

SECTION 13030

ACOUSTIC MODULAR BARRIER PANELS

PART 1 – GENERAL

1.1 SUMMARY

- A. Acoustic barrier assembled from 5” thick pre-manufactured components. Barrier is designed to meet performance criteria specified herein as a complete assembly.
- B. Provide labor, material, tools, equipment, scaffolding, transportation, inspection, certificates, and temporary protection necessary to:
 - 1. Provide Acoustical barrier as shown on Drawings and as specified in these Specifications. Provide accessories and appurtenances required for complete working installation.
 - 2. Connectors and flashing shall make holes in walls acoustically tight in accordance with panel manufacturer’s instructions.
- C. Structural steel support frame as required.
- D. Related Sections:
 - 1. Section 05120 – Structural Steel
 - 2. Section 03300 – Cast In-Place Foundations

1.2 QUALITY ASSURANCE:

- A. Regulatory Requirements:
 - 1. Acoustical performance: Minimum NRC (Noise Reduction Coefficient) rating of 1.15 and minimum STC (Sound Transmission Class) of 37 (refer to drawings for STC requirement) after panel fabrication.
 - 2. Structural requirements: design panels and attachment system for this installation to withstand wind load of ____ pounds per square foot, both positive and negative.
 - 3. Reference Standards:
 - a. ASTM E90-99 and E413-87 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
 - b. ASTM C423-90A and ASTM E795-00, Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

1.3 SUBMITTALS:

- A. Product Data: Manufacturer's product specifications.
- B. Shop Drawings: Complete drawings showing components including mechanical and electrical requirements.
- C. Certificate of Compliance: Certify completed assembly meets requirements specified herein.
- D. Submit in accordance with Section 01300.
- E. Stamped (P.E.) calculations for all structural and panel components certifying compliance with required wind load.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver products in sufficient quantity and time to maintain approved construction schedule.
- B. Materials shall be in original containers with seals unbroken and labels intact until time of use. Wrapped or bundled materials shall bear name of manufacturer and product. Damaged or otherwise unsuitable material, when so ascertained, shall be removed from Project site.
- C. Store products in secure, dry location, out of way of construction operations. Store products off ground and protect from elements. Wetting of elements not permitted.
- D. Prevent damage to materials, to other stored products, to existing construction, and project work.

1.5 WARRANTY

Finish warranty: Furnish panel manufacturer's written warranty covering failure of the factory-applied finish on metal panels within the warranty period. This warranty shall be in addition to and not a limitation of other rights the Owner may have against the Contractor under the Contract Documents.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Acoustic Barrier wall shall be constructed of type QuietLine Model SL-R, (for reveal) Panels manufactured by Noise Barriers, LLC., Schaumburg, IL.

Manufacturer:

Noise Barriers, LLC (NBL)
1207 Remington Road, Suite E
Schaumburg, IL 60173

Phone: (847) 843-0500
Fax: (847) 843-0501
www.noisebarriers.com

Contact:

John Finnegan

Phone: (315) 682-3821
Fax: (315) 682-3868
j.finnegan@noisebarriers.com

2.2 PANEL CONSTRUCTION

- A. Except as shown on Drawings or at locations described below, use 5” thick. Exterior surfaces are solid sheet 14-ga. Galvanized steel. Interior surfaces are 20-ga. Perforated galvanized steel.
- B. Sound-retarding and absorbing fill material shall be noncombustible, inert mildew-resistant and vermin proof.
- C. Vertical panel reinforcement shall be minimum of 18 ga. Cold rolled steel.
- D. Spot welds shall be no more than 2 in. apart.
- E. Prior to attaching face sheet, panel shall be dampened and filled with sound-retarding and absorbing elements. Fill shall be slightly larger and thicker than inside dimensions of panel. No voids will be tolerated.
- F. Acoustic fill material shall be held back from inside perforated surface by means of an open mesh spacer.
- G. Weep holes to permit water runoff shall be provided on all horizontal surfaces.

2.4 FINISH PAINT

- A. After final assembly the panel modules shall be factory coated with a polyester powder coating system that is applied through the use of an electrostatic charge which will ensure uniform panel and edge coverage. The powder will be thermally bonded to the panels.

2.5 INTERCHANGEABILITY AND REUSE

- A. Acoustic structural components having same part numbers shall be completely interchangeable.
- B. Acoustic structure shall be such that no components will be damaged upon disassembly. Design shall allow structure to be assembled, disassembled and reassembled minimum of 3 times without detracting from acoustic performance.

PANEL SYSTEM ACOUSTICAL PERFORMANCE CHARACTERISTICS

- A. Panel system shall be tested by a recognized and approved laboratory in accordance with ASTM standards.
 - 1. Submit certified laboratory test including absorption and transmission loss values for special panel type and construction of not less than following:

SOUND TRANSMISSION LOSS, db

Octave Band							
Center Frequencies (Hz)	<u>125</u>	<u>250</u>	<u>500</u>	<u>1K</u>	<u>2K</u>	<u>4K</u>	<u>STC</u>
5" Thick Panel	18	26	35	45	49	52	37

SOUND ABSORPTION COEFFICIENTS

Octave Band							
Center Frequencies (Hz)	<u>125</u>	<u>250</u>	<u>500</u>	<u>1K</u>	<u>2K</u>	<u>4K</u>	<u>NRC</u>
5" Thick Panel	0.92	1.15	1.22	1.13	1.08	1.04	1.0 (1.15)

2.8 PANEL SUPPORTS AND ANCHORAGE

- A. Secondary Framing:
 - 1. 5" Thick Panel Supports: Provide support and attachment system for attachment of 5" thick panels between flanges of steel support structure. Panels may be attached in web space between column flanges. Where required by site constraints provide support required to offset parapet.

I. PART 3 - EXECUTION

1.1 PANEL SUPPORTS AND ANCHORAGE

- A. Install columns and required structural panel support members and anchorage in accordance with AISC Manual of Steel Construction "Code of Standard Practice".
- B. Install panel support members on foundations as per engineered requirements.

1.2 PANEL INSTALLATION

- A. Install panels according to manufacturer's instructions and recommendations, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal and structural movement.
 - 1. Field cutting of exterior panels is not permitted.
 - 2. Install panels with exposed fasteners prefinished to match panel finishes.
- B. Accessories: Install components required for a complete acoustical barrier panel system, including trim, coping, supports and attachments, connections between panels, seam covers, sealants, fillers, closures strips and similar items.

1.3 CLEANING AND ADJUSTMENT

- A. Damaged units: Replace panels and other components of the work that have been damaged or have deteriorated beyond successful repair by means of finish touch up or similar minor repair procedures.
- B. Cleaning: Remove temporary protective coverings and strippable films (if any) as soon as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION

**SECTION 05120
STRUCTURAL STEEL**

PART 1 - GENERAL

1.01 GENERAL

- A. Drawings and the general provisions of the Contract, including General and Supplementary Conditions and Division 1, General Requirements apply to work of this Section.
- B. Examine all Drawings and all Sections of the Specifications for requirements and provisions affecting the work of this Section.

1.02 DESCRIPTION OF WORK

- A. Furnish and fabricate all items necessary to complete work indicated on the drawings and as specified herein. Structural steel shall be as defined in the AISC Code of Standard Practice for Steel Building and Bridges. Work shall include, but not be limited to providing all materials and labor required for fabrication and erection of structural steel for wall construction. All work shall conform to the AISC, Latest edition.
- B. Include anchor bolts for column bases, column setting, base and bearing plates, beams, columns, column and beam detail connections, angles, bolts, stiffeners, plates and electrodes (for welded work).

1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Carefully examine all of the Contract Documents for requirements which effect the work of this section.

1.04 QUALITY ASSURANCE

- A. Codes and Standards: Comply with provisions of following, except as otherwise indicated:
 - 1. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including "Commentary" and Supplements thereto as issued.
 - 2. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.
 - 3. ANSI/AWS D1.1 "Structural Welding Code".
 - 4. SSPC "Painting Manual Vol. 1, Good Painting Practice".

- 5. SSPC "Painting Manual Vol. 2, Systems and Specifications".
 - B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Standard Qualification Procedure".
 - C. Fabricators Qualifications: Engage a firm experienced in fabricating structural steel similar to that indicated for the project and with a record of successful in-service performance.
- 1.06 SUBMITTALS
- A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products.
 - 1. Structural steel (each type).
 - 2. High-strength bolts (each type), including nuts and washers.
 - 3. Structural steel hot-dip galvanizing.
 - B. Shop Drawings: Submit shop drawings, after field survey and adjustments are made, to the Engineer for approval, prepared under supervision of a registered professional engineer, including complete details and schedules for fabrication and assembly of structural steel members procedures and diagrams.
 - 1. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld.
 - 2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.
- 1.07 DELIVERY, STORAGE AND HANDLING
- A. Deliver structural steel to project site at such intervals to insure uninterrupted progress of work.
 - B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete, in ample time to not delay work.
 - C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration.

- D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Metal Surfaces, General: For fabrication of work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.
- B. Structural Steel Shapes: Columns shall be Wide Flange Structural , Base plates shall be minimum 12" x 12" x 1" and Structural angle (panel track) shall be 3" x 3" x 1/4": ASTM A36, and other types and sizes as indicated on design Drawings.
- C. Anchor Bolts: ASTM A 307, 6" of exposed thread and embedment as shown on design drawings..
- D. Unfinished Threaded Fasteners: ASTM A 325,
 - 1. Provide hexagonal heads and nuts for all connections.
- E. Electrodes for Welding: Comply with AWS Codes as indicated on Drawings. Filler metal for welding shall conform to the requirements of the AWS, E70XX classification.
- G. Structural Steel Hot-Dip Galvanizing: Provide steel member with commercial grade hot-dip galvanized coating:
 - 1.

2.02 FABRICATION

- A. Shop Fabrication and Assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications for building steel, AASHTO specifications for bridge steel and as indicated on final shop drawings with the modifications and additional requirements specified in this Section.
 - 1. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.

- B. Connections: Weld or bolt shop connections, as indicated.
1. Bolt field connections, except where welded connections or other connections are indicated.
 - a. Provide 5/8" diameter high-strength threaded fasteners for principal bolted connections, except where unfinished bolts are indicated.
 - b. Diameter of holes in bolted parts shall be 1/16" greater than the nominal diameter of the bolt. No unfinished holes will be accepted, and enlargement of holes shall not be accomplished by burning. Burrs resulting from drilling or punching shall be ground to the surface of the material. Shearing and punching shall be done cleanly so as not to deform or mar adjacent surfaces.
 2. Eccentric connections shall be avoided if possible. Where necessary, care shall be taken that all shears, tensions and connections provided by eccentricities are amply provided for in connections and that harmful additional stress are not introduced into members.
- C. Welded Construction: Comply with AWS Codes for procedures, appearance and quality of welds, and methods used in correcting welding work.
1. Assemble and weld built-up sections by methods which will produce true alignment of axes without warp.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Erector must examine areas and conditions under which structural steel work is to be installed, and notify Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Erector.

3.02 ERECTION

- A. Surveys: Check elevations of concrete bearing surfaces, and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Architect.
- B. Temporary Shoring and Bracing: Provide temporary shoring and bracing members with connections of sufficient strength to bear imposed loads. Remove

- temporary members and connections when permanent members are in place and final connections are made.
- C. Anchor Bolts: Furnish anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
 - 1. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.
 - 2. Refer to Division 3 of these specifications for anchor bolt installation requirements in concrete.
 - D. Setting Bases: Clean concrete bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base plates.
 - 1. Set attached base plates for structural members on wedges or other adjusting devices.
 - E. Tighten anchor bolts after supported members have been positioned and plumbed. Do not remove wedges or shims, but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout.
 - F. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.
 - 1. For proprietary grout materials, comply with manufacturer's instructions.
 - G. Field Assembly: Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
 - 1. Level and plumb individual members of structure within specified AISC tolerances.
 - H. Welding: Field welding shall be executed in accordance with all requirements of AWS. All field welding shall be done by manual shielded metal-arc welding, only.
 - 1. All groove welds shall be continuous and full penetration welds unless otherwise shown on the design drawings. Welds made without the aid of a backing shall have their roots chipped, ground or gouged out to sound metal from the second side, before welding is done from the second side.
 - I. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.

1. Do not enlarge unfair holes in members by burning or by use of drift pins, except in secondary bracing members. Ream holes that must be enlarged to admit bolts.
- J. Touch-Up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint. Apply cold galvanizing paint to exposed areas.
1. Apply by brush or spray to provide minimum dry film thickness of 2.0 mils.

3.03 QUALITY CONTROL

1. If Required, testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
 2. Provide access for testing agency to places where structural steel work is being fabricated or produced so that required inspection and testing can be accomplished.
 3. Testing agency may inspect structural steel at plant before shipment; however, Engineer reserves the right, at any time before final acceptance, to reject material not complying with specified requirements.
- A. Welded Connection Testing:
1. Visually inspect all welds for size, length, and location in accordance with AWS D1.1. Measure and record the size and length of 25 percent of all welds at random locations.
- B. Bolted Connection Testing:
1. Visually inspect all bolted connections for bolt and nut size and grade, and for snug contact of all connected elements in accordance with AISC Manual of Steel Construction.
- C. Correct deficiencies in structural steel work which inspections have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any non-compliance of original work, and as may be necessary to show compliance of corrected work.

3.04 CLEAN-UP

- A. All work provided under this Section shall be cleaned of all oil, dirt, debris, and other foreign materials, and shall be ready to receive any scheduled finish coating, or attachment or other systems specified elsewhere.
- B. The subcontractor providing the Work of this Section shall maintain the effected work area neat and clean at all times.

END OF SECTION