NOTE TO THE SPECIFIER: This section is a proprietary specification with strict requirements for approved alternates. Prior to incorporation into Project Manual delete Notes to the specifier or change Style of Notes to the specifier to ‘Hidden’

NOTE TO THE SPECIFIER: The ACS Thermal Clip is a fabricated stainless steel with integral thermal breaks engineered and tested component to be used in the building envelope assembly to improve the effective thermal performance of exterior wall assemblies and aid in compliance with ASHRAE 90.1 (2007, 2010, 2013, 2016) and NECB (2001 and 2015).

There are two versions of the ACS Thermal Clips

ACS A - Clip®; adjustable.

ACS S - Clip®; fixed (non-adjustable)

# General

This section is written for a Stipulated Price form of contract. Adjust specification to suit other forms of contracts and project delivery systems.

## Summary

### Work of this section includes provision of the following:

#### Manufactured, structural, thermally isolated, cladding supports.

#### Sub-girt system.

#### Engineering by Sub-Contractor.

NOTE TO THE SPECIFIER: The variables inherent in the design of exterior cladding include building height, exposure, design wind pressure, cladding weight, cladding flexibility/brittleness, thermal clips, depth of assembly, substructure construction tolerances, substructure material type. For these reasons engineering by the Sub-Contractor would be required as a Delegated Design encompassing all structural components of the assembly. Review the ‘Structural Guide for the ACS Thermal Clip’ for more in-depth information.

## RELATED Requirements

### Section 05 41 00 - Structural Metal Stud Framing

### Section 06 10 00 - Rough Carpentry

### Section 06 16 43 - Gypsum Sheathing

### Section 07 21 13 - Board Insulation

### Section 07 21 29.03 – Sprayed Insulation – Polyurethane Foam

### Section 07 27 13 - Modified Bituminous Air and Vapour Barrier

## REFERENCES

### American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)

#### ASHRAE 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings.

### American Society for Testing and Materials International (ASTM)

#### ASTM A653/A653M-[17], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

#### ASTM A792/A792M‑[10(2015)], Standard Specification for Steel Sheet, 55% Aluminum‑Zinc Alloy‑Coated by the Hot‑Dip Process

#### ASTM C518-[17], Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

#### ASTM C1363-[11], Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.

#### ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

### Canadian Standards Association (CSA)

#### CSA A440.2-14/A440.3-14, Fenestration energy performance/User guide to CSA A440.2-14, Includes Update No. 1 (2015)

#### CAN/CSA S136‑12 Package, North American Specification for the Design of Cold Formed Steel Structural Members and S136.1-12 - Commentary on North American specification for the design of cold-formed steel structural members, Includes Update No. 1 (2014), Update No. 2. (2014), Update No. 3 (2015).

### International Code Council

#### ICC-ES AC359, Acceptance Criteria for Exterior Wall Coverings of Steel-Backed Veneer Panels Attached to Walls Utilizing Steel Framing and Brackets, Approved October 2008 – Section 3.8.2 Gravity Loads

### National Fenestration Rating Council Incorporated:

#### ANSI/NFRC 100 – Procedure for Determining Fenestration Product U-Factors

## ADMINISTRATIVE REQUIREMENTS

### Coordination:

#### Coordinate Work of this Section with installation of gypsum sheathing board, sheathing membrane, insulation and cladding.

#### Sequence work so that installation of cladding and support framing coincides with installation of substrate preparation without causing delay to Work.

### Convene pre-installation meeting one week prior to beginning work of this Section and on-site installation, with Contractor, Consultant, Sub-Contractor’s engineer, installer, manufacturer’s representative to:

#### Verify project requirements.

#### Review installation and substrate conditions.

#### Co-ordination with other building subtrades.

#### Review manufacturer's installation instructions [and warranty requirements].

### Manufacturer’s representative shall also provide frequent inspection visits during the course of work of this Section to assure quality and competence of panel installation.

## SUBMITTALS

### Provide submittals in accordance with Section [01 33 00 – Submittals].

### Product Data:

#### Submit manufacturer's printed product literature

#### Submit manufacturer's specifications

#### Submit manufacturer's datasheets including thermal modelling reports and hot box test reports.

#### Testing validating accuracy of thermal modeling.

#### Submit WHMIS MSDS ‑ Material Safety Data Sheets acceptable to Labour Canada, and Health and Welfare Canada.

### Shop drawings:

#### Indicate layout, profiles and product components including anchorage, accessories, finish colours and textures.

#### Include details showing thickness and dimensions of the various system parts, fastening and anchoring methods, locations of joints and gaskets and location and configuration of movement joints.

#### Shop drawings are to be engineered and stamped by a Professional Engineer licensed to practice in project jurisdiction.

### Manufacturer's Instructions:

#### Submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

### Manufacturers' Field Reports: Submit copies of manufacturers field reports.

### Structural engineering:

#### Submit Contractor’s structural engineer's design notes and calculations upon request of Consultant.

NOTE TO THE SPECIFIER: Review Provincial requirements governing delegated design engineering and modify sub-paragraph below to suit.

#### Delegated Design; submit Letter of Commitment and Letter of Compliance requiring compliance with requirements of Building Code.

NOTE TO THE SPECIFIER: Select both sentences below for use in British Columbia.

#### [Provide Schedules S-B and S-C to Consultant (CRP – Coordinating Registered Professional).]

#### [Field Review Reports: provided by professional engineer providing Schedules S-B and S-C.]

NOTE TO THE SPECIFIER: Select second sentence below when specific thermal performances have been listed as a requirement in Performance Criteria of Part 2.

### Acknowledgement of Thermal Compliance:

#### Submit modelling demonstrating project specific exterior wall type assemblies.

#### Modelling and values must demonstrate overall effective R-Value for entire wall assemblies of project.

#### Where a manufacturer's existing published thermal modeling report aligns with the project specific wall assemblies the manufacturer's data may be accepted in lieu of a project specific modeling report.

#### [Submit engineer sealed letter demonstrating the thermal performance requirements outlined in Performance Criteria of this section have been achieved.]

### Structural and thermal modelling submittals shall bear the seal of a professional engineer registered in Province of the Work.

### Quality assurance submittals:

#### Test Reports: submit manufacturer’s certified test reports showing compliance with specified performance characteristics and physical properties.

#### Certificates: submit certificates signed by manufacturer certifying that composite wall panels comply with specified performance characteristics and physical properties.

## QUALITY ASSURANCE

### Installer Qualifications: Engage experienced installer with a minimum of 5 years experience who has completed systems similar in material, design, and extent to that indicated for Project and with record of successful performance and is approved by manufacturer.

### Retain a professional structural engineer, registered in the province of the Work, to design fabrication and erection of the Work of this Section in accordance with applicable Building Code and Contract Document requirements including, but not limited to, the following:

#### Seal and signature to shop drawings and design submittals requiring structural engineering.

#### Field review of installed components.

### Retain a professional engineer registered in province of the Work to conduct thermal modelling of building envelope assembly.

### Mock-ups: Construct mock‑up as specified in Section 01 45 00 Quality Control.

#### Provide mock-up for evaluation of assembly and workmanship.

#### Construct mock‑up in coordination with those mock-ups of Related Requirements.

#### Include relationship between wall panels, flashing, sheathing membrane, insulation, cladding, framing for glazing, and doors.

#### Co-ordinate type and location of mock-ups with project requirements.

#### Remove and replace units which are not accepted.

#### Do not proceed with remaining work until workmanship, has been reviewed by Consultant and written authorization of Consultant has been granted.

#### When accepted, mock-up will demonstrate minimum standard of quality required for this work.

#### Approved mock-up may remain as part of finished work.

## DELIVERY, STORAGE AND HANDLING

### Deliver, store and protect material in accordance with panel manufacturer's recommendations.

## WASTE MANAGEMENT AND DISPOSAL

### Separate waste materials for recycling and disposal in accordance with Division 01 Requirements.

# Products

## MANUFACTURERS

### Acceptable Manufacturers:

#### ACS Composite Systems Inc.

## PERFORMANCE/DESIGN CRITERIA

### Design to incorporate requirements for dead and live loading including seismic loading as follows:

#### Snow (S), Wind (W), [and Earthquake (E)] loads as identified in [National Building Code] [BC Building Code] [Provincial Building Code].

#### System to withstand imposed axial load, lateral loads and wind loads. Wind load minimum [100] km/hr.

### Design to incorporate exterior wall components including:

#### Thermally improved cladding support system,

#### Fastening of insulation,

#### Sub-structure, components.

#### Cladding.

#### Fasteners and methods of fastening exterior wall assembly components.

### Design and install cladding system to allow for thermal movement of local climate with at least 60 degrees C ambient or panel temperature fluctuations, without causing undue stress on fasteners or panel or other detrimental effects.

### Design to accommodate, by means of control joints, movement in wall system and between wall system and building structure, caused by structural movements, without permanent distortion, damage to in fills or racking of joints.

NOTE TO THE SPECIFIER: Use this Article when the assembly is listed and project has a specific value for RSI. Below is an example of one type of assembly. Modify as required for project.

### Inclusive of Thermal Clip spaced at [400] mm o/c horizontal and [600] mm o/c vertical, thermal performance of assemblies outlined below to be demonstrated through thermal modelling.

#### Exterior Insulated Framed Wall Assembly – RSI [x.xx]

##### 12.7 mm gypsum wall board

##### [152] mm steel studs at [400] [600] mm o/c

##### 15.9 mm exterior rated gypsum sheathing

##### Fully adhered SBS membrane (Air/Vapour/Moisture Barrier)

##### [152] mm thermally improved cladding support clips – spacing to be [400] [600] mm o/c horizontally, [ ] mm o/c vertically

##### [ ] mm rigid, semi rigid insulation or sprayed polyurethane foam

##### Vertical furring channels for cladding attachment (drainage cavity)

##### [Cladding type]

## Materials

### Thermally improved cladding support units:

NOTE TO THE SPECIFIER: select either adjustable or fixed, or both depending on project conditions.

#### Description: engineered and fabricated 16-18 ga stainless steel [adjustable] [fixed/non-adjustable] with integral thermal break material on both inside and outside faces.

#### Independent Structural Testing as follows:

##### To ASTM E330/E330M-14, Standard Test Method for Structural Performance.

##### ICC-ES AC359, Acceptance Criteria for Exterior Wall Coverings of Steel-Backed Veneer Panels Attached to Walls Utilizing Steel Framing and Brackets, Approved October 2008 – Section 3.8.2 Gravity Loads

#### Confirmation of Thermal Performance:

##### Thermal evaluation performed using 2D or 3D heat transfer software simulating entire wall assembly (face to face).

##### Physical Testing to ASTM 1363 Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.

NOTE TO THE SPECIFIER: the two products below can be used in the same system together or select one or other depending on project requirements.

#### Products:

##### ACS A-Clip® - by ACS Composite Systems Inc.

NOTE TO THE SPECIFIER: ACS-A Clip is designed to be adjustable, allowing installer to create an accurate plane for receiving the specified cladding. With the ACS-A Clip, after attaching the inner leg to the building, the outer leg is slid over the inner leg, to the desired plane, and then fixed by installing two screws through both the inner and outer webs­

##### ACS-S Clip® – by ACS Composite Systems Inc.

NOTE TO THE SPECIFIER: ACS-S Clip is a fixed (non-adjustable) z-clip thermally similar to the ACS-A Clip, but may be used where construction tolerances are small enough in the wall plane to not be an issue for the proposed cladding assembly

NOTE TO THE SPECIFIER: Use alternates only on projects where sole sourcing is not permitted such as for publicly funded projects.

## Accessory materials

### Metal Z-girts: profile and size as indicated on drawing, Galvalume to ASTM A792, AZM150 coating, 1.2 mm (18 ga.) thickness, notched or perforated for drainage if placed horizontally.

### Insulation Stickpins: stainless steel.

### Fasteners for thermally improved cladding support system:

NOTE TO THE SPECIFIER: DT2000 fasteners by Leland come with a high-corrosion resistant coating. Specify either DT2000 or stainless steel series 316 fasteners. Under no circumstances should zinc plated fasteners be used.

#### Concrete: minimum 14-15 concrete screws (6 mm diam.), hex head, DT®2000 coated, length to penetrate minimum 38 mm unless otherwise determined by Sub-Contractor’s engineer; fasteners by Leland Industries or approve alternate.

#### [Steel stud framing: hex head DT®2000, size as engineered; fasteners by Leland Industries or approve alternate.]

#### [Wood stud framing: hex head DT®2000, size as engineered; fasteners by Leland Industries or approve alternate.]

#### [Stainless steel series 316].

### Cavity behind cladding: [Minimum 12.7mm of unrestricted space.]

### Insect/Vent Screen:

#### Continuous screen located at top and bottom of cladding system, where opening is minimum 19 mm wide, with minimum 50% free air flow.

# Execution

## MANUFACTURER'S INSTRUCTIONS

### Compliance:

#### Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

#### Comply with engineered shop drawings.

## Examination

### Obtain dimensions from job site.

### Ensure metal framing is aligned and condition is acceptable.

### Building surfaces shall be smooth, clean and dry, and free from defects detrimental to the installation of system. Notify Consultant of conditions not acceptable for installation of system.

### Inspect components before installation and verify that there is no shipping damage.

### Do not install damaged material.

### Verify site dimensions by accurate field measurements so that work will be accurately designed, fabricated and fitted to the structure.

### Verify flashings are in place.

### Maintain sheathing membrane integrity.

## INSTALLATION

### Install components in accordance with manufacturer's written instructions and engineered shop drawings.

### Install insulation tightly to adjacent components with no gaps. Install insulation using stainless steel stickpins.

## FIELD QUALITY CONTROL

NOTE TO THE SPECIFIER: Co-ordinate with Submittals as specified below. If no field inspections are required, delete the following paragraph.

### [Professional engineer responsible for design of work of this section shall perform periodic field reviews and submit field review reports.]

## CLEANING

### Progress Cleaning: Leave work area clean at the end of each workday.

### Final Cleaning: At completion of installation, clean all surfaces so they are free of foreign matter using cleaners recommended by material manufacturer.

END OF SECTION