

# Sound Wall Silent Protector™

## 3 Part American Specification

Master Specification  
May 2013

SOUND BARRIERS  
SECTION 32 35 16  
P. 1 of 10

SPEC NOTE: This master specification section includes AIL SOUND WALLS SPEC NOTES for information purposes and to assist the architect / specification writer in making appropriate decisions. AIL SOUND WALLS SPEC NOTES always immediately precedes the text to which it is referring. The section serves as a guideline only and should be edited with deletions and additions to meet specific project requirements.

SPEC NOTE: This specification section follows the recommendations of the Construction Specifications Institute, Manual of Practice including MasterFormat, SectionFormat, and PageFormat. Optional text is indicated by square brackets [ ]; delete the optional text including the brackets in the final copy of the specification. Delete all SPEC NOTES in the final copy of the specification.

### PART 1:GENERAL

#### 1.1 SUMMARY

- .1 This Section includes requirements for supply and installation of rooftop and/or ground sound barriers, complete with attachment brackets as shown on drawings, as specified and as required for complete and proper installation.
- .2 Furnish sound barriers to include the following:
  - .1 Structural Steel Framing
  - .2 Sound Barrier Wall Components complete with Sound Absorptive Material

#### 1.2 RELATED REQUIREMENTS

SPEC NOTE: Include in this paragraph only those sections and documents that directly affect the work of this section. Do not include Division 00 Documents or Division 01 Sections since it is assumed that all technical sections are related to all project Division 00 Documents and Division 01 Sections to some degree. Refer to other documents with caution since referencing them may cause them to be considered a legal part of the Contract. Edit the following paragraphs to suit specific project conditions.

- .1 Section 03 30 00 - Cast-In-Place Concrete
- .2 Section 05 12 00 - Structural Steel Framing
- .3 Section 05 50 00 - Metal Fabrications
- .4 Section 06 10 00 - Rough Carpentry
- .5 Section 07 50 00 - Membrane Roofing
- .6 Section 07 62 00 - Sheet Metal Flashing and Trim
- .7 Section 07 92 00 - Joint Sealants

### 1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
  - .1 ASTM A123/A123M-12, Standard Specification for Zinc (Hot-Dipped Galvanized) Coating or Iron and Steel Products
  - .2 ASTM A449-10, Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use
  - .3 ASTM A563-07a, Standard Specification for Carbon and Alloy Steel Nuts
  - .4 ASTM A992/A992M-11, Standard Specification for Structural Steel Shapes
  - .5 ASTM A1011/A1011M-12b, Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with improved Formability, and Ultra-High Strength
  - .6 ASTM C423-09a, Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
  - .7 ASTM C939-10, Standard Test Method for Flow of Grout for Preplaced Aggregate Concrete (Flow Cone Method)
  - .8 ASTM C1107/C1107M-11, Standard Specification for Packaged Dry, Hydraulic Cement Grout (Nonshrink)
  - .9 ASTM D2565-99(2008), Standard Practice for Xenon Arc Exposure of Plastics Intended for Outdoor Applications
  - .10 ASTM E90-09, Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
  - .11 ASTM E795-05(2012), Standard Practices for Mounting Test Specimens During Sound Absorption Tests
  - .12 ASTM F436-11, Standard Specification for Hardened Steel Washers
- .2 American National Standards Institute/American Welding Society:
  - .1 ANSI/AWS D1.1, Structural Welding Code - Steel.
  - .2 ANSI/AWS D1.3, Structural Welding Code - Sheet Steel.
- .3 American Association of State Highway and Transportation Officials (AASHTO)
  - .1 AASHTO-Guide Specification for Structural Design of Sound Barriers
  - .2 AASHTO-LRFD Bridge Design Specifications
- .4 American Society of Civil Engineers (ASCE)
  - .1 ASCE 7-05, Minimum Design Loads for Buildings and Other Structures

### 1.4 ADMINISTRATIVE REQUIREMENTS

- .1 Coordination: Coordinate the Work of this Section with the installation of base plate.
  - .1 Sequence work so that installation of sound barriers coincides with installation of HVAC equipment and substrate without causing delay to the Work.
- .2 Pre-Construction Conference: Arrange a site meeting attended by the Contractor, the Subcontractor, the Consultant, materials supplier(s), and other relevant personnel prior to commencement of work for this Section; as indicated in Section 01 31 13 Project Meetings.
  - .1 Review methods and procedures related to installation, including manufacturer's written instructions;
  - .2 Examine substrate conditions for compliance with manufacturers installation requirements;
  - .3 Review temporary protection measures required during and after installation.

### 1.5 SUBMITTALS

- .1 Provide requested information in accordance with Section 01 33 00 Submittals Procedures.

- .2 Action Submittals: Provide the following submittals before starting any work of this Section:
  - .1 Product Data: Submit manufacturer's data sheets covering the care and recommended maintenance procedures for incorporation into maintenance manuals.
  - .2 Shop Drawings:
    - .1 Submit shop drawings of sound barrier system components, substrate materials, layout, corner and edge details, base plate anchorage details, foundation details and accessories to the Consultant for review.
  - .3 Delegated Design Submittals: Furnish complete design calculations and details, fabrication and erection shop drawings and site review for sound barriers, bearing the seal of a Professional Engineer registered in the State of the Work, in accordance with applicable Building Code and Contract Documents.
  - .4 Samples: Submit for approval 12" long sample lengths of each sound barrier wall component, complete with sound absorptive material, for verification of finish, Color and texture, prior to fabrication.
- .3 Information Submittals:
  - .1 Acoustical Requirements: Where applicable, submit test reports to confirm that the sound barriers have achieved the specified Sound Transmission Class (STC) and Noise Reduction Coefficient (NRC) performance characteristics outlined in this Section.

**SPEC NOTE:** Delete the following paragraph in its entirety if sustainable design submittals are not required as part of the Project.

**SPEC NOTE:** Add and/or remove items below to comply with LEED credits or prerequisites selected for the Project. After meeting the credit requirements, complete the required documentation for each credit.

**SPEC NOTE:** Consult the project team's designated LEED Accredited Professional if these or other credits are going to be pursued.

- .4 Sustainable Design Submittals: Coordinate project sustainable design requirements with Section 01 31 63 Sustainability Certification Project Requirements; in addition, provide information for following specific requirements of this Section:

**SPEC NOTE:** The paragraphs below indicate the lowest requirement to obtain each credit, resulting in one credit point. The second option, indicated in [ ] requires in higher values than option one but allows for an additional credit to be obtained. Edit each paragraph below to suit project requirements.

- .1 MR Credit 4.1[4.2] – Recycled Content:
  - .1 **Content:** Use building materials containing recycled content such that the sum of post-consumer recycled content plus 1/2 of the pre-consumer content is at least 10%[20%], based on cost, of the total value of the materials in the Project. The recycled content value of a material assembly is determined by weight.
  - .2 **Compliance Requirement:** Submit product cut sheet indicating post consumer and pre-consumer recycled content contained in products proposed for this project.
- .2 MR Credit 5.1[5.2] – Regional Materials:
  - .1 **Content:** Use building materials or products extracted, harvested, recovered and processed within 500 miles of the final manufacturing site, for which a minimum percentage of regional materials used on the project equals 20%[30%].
  - .2 **Compliance Requirement:** Submit evidence of delivery service and product data indicating compliance with regional materials extraction and manufacturing

requirements.

## 1.6 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: Submit manufacturer's written instructions for cleaning solutions, materials and procedures, include name of original installer and contact information in accordance with Section 01 78 23 Operation and Maintenance Data.
  - .1 Provide specific warning of any maintenance practice or materials that may damage or disfigure the finished Work.

## 1.7 QUALITY ASSURANCE

- .1 Qualifications: Provide proof of qualifications when requested by Consultant:
  - .1 Manufacturer / Supplier: Obtain materials from one source with resources to provide products from the same production run for each contiguous area of consistent quality in appearance and physical properties.
    - .1 Sound Barrier Panel Manufacturer: Minimum of ten (10) years experience in the manufacturing of sound barrier products.
    - .2 Design of Sound Barriers: Performed by a professional engineer licensed in the jurisdiction of the project and in accordance with local code requirements.
  - .2 Installers:
    - .1 Execute Work of this Section using qualified personnel skilled in installation of work of this Section, having a minimum of three (3) years proven experience of installations similar in material, design, and extent to that indicated for this Project.
    - .2 Conform to all local and provincial licensing and bonding requirements.
    - .3 Certified by the sound barrier manufacturer to have completed installation training for products listed in this Section.

SPEC NOTE: Mock-ups establish quality of the work for the materials indicated in this Section. Delete the following paragraph if the scope of work in this Section is minimal and a mock-up is not required.

## 1.8 MOCK-UPS

- .1 Mock-ups: Construct mock-ups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution in accordance with Section 01 45 00 Quality Control for mock-ups and as follows:
  - .1 Build mock-up of typical wall section, incorporating the panel and finish, support framing and anchoring.
- .2 Notify Consultant a minimum seven (7) days prior to mock-up construction.
- .3 Review and acceptance of mock-ups does not constitute approval of deviations from the Contract Documents contained in mock-ups unless Consultant specifically notes such deviations in writing.
- .4 Once reviewed by Consultant, acceptable mock-up can form a permanent part of the Work, and will form the basis for acceptance for the remainder of the project.
- .5 Remove and replace materials found not acceptable at no cost to Owner or Consultant.

## 1.9 DELIVERY, STORAGE AND HANDLING

- .1 Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers packaging with identification labels intact.
  - .1 At the time of delivery, visually inspect all materials for damage. Note any damaged boxes, crates, or louver sections on the receiving ticket and immediately report to the shipping company and the material manufacturer.
  - .2 Coordinate delivery and pier/anchor construction schedule to minimize interference with normal use of buildings adjacent to the project.
- .2 Storage: Store sound barrier materials raised off the ground and cover with a weather proof flame resistant sheeting or tarpaulin.
- .3 Handling:
  - .1 Materials shall be handled in accordance with sensible material handling practices and in such a way as to minimize bending and panel damage.
  - .2 Hoist panels as recommended by sound barrier manufacturer.

## 1.10 SITE CONDITIONS

- .1 Site Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings where sound barrier panels are indicated to around mechanical units and other construction.
- .2 Establish dimensions and proceed with fabricating sound barrier panels where field measurements cannot be made without delaying the work; allow for site trimming and fitting where required.
- .3 Ambient Conditions: Install materials outlined in this Section after completion of work by other Sections is complete, and all penetrations are watertight; to provide adequate dry, clean, level, and plumb surfaces for installation.

## 1.11 WARRANTY

- .1 Warrant the work of this section in accordance with manufacturer's warranty for a period of two (2) years from date of delivery of material and agree to repair or replace faulty materials which becomes evident during the warranty period without cost to the Owner and at the Owner's convenience.
  - .1 Warranty includes but is not limited to the following:
    - .1 Panel Finish; peeling or fading of the exterior finish on sound barrier panels.
    - .2 Panel Components; failure of PVC resin resulting in cracking.
    - .3 Sound Absorptive Material; deterioration of acoustical mineral wool.

## PART 2:PRODUCTS

### 2.1 MANUFACTURER

- .1 Materials Manufacturer: Sound barriers and accessories specified herein are manufactured by:

AIL Sound Walls, 3300 Pinson Valley Pkwy, Birmingham AL 35217

Phone: (866) 231-7867

Email: [info@ailsoundwalls.com](mailto:info@ailsoundwalls.com)

Website: [www.ailsoundwalls.com](http://www.ailsoundwalls.com)

## 2.2 MATERIALS

- .1 Sound Barrier Panel Extrusions: Polyvinyl Chloride (PVC) homopolymer, manufactured in a co-extruded manner using recycled virgin resins for the substrate and pure virgin resins for the cap stock.
  - .1 Cap stock (exterior layer): Contains UV TI02 to protect Colors from fading due to ultra violet rays from the sun.
- .2 Acoustic Mineral Wool Insulation:
  - .1 Unfaced, preformed mineral slag insulation in accordance with ASTM C 665 and ASTM C 553; rated non-combustible in accordance with ASTM E 136 and having a flame spread rating of 5 or less in accordance with ASTM E84 (UL 723).
  - .2 Square edges; thickness and height as required to fill sound barrier panels.
  - .3 Low water absorption, minimizing growth of fungi or mildew.
- .3 Structural Steel Sections and Steel Plate:
  - .1 New stock (not weathered or rusted); conform ASTM A992 or ASTM A572 Gr 50, hot rolled wide flange structural sections in accordance with shapes, sizes, details and method of connection as shown on drawings.
  - .2 All steel components to be hot dipped galvanized after fabrication in accordance with ASTM A123.
- .4 Sheet Steel (Structural Quality): Conforms to ASTM A1011.
- .5 Fasteners:
  - .1 Anchor Rods and Bolts: Conforms to ASTM A449.
  - .2 Heavy Hex Nuts: Conforms to ASTM A563.
  - .3 Hardened Washers: Conforms to ASTM F436.
- .6 Welding Materials: Conforms to American Welding Society D1.5.
- .7 Zinc Rich Paint For Touch-up of Galvanized Metals: Ready mixed, zinc-rich primer conforming to ASTM A123

## 2.3 COMPONENTS

SPEC NOTE: Select one of the following structural design components listed below:

SPEC NOTE: AASHTO LRFD Bridge Design Specification – 2012 or ASTM 1989 Guide Specification for Structural Design of Sound Barriers or IBC 2012 and American Society of Civil Engineers (ASCE).

- .1 Structural Requirement: Design components to wind maximum positive and negative pressures according to [*State required wind speed*] [ASCE 7-05].
- .2 Make provisions to accommodate thermal and structural movement, including building structural framing deflection and creep, in component parts of system and fastenings without detrimental effects.
- .3 Weather Testing: Average of test specimens shall show no change in Modulus of Rupture and a change of less than 3.5% in Modulus of Elasticity after 2000 hours when tested in accordance with ASTM D2565.

SPEC NOTE: Select one of the following Sound Barrier Panel Systems below.

SPEC NOTE: Specify an absorptive panel for project situations which require a higher STC rating, and would benefit from a NRC rating. Absorptive panels require additional manufacturing process which increase panel pricing when compared to the reflective panel system.

- .4 Absorptive Sound Barrier Panel Characteristics:
  - .1 Absorptive on one side of the panel with a perforated routing pattern.
  - .2 Acoustical mineral wool insulation inserted in panel cavity.
  - .3 Sound Transmission Class (STC) rating greater than or equal to 31, as per ASTM E90.
  - .4 Noise Reduction Coefficient (NRC) equal to 1.0, as per ASTM C423.
  - .5 Dimensions:
    - .1 Width: 2.7"
    - .2 Height: 5.96";  $\pm$  0.10"

SPEC NOTE: Consult with AIL Sound Walls to ensure stock lengths prior to selecting panel lengths for the project.

- .3 Length: 8' - 10' (nominal)
- .6 Finish:

SPEC NOTE: Smooth texture is the standard finished texture. Embossed texture is an extra cost.

- .1 Texture: [Smooth on both sides][Embossed wood grain on both sides].

SPEC NOTE: Select one of the following Color options and delete the remaining Color options not required on the project.

- .2 Color: [Gray][Adobe][Tan][Beige][White][As selected by the Consultant from the manufacturer's standard Color line]. Custom Colors available upon request.
- .7 Basis of Design Model: Silent Protector by AIL Sound Walls.
- .5 Reflective Sound Barrier Panel Characteristics:
  - .1 Solid, reflective on both sides of panel.
  - .2 Sound Transmission Class (STC) rating greater than or equal to 31, as per ASTM E90.
  - .3 Dimensions:
    - .1 Width: 2.7"
    - .2 Height: 5.96";  $\pm$  0.10"

SPEC NOTE: Consult with AIL Sound Walls to ensure stock lengths prior to selecting panel lengths for the project.

- .3 Length: 8' - 12' (nominal)
- .4 Finish:
  - .1 Texture: [Smooth on both sides][Embossed wood grain on both sides].

SPEC NOTE: Select one of the following Color options and delete the remaining Color options not required on the project.

- .2 Color: [Gray][Adobe][Tan][Beige][White][As selected by the Consultant from the manufacturer's standard Color line].



- .5 Basis of Design Model: Tuf Barrier by AIL Sound Walls.

## 2.4 ACCESSORIES

- .1 Steel Beam Covers:
  - .1 Extrusions: Polyvinyl Chloride (PVC) homopolymer, identical to panel construction, extruded to snap over face of structural steel beam.
  - .2 Finish: To match adjacent panel finish.

SPEC NOTE: Select one of the following Color options and delete the remaining Color options not required on the project.

- .3 Color: [To match adjacent panel Color][To match adjacent top and bottom panel Color][As selected by the Consultant from the manufacturer's standard Color line].

## PART 3:EXECUTION

### 3.1 EXAMINATION

- .1 Verification of Conditions:
  - .1 Examine areas to receive work and surrounding adjacent surfaces for conditions affecting installation. Coordinate with related sections providing supporting structure to ensure proper dimensions are maintained.
  - .2 Verify dimensions of supporting structure by accurate field measurements so that work will be accurately designed, fabricated and fitted to the structure.
  - .3 Verify base plate seat has been installed and elevations conform to the Shop Drawing requirements.
- .2 Notify Contractor in writing of any conditions that are not acceptable.
- .3 Proceed with installation after verification and correction of surface conditions acceptable to manufacturer.

### 3.2 INSTALLATION

- .1 Comply with manufacturer's instructions and recommendations for installation of the work, as shown on approved Shop Drawings.

SPEC NOTE: Select the following paragraph for Rooftop Sound Barrier System. Delete when not required on the Project.

- .2 Rooftop Sound Barrier Support Installation:
  - .1 Install anchor plates that are to receive steel post base plate connection to specified elevations indicated on approved Shop Drawings stamped by the Professional Engineer, prior to the installation of the sound barrier posts.
  - .2 Ensure all roof penetrations are water tight prior to the installation of sound barrier support posts.
  - .3 Anchor Bolts Tolerance:
    - .1 Anchor bolt location:  $\pm 1/16$ " from center of the specified location.
    - .2 Anchor bolt groups location: Within 6mm 1/4" of specified locations in all directions.
    - .3 Maximum accumulation: 3mm 1/8" per 15240mm 50' along the line of multiple



anchor groups but not to exceed a total of 25mm 1".

- .4 Steel Beams:
  - .1 Weld base plate to steel beams and bolt beam base plate to anchor plates.
  - .2 Install beams plumb to within  $\pm 3/8"$ .
  - .3 Locate beams at lines and grades as specified on the approved Shop Drawings.
  - .4 Snap on steel beam covers prior to installation of panels.
- .5 Panels:
  - .1 Place solid reflective panel as bottom course, inserting sound barrier panel within the flange of the steel beams.
  - .2 Install subsequent panels of either absorptive or reflective panels, as type and Color specified, with the tongue portion facing upwards and assembled tight to the lower panel.
  - .3 Mesh tongue and groove joins fully, be free from foreign material, and free of visible gaps.
  - .4 Place solid cap rail at top of sound barrier wall system.

SPEC NOTE: Select the following paragraph for Ground Sound Barrier System. Delete when not required on the Project.

- .3 Ground Sound Barrier Support Installation:
  - .1 Caisson Foundation: Excavated and cast directly against undisturbed soil unless otherwise directed by Professional Engineer.
  - .2 Concrete: As indicated in Section 03 30 00.
  - .3 Shape and level top of all footings to allow for horizontal seating of bottom panels. Slope remaining surface to allow for shedding of water.
  - .4 Anchor Bolts
    - .1 Anchor bolt location:  $\pm 1/16"$  from center of the specified location.
    - .2 Anchor bolt groups location: Within  $1/4"$  of specified locations in all directions.
    - .3 Hold cast anchor bolt location using steel template for a minimum of 24 hours after concrete has been placed.
    - .4 Maximum accumulation:  $1/8"$  per 50' along the line of multiple anchor groups but not to exceed a total of 1".
  - .5 Steel Beams:
    - .1 Weld base plate to steel beams and bolt beam base plate to anchors.
    - .2 Install beams plumb to within  $\pm 3/8"$ .
    - .3 Locate beams at lines and grades as specified on the approved Shop Drawings.
    - .4 Snap on steel beam covers prior to installation of panels.
  - .6 Panels:
    - .1 Place panel as bottom course, inserting sound barrier panel within the flange of the steel beams.
    - .2 Install subsequent panels of the type and Color specified with the tongue portion facing upwards and assembled tight to the lower panel.
    - .3 Mesh tongue and groove joins fully, be free from foreign material, and free of visible gaps.
    - .4 Place cap rail at top of sound barrier wall system.

### 3.3 TOLERANCES

- .1 Centerline of sound wall: Not more than  $3/8"$  from indicated plan location.

- .2 Beams: Plumb within 3/8" of required location.
- .3 Panels: Stacked, with a vertical tolerance of  $\pm 5/32$ ".

#### 3.4 CLEANING

- .1 Progress Cleaning: Leave work area clean at the end of each work day, ensuring safe movement of passing pedestrians.
- .2 Final Cleaning: At completion of installation, clean all surfaces so they are free of foreign matter using cleaners recommended by sound barrier manufacturer.
- .3 Remove and replace panels and beam covers damaged during installation and construction so no evidence remains of corrective work, at no additional cost to the Owner.
- .4 Waste Management: Coordinate recycling of waste materials and packaging at appropriate facility, diverting waste from landfill. Certified installer shall be responsible for ensuring waste management efforts are practiced.

END OF SECTION 32 35 16