel Siding is determined by FASSADE with Bellara Allowable Load Tables or AWIP job-specific calculations.

The load table includes Bellara and FW40 gauge requirements, fastener spacing, and allowable loads.

5.1 Use the overall design loads from Step 1.3 to determine the minimum gauge for the Bellara Steel Siding, the minimum gauge for the exterior facing of the FW40 panel and the Bellara fastener spacing. The selected FW40 gauge must correlate with the requirements determined in Step 2. Note the maximum allowable design load in PSF for the selection of Bellara; this design load must be equal or higher than the maximum design load calculated for the project in Step 1.

5A. Bellara Option 1: Joint Attachment Fastening System

The first method to install Bellara is into the tongue and groove joint of the FW40 panel. This option is typically used for when the FW40 panel exterior facing is 26 ga or 24 ga. The Bellara profiles must always be installed perpendicular to the panel installation direction in this scenario.

5A.1 Determine the Bellara Steel Siding lengths so that the siding terminates at the FW40 panel joints. Using the spacing and fastener requirements obtained in Step 5.1, install the Bellara fasteners at every FW40 tongue and groove joint as required. Other parameters and limitations for the Bellara joint attachment method are specified in Bellara Joint Attachment Design Parameters section of this document.

5A.2 The fasteners must penetrate through the tongue and groove joint.

5A.3 The specific Bellara installation instructions or project-specific shop drawings will show the fastening and trim details.

Procedure for FASSADE Backup Assembly with Bellara

FASSADE WITH BELLARA INSTALLATION METHODS (CONT.)

5B. Bellara Option 2: Direct Attachment Fastening System

The second method to install Bellara Steel Siding is direct-fastening to the exterior facing of the FW40. This provides more flexibility in the location of fasteners for the single-skin metal panels. In the direct-fastening method, the exterior facing of the FW40 must be 22 gauge for direct-fastening installation.

5B.1 Using the spacing and fastener requirements obtained in Step 5.1, install the Bellara Steel Siding with fasteners directly into the FW40 panel exterior facing. Other parameters and limitations for the Bellara direct-attachment fastening system are specified in Bellara Direct Fastening System Design Parameters section of this document.

5B.2 The specific Bellara installation instructions or project-specific shop drawings will show the fastening and trim.

Procedure for FASSADE Backup Assembly with Bellara

FASSADE with Bellara Allowable Load Table (PSF) for Three or More Spans

| Attachment of Bellara Steel Siding to a FW40 Panel | | | | |
|--|---------------|---------------------|---------------------------------|----------------------|
| Bellara Product | Bellara Gauge | FW40 Exterior Gauge | Fastener Spacing | Allowable Load (psf) |
| Plank 90 | 26 gauge | 26 gauge | 40" o/c attached to panel joint | 57 |
| | 24 gauge | 26 gauge | 40" o/c attached to panel joint | 84 |
| | 26 gauge | 22 gauge | 16" o/c attached to panel face | 111 |
| | 24 gauge | 22 gauge | 16" o/c attached to panel face | 155 |
| Plank 135 | 26 gauge | 26 gauge | 40" o/c attached to panel joint | 44 |
| | 24 gauge | 26 gauge | 40" o/c attached to panel joint | 69 |
| | 26 gauge | 22 gauge | 16" o/c attached to panel face | 89 |
| | 24 gauge | 22 gauge | 16" o/c attached to panel face | 132 |
| Plank 200 | 26 gauge | 26 gauge | 40" o/c attached to panel joint | 24 |
| | 24 gauge | 26 gauge | 40" o/c attached to panel joint | 46 |
| | 26 gauge | 22 gauge | 16" o/c attached to panel face | 57 |
| | 24 gauge | 22 gauge | 16" o/c attached to panel face | 80 |
| Board & Batten 140 | 26 gauge | 26 gauge | 40" o/c attached to panel joint | 40 |
| | 26 gauge | 22 gauge | 16" o/c attached to panel face | 111 |
| Board & Batten 260 | 26 gauge | 26 gauge | 40" o/c attached to panel joint | 36 |
| | 26 gauge | 22 gauge | 16" o/c attached to panel face | 58 |
| Lap Siding 155 | 26 gauge | 22 gauge | 16" o/c attached to panel face | 102 |

Notes:

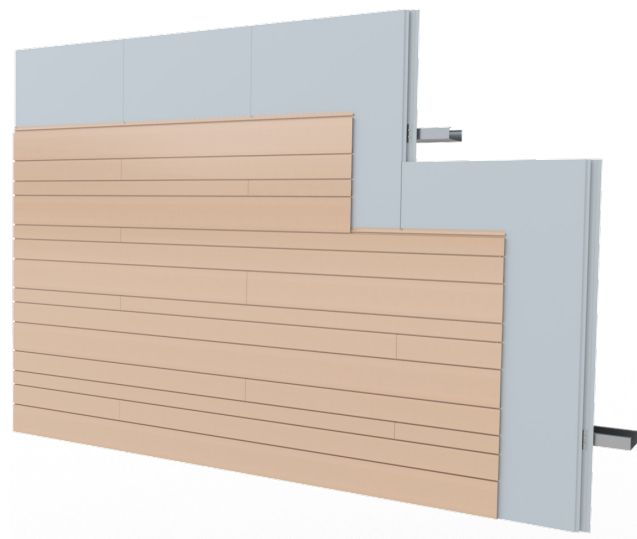
1. Load span table is based on Allowable Stress Design (ASD).
2. Table is based on values derived from transverse load testing per ASTM E72, ASTM E1592, and strength of fasteners.
3. Bellara properties shown for **26 gauge** and **24 gauge**. FW40 Wall Panel properties are based on 26 gauge and 22 gauge exterior.
4. 40" o/c fastens into the panel joint using #10 x 1 1/2" self-drilling pancake head fasteners.
5. 16" o/c fastens into the panel face using #10 x 3/4" self-drilling pancake head fasteners.
6. Please see the FL40 load table for FW40 allowable loads, spans and fastening.

Procedure for FASSADE Backup Assembly with Bellara

Notes (cont.):

- 7. Allowable loads are applicable to vertical or horizontal panel installation. Bellara and AWIP Wall Panels must be perpendicular to each other.
- 8. Structural design of wall supports has not been considered and must be designed the support professional.
- 9. Thermal effects from controlled environment and cold storage applications have not been considered.
- 10. Consult your AWIP representative for project specific calculations.
- 11. Load tables are subject to change without notice - visit www.awipanel.com for the latest information.

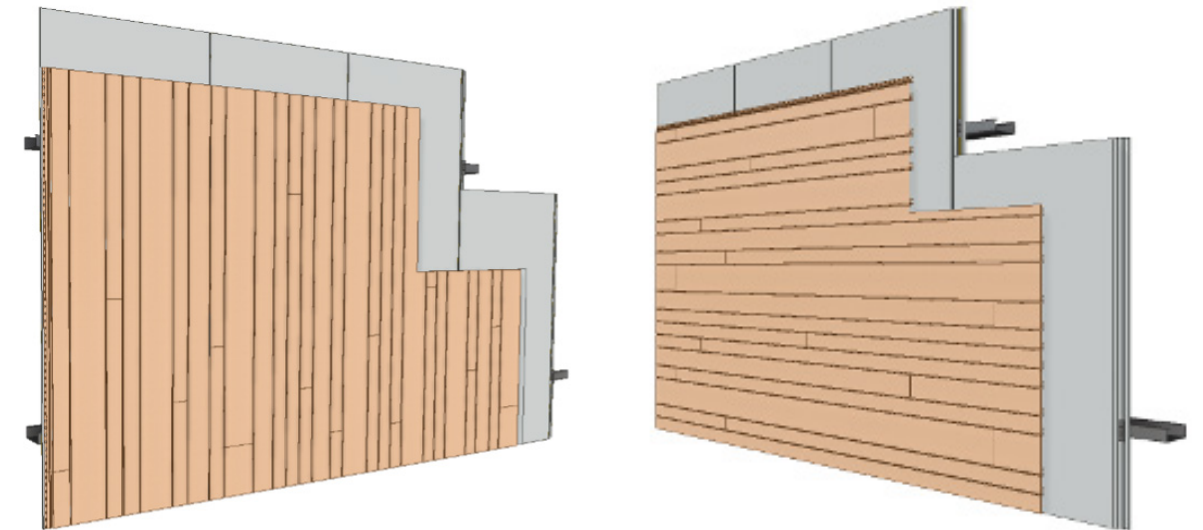
FASSADE with Bellara Tongue and Groove Joint Attachment Design Parameters



| Insulated Metal Panel Parameters | |
|----------------------------------|--|
| Profile | Exterior: flat |
| | Interior: mesa or flat |
| Embossing | Exterior: non-embossed |
| | Interior: standard embossing or non-embossed |
| Gauge | Exterior: 26 gauge standard, 24 and 22 gauge optional |
| | Interior: 26, 24, 22 gauge |
| Width | 40" |
| Thickness | 2", 2.5", 3", 4", 5", 6" |
| Length | 8' - 50' |
| Orientation | Vertical and Horizontal (Bellara Steel Siding must always be installed perpendicular to the direction of the FW40 panel) |

Procedure for FASSADE Backup Assembly with Bellara

FASSADE with Bellara Direct-Fastening System Design Parameters



| Insulated Metal Panel Parameters | |
|----------------------------------|--|
| Profile | Exterior: flat |
| | Interior: mesa or flat |
| Embossing | Exterior: non-embossed |
| | Interior: standard embossing or non-embossed |
| Gauge | Exterior: 22 gauge |
| | Interior: 26, 24, 22 gauge |
| Width | 40" |
| Thickness | 2", 2.5", 3", 4", 5", 6" |
| Length | 8' - 50' |
| Orientation | Vertical and Horizontal |

| Single Skin Metal Design Parameters | |
|--------------------------------------|-----------------|
| Minimum Thickness | 26 gauge |
| Maximum Fastener Line Spacing | AWIP Load Table |
| Maximum Load per Fastener | 100 lbs. |



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awipanel.com
sales@awipanel.com



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