



Illinois Department of Transportation

2300 South Dirksen Parkway / Springfield, Illinois / 62764

December 12, 2005

SUBJECT: FAS Route 94 & FAP Route 332
Project ACNHI-ACNHF-000S(471)
Section (0203.1 & 0312-708W)R-3
Cook County
Contract No. 62108
Item No. 2P, 12/16/2005 Letting
Addendum B

NOTICE TO PROSPECTIVE BIDDERS:

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

1. Revised pages 402-414 of the Special Provisions. The Special Provision for Noise Abatement Wall (Absorptive with Soil Profiles) issued with Addendum A for the contract is incorrect. The correct Special Provision for the Noise Abatement Wall is included with this Addendum.

Prime contractors must utilize the enclosed material when preparing their bid and must include any Schedule of Prices changes in their bidding proposal.

Bidders using computer-generated bids are cautioned to reflect any and all Schedule of Prices changes, if involved, into their computer programs.

Very truly yours,

Michael L. Hine
Engineer of Design
and Environment

A handwritten signature in cursive script, reading "Ted B. Walschleger" followed by "P.E." in a smaller font.

By: Ted B. Walschleger, P. E.
Engineer of Project Management

cc: Diane O'Keefe, Region 1, District 1; N. R. Stoner; Roger Driskell; R. E. Anderson; Estimates; Design & Environment File

TK/sar

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NOISE ABATEMENT WALL (REFLECTIVE WITH SOIL PROFILES)

This work shall consist of designing, preparation of shop drawings, and the furnishing of materials and equipment necessary to construct noise abatement walls in accordance with these special provisions, details in the plans, Section 720 of the Standard Specifications and at the locations shown on the plans or as directed by the Engineer.

General. The noise abatement wall shall consist of panels spanning between vertical posts supported by concrete foundations (ground mounted), or supported by bridge parapets, retaining walls or traffic barriers (structure mounted) as shown on the contract plans. The design, fabrication, construction and materials shall comply with these special provisions and the requirements specified by the noise wall supplier selected by the Contractor for use on this project.

The Contractor shall verify the wall locations of the proposed ground mounted wall for conflicts and realign or redesign the wall to avoid any conflicts. The Contractor shall field verify all structure mount locations constructed in prior contracts and adjust the noise abatement wall designs according to the current field conditions. The Contractor shall inform the Engineer in writing of any conflicts before realigning or redesigning the wall.

The wall components shall be fabricated and erected to produce a precast concrete reflective noise wall system satisfying the acoustical requirements stated in these special provisions. Other abatement systems will not be allowed as equal alternates.

All appurtenances behind, in front of, under, over, mounted upon, or passing through, such as drainage structures, fire hydrant access, highway signage, emergency access and utilities shall be accounted for in design of the wall.

Submittals. The Contractor shall prepare a wall and foundation design submittal for the Engineer for review and approval. The noise wall shall be designed and constructed to extend to the minimum lines, grades and dimensions of the wall envelope, with no omissions or gaps, as shown on the contract plans and as directed by the Engineer.

Complete design calculations for wall panels, posts, foundations, and all connections and shop drawings shall be submitted to the Department for review and approval no later than 60 days prior to beginning construction of the wall. The time required for the preparation and review of these submittals shall be charged to the allowable contract time. Delays caused by untimely submittals or insufficient data will not be considered justifications for any time extensions. No additional compensation will be made for any additional material, equipment or other items found necessary to comply with the project specifications as a result of the Engineer's review. The Contractor will be required to submit the necessary shop drawings as per Article 105.04 of the Standard Specifications. All submittals shall be sealed by a Structural Engineer licensed in Illinois and include, but not be limited to, the following items:

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Submittals shall include all details, dimensions, quantities and cross sections necessary for the construction of the noise abatement wall and will include but not limited to:

- (1) A plan view of the wall that indicates the stations and offsets from the centerline to the face of the wall and required to locate the drilled shaft foundations. The proposed foundation diameter(s) and spacing(s) shall be indicated with all changes in the walls horizontal alignment shown. Each panel and post shall be numbered and any changes in type or size shall be noted. The centerline of any utilities passing under the wall and locations of expansion joints, access doors, lighting, signing and drainage structures shall also be shown.
- (2) An elevation view of the wall, indicating the elevations of the top of the posts and panels as well as the elevations of the bottom of the panels, tops of the shaft foundations, all steps in wall system and the finished grade line. Each post size and length, panel type and size, and foundation depth shall be designated.
- (3) A typical cross section(s) that shows the panel, post, foundation or bridge parapet, and the elevation relationship between existing ground conditions and the finished grade as well as slopes adjacent to the wall.
- (4) All general notes required for constructing the wall.
- (5) All details for the steps in the bottom of panels shall be shown. The bottom of the panels shall be located at or below the theoretical bottom of panel line shown on the contract plans. The theoretical bottom of panel line is assumed to be 150 mm (6 in.) below the finished grade line at front face of the wall for ground mounted walls and at the top of the structure for structure mounted walls, unless otherwise shown on the contract plans.
- (6) Tops of the panels and posts shall extend to or above the theoretical top of wall line shown on the contract plans. All panel tops shall be cast and placed horizontally with any changes in elevation accomplished by stepping adjacent panel sections at posts. Steps shall not exceed 300 mm (1 ft.) in height, except within the last 15 m (50 ft.) where 600 mm (2 ft.) steps will be permitted.
- (7) All panel types shall be detailed. The details shall show all dimensions necessary to cast and fabricate each type of panel, the reinforcing steel, and location of post or foundation connection hardware as well as lifting devices embedded in the panels and posts.
- (8) All post types shall be detailed and designed for 3.6 m (12 ft.) spacing unless noted otherwise by the plans, field conditions or manufacturer. Post spacing for barriers on walls shall be limited to a distance that does not over stress the structure or barrier.
- (9) Details of wall panels with appurtenances attached to or passing through the wall, as shown on the contract plans, such as utilities, fire or access doors, drainage structures, signs etc. shall be shown. Any modifications to the design or location of these appurtenances to accommodate a particular system shall also be submitted.

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- (10) All architectural panel treatment, including color, texture and form liner patterns shall be shown. All joints shall be placed horizontal or vertical.
- (11) The details for the connection between panels and posts as well as their connection to the foundation and bridge parapet shall be shown. Foundation details including details showing the dimensions, reinforcement and post anchorage system for the drilled shaft foundations shall be shown.
- (12) Testing, certifications and reports from independent laboratories showing that the panel and post deflection satisfy the criteria shown in the design criteria section of this specification. The testing for the flame spread, smoke density and freeze-thaw/salt scaling requirements described in the materials section of this specification shall also be submitted.
- (13) Manufacturer recommended installation requirements, a sequence of construction and a detailed bill of materials shall be included.
- (14) The color of the wall panels and support posts shall be Federal Color Standard color number 595-B.

The Contractor shall deliver to the Department (attention Mr. Rick Wanner 847-705-4172) a 600 mm x 600 mm (2 ft. x 2 ft.) sample of the colors, textures and patterns proposed for use on the project for approval. The samples must be made at the same plant that will be making the product for the noise wall under this contract and be representative of those which will be tested per this specification. Once the color sample is approved, a batch shall be designated by batch number and date and will remain the standard for the entire project.

The Contractor shall submit site access plans showing access and limits of the work areas for the installation of the wall and any required traffic controls are to conform to the requirements in the special provision for TRAFFIC CONTROL PLAN.

The initial submittal shall include three (3) sets of shop drawings and calculations. One set of drawings will be returned to the Contractor with any corrections indicated. The Contractor shall do no work or ordering of materials for the structure until the Engineer has approved the submittal.

Design Criteria. The wall system shall be designed to withstand wind pressure, applied perpendicular to the panels in either direction, according to the AASHTO Guide Specifications for Structural Design of Sound Barriers (latest edition) including interims. The concrete and steel components shall be designed according, to the 2002 AASHTO Standard Specifications for Highway Bridges (17th Edition), and as specified herein. The contractor shall be responsible for the structural adequacy of the panels, posts, foundations and connections as well as overall wall overturning stability. The design shall account for the presence of all appurtenances mounted on or passing through the wall such as drainage structures, existing or proposed utilities, fire or access doors and other items.

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The design wind loading shall be 1.7 kN/m^2 (35 psf.) when located on bridge structures, retaining walls or traffic barriers. This loading can be reduced to 1.2 kN/m^2 (25 psf.) when ground mounted on drilled shafts. For structure mounted walls, the panel dead weight must not exceed 2.6 kPa (55 psf.) of wall face area.

For ground mounted noise abatement walls the posts shall be connected to drilled shafts with anchor bolts as required by design. The minimum number of anchor bolts per post shall be four M 30 A449 threaded anchor rods embedded into each foundation, which shall be reinforced in accordance with AASHTO specifications. The anchor rod assembly shall be installed and payment shall be included in the cost for NOISE ABATEMENT WALL, GROUND MOUNTED.

The material and construction of the foundations (drilled shafts) shall be in accordance with the Special Provision for DRILLED SHAFTS except that the payment for the drilled shaft and reinforcement will be included with the payment for the NOISE ABATEMENT WALL, GROUND MOUNTED.

The shaft foundation dimensions shall be determined using Broms method of analysis. Soils profiles from prior soil investigations are shown in the plans. The design shall utilize a factor of safety of 2.0, applied to the soil shear strength if cohesive or the unit weight if granular, and account for the effects of a sloping ground surface and water table indicated on the plans. The following should be assumed for the foundation design:

Effective unit weight	70pct.
Internal friction angle	30 deg.
Cohesion intercept	0 ksf

The maximum allowable panel deflection shall be no more than the panel length (L) divided by 240 (L/240) for ground-mounted panels and panel length (L) divided by 180 (L/180) for structure-mounted panels. The vertical posts shall have a maximum deflection of (H/180) where H is the height of the post above the foundation. A lateral load report shall be submitted to the Engineer indicating that the above noted design lateral loads can be applied to the panels and/or posts without exceeding noted deflection tolerance.

Corrugations, ribs or battens on the panel must be oriented vertically when erected. The panels shall be designed to prevent entrapment and ponding of water. The noise barrier walls shall not have openings allowing the perching or nesting of birds or the collection of dirt, debris or water. The walls shall not have handholds or grips promoting climbing of the walls.

Fire hydrant access points (300mm diameter) shall be designed with additional reinforcement or bracing and protective coating around the opening as necessary to maintain structural integrity in accordance with the details shown in the plans.

Emergency access doors (1.52 m by 2.59 m) shall be a galvanized, painted steel door including all necessary framework, support members and finish hardware as necessary.

Signs indicating the emergency access and the name of the adjacent residential street shall be installed on both faces of the wall and door as shown on the details for the access door.

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Emergency Access Door Approximate Locations:

LEGEND LAYOUT	SIZE (MM)	SIGN SIZE & COLOR LEGEND / BACKGROUND BORDER	NUMBER OF SIGNS	
EMERGENCY ACCESS	100 125C 100 125C 100	1050 MM X 450 MM WHITE / RED 15 MM BORDER	2	
166 th St.	100 100C 100	450 MM X 300 MM, WHITE / RED, 15 MM BORDER	2	

The signs shall be paid for in accordance with Section 720 of the Standard Specifications for Sign Panel, Type 1 and shall include the fabrication and installation of the sign panels to the sound barrier system and emergency access door as shown in the details.

All emergency access door materials, including steel doors, frames, finish hardware, attachments to vertical support posts and incidentals shall be included in the cost of the wall mounted sound barrier panels. All labor and materials required to erect and install emergency access doors shall be included in the unit cost for NOISE ABATEMENT WALL, STRUCTURE MOUNTED.

Materials. The wall materials shall conform to the supplier's standards, AASHTO Specifications for noise walls and the following:

- (a) Reinforcement bars satisfy AASHTO M 31M, M 42M, or M 53M Grade 60. Welded wire fabric shall be according to AASHTO M 55M.
- (b) The concrete for the precast elements shall be Class PC according to Section 1020 of the current IDOT Standard Specifications. Cement shall be Type I, II, or III and shall conform to the requirement of AASHTO M-85. Additives containing chloride shall not be used without the approval of the Department. The compressive strength at 28 days shall not be less than 30 MPa (4500 psi), according to Article 504.05 of the current IDOT Standard Specifications. Wooden or steel materials will not be allowed as substitutes for the panels. The concrete elements shall be tested according to ASTM C 672 (as modified in the HITEC report on sound barriers 96-04) and shall not exhibit excessive deterioration (cracks, spalls,

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aggregate disintegration, or other objectionable features) to demonstrate resistance to deicing chemicals. The concrete elements shall be tested according ASTM C 666 and shall not exhibit excessive deterioration to demonstrate resistance to freeze-thaw conditions.

- (c) Steel plates, shapes, connectors, access doors and posts shall conform to AASHTO M 270M Grade 250 (36) or 345 (50). All portions of the post shall be galvanized according to AASHTO M111 and ASTM A385. All portions of the steel doors and frames shall be zinc coated (galvanized) by hot dip process; commercial quality, ASTM A 526, G 20. The portion of steel posts, doors and framework for the doors exposed to view shall then be painted with an acrylic/acrylic paint system in the shop according to the special provision CLEANING AND PAINTING NEW METAL STRUCTURES except that the inorganic zinc rich primer may be omitted. CLEANING AND PAINTING NEW METAL STRUCTURES shall be included in the unit price of the NOISE ABATEMENT WALL of the type required. The color of the acrylic/acrylic paint system shall closely match the panels. Steel bolts, nuts, washers and anchor bolts shall be galvanized according to AASHTO M232.
- (d) Coloring of concrete elements shall be accomplished using a single component, water based sound adsorptive penetrating architectural stain satisfying ASTM G155 –Xenon light source.

The Noise Barrier Wall surfaces shall be prepared in accordance with the stain manufacturer's written instructions. Surfaces must be clean and free of oil, grease, laitance, efflorescence and any other contaminants that could prevent good adhesion.

Prior to use, the stain shall be thoroughly mixed using a drill with a "Jiffy" type mixer attachment or other mechanical means suitable for use. Mix approximately 3-5 minutes or until color is uniform throughout and the material is homogeneous. Remix as required to maintain uniformity.

Penetrating Architectural Concrete Stain must be applied at the manufacturing plant. Staining in the field on site will not be allowed. In order to apply stain, both the Noise Barrier panels and air temperature must be between 45°F and 90°F. Stain shall not be applied unless weather conditions will permit complete drying of material prior to rain, fog, dew or temperatures beyond the prescribed limits. Stain shall not be applied to damp surfaces. Stain shall be applied in one coat and shall provide a uniform appearance. The final color shall be consistent with the quality and appearance of the approved sample area.

The finish will consist of a rolled Ashlar Stone finish. Rolled finishes shall have a minimum 0.75 in. (19 mm) impression.

- (e) With the exception of the steel and Portland cement concrete elements of the wall, all materials shall be tested for flame spread and smoke density developed in accordance with ASTM E84. The material must exhibit a flame-spread index less than 10 and a smoke density developed value of 10 or less.

Fabrication. All precast units shall be manufactured according to Section 504 of the Standard Specifications and the following requirements and tolerances with respect to the dimensions shown on the approved shop drawings.

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- (a) The minimum reinforcement bar cover shall be 40 mm (1½ in.).
- (b) All reinforcement shall be epoxy coated.
- (c) Panel dimensions shall be within 6 mm (¼ in.).
- (d) All hardware embedded in panels or posts shall be within 6 mm (¼ in.).
- (e) Angular distortion with regard to panel squareness, defined as the difference between the two diagonals, shall not exceed 13 mm (½ in.).
- (f) Surface defects on formed surfaces measured on a length of 1.5 m (5 ft.) shall not be more than 2.5 mm (0.10 in.).
- (g) Posts shall be installed plumb to within 13 mm (½ in.) of vertical for every 5 m (15 ft.) of height and to within 13 mm (½ in.) of the station and offset indicated on the approved shop drawings.
- (h) Drilled shaft foundations shall be placed within 50 mm (2 in.) of the station and offset indicated on the approved shop drawings.
- (i) All lifting inserts cast into the panels shall be hot dipped galvanized.

The date of manufacture, the production lot number, and the piece-mark shall be clearly noted on each panel.

Any bolts or fasteners used shall be recessed or embedded below the surface.

Both sides of the panels shall be light brown in color with a textured Ashlar Stone finish unless stated otherwise on the contract plans.

The panels, posts and other visible elements shall be fabricated with a light brown earth tone color following the procedures noted in the materials section of this specification unless otherwise shown on the contract plans.

The steel doors and frames for the emergency access doors shall be fabricated in accordance with NAAM CHM, except as noted:

Doors shall be full flush seamless type fabricated from 16 gauge (minimum) stretcher leveled cold rolled steel sheets. The doors shall be reinforced and stiffened at 150 mm (6 inch) spaces on center vertically. Vertical edges shall be joined either by a continuous weld extending the full door height or by a 14-gauge (minimum) channel with 2 continuous full height welds. Welds shall be ground, filled and dressed smooth. Edges shall be beveled 3 mm (1/8 inch) in 50 mm (2 inches). A 14-gauge (minimum) reinforcing channel at the top and bottom of the door shall be spot welded within the door. The top and bottom of the door shall be closed flush to the door face sheets.

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Door frames shall be roll formed from 14-gauge (minimum) cold rolled steel sheets. Doorframes shall have mitered corners with contact edged perfectly membered. Corner faces shall be continuously welded. The use of gusset plates will not be allowed. All stops shall be butted. Cope and weld joints. Grind welds to a smooth uniform finish.

Minimum reinforcement for finish hardware shall be:

1. 4.76 mm (3/16 inch) by 254 mm (10 inches) for hinges.
2. 12 gauge for locks, flush bolts, holders and closures.
3. 16 gauge for surface applied items (Signage).

Hinges:

Hinges shall be 114 mm (4-1/2 inches) by 114 mm (4-1/2 inches) with sufficient width to permit doors to swing 180° and be flush bearing design.

Access mechanism:

Access shall be from the outside of the noisewall only. The door shall be self-latching with a padlockable hasp and provided with a large handle to ease the opening of the door. One (1) weather resistant stainless steel padlock and two (2) keys are to be provided by the Contractor. The Contractor shall provide the keys to the Engineer once the locks have been placed. Two grab bars shall be installed vertically on the outside of the door only. One bar shall be installed on the door panel and the other bar shall be installed on the frame. The grab bars shall be installed above the latch and locking mechanism. The bars shall be 600mm (24") long, 38 mm (1-1/2") O.D., 18-gauge stainless steel with a safety grip finish.

After fabrication, exposed metal parts shall be cleaned of all rust, scale, oil, grease or other foreign matter; then bonderized and one shop coating of primer applied. The finish coat may be field applied. A protective coating shall be applied to door frame surfaces, which are concealed.

The integrity of the sound barrier continuity, including the access doors, shall be such that no light passes through any vertical or horizontal joint in the system, nor between the system and the ground.

Steel doors and frames shall be installed in accordance with the approved shop drawings and manufacture's directions. The finish hardware shall be installed in accordance with the recommendations of the National Builders Hardware Association and the manufacture's directions.

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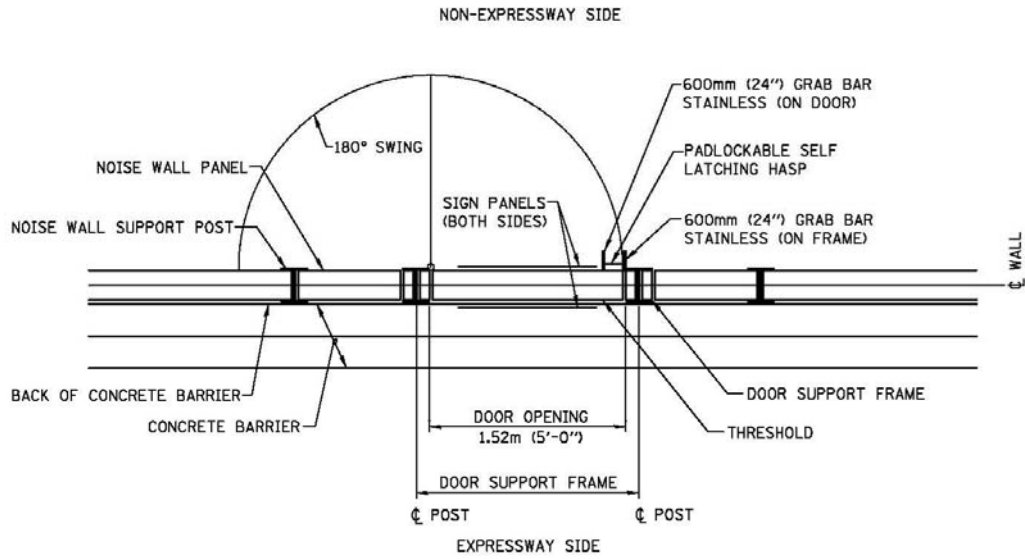
Signing at each emergency access door: The Contractor shall furnish the signs, which are shown on the table included herein and shall install them on the noise wall or access doors as detailed in the plans.

LEGEND LAYOUT	SIZE (MM)	SIGN SIZE & COLOR LEGEND / BACKGROUND BORDER	NUMBER OF SIGNS	
EMERGENCY ACCESS	100 125C 100 125C 100	1050 MM X 450 MM WHITE / RED 15 MM BORDER	2	
166 th St.	100 100C 100	450 MM X 300 MM, WHITE / RED, 15 MM BORDER	2	

The signs shall be paid for in accordance with Section 720 of the Standard Specifications for Sign Panel, Type 1 and shall include the fabrication and installation of the sign panels to the sound barrier system and emergency access door as shown in the details.

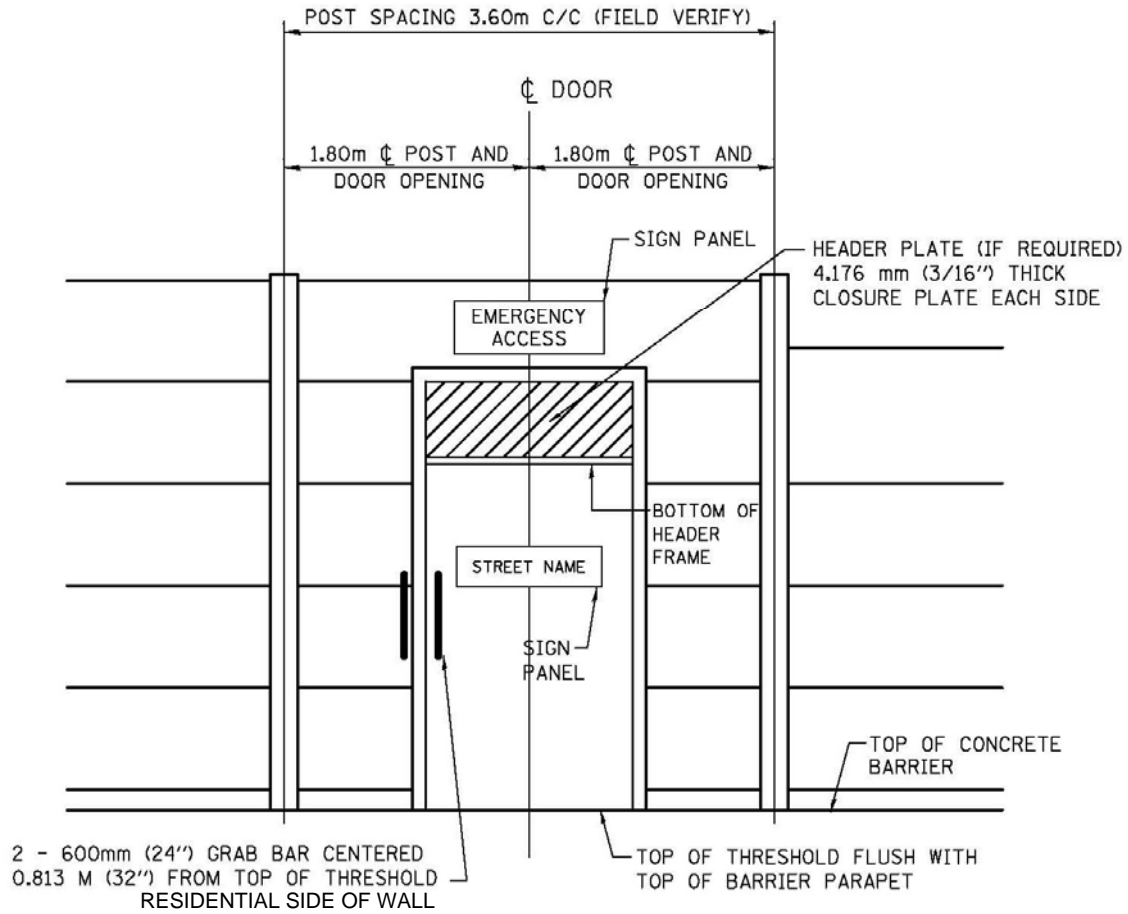
All emergency access door materials, including steel doors, frames, finish hardware, attachments to vertical support posts and incidentals shall be included in the cost of the wall mounted sound barrier panels. All labor and materials required to erect and install emergency access doors shall be included in the unit cost for NOISE ABATEMENT WALL, STRUCTURE MOUNTED.

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EMERGENCY ACCESS DOOR
TOP VIEW

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EMERGENCY ACCESS DOOR

ELEVATION VIEW
 FROM EXPRESSWAY SIDE

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Construction. The Contractor shall obtain technical assistance from the supplier during wall erection to demonstrate proper construction procedures and shall include any costs related to this technical assistance in the unit price bid for this item. The instructions provided here are guidelines and do not relieve the contractor of the responsibility to adhere to contract specifications.

It is recommended that all bottom panels be installed for a length of wall prior to placing middle or top panels. After bottom panels are in-place, finish grading can be accomplished with heavy equipment by reaching over the in-place panels. Problems associated with lack of access to the backside of the wall or limited right-of-way can be avoided.

Site excavations and/or fill construction shall be completed to plan elevations and profiles prior to the start of wall foundation construction. All underground utility or drainage structure installation shall be completed prior to foundation installation. The ground elevations as shown on the plans and the approved noise barrier wall shop drawings shall be verified by the contractor and discrepancies corrected prior to material fabrication. The locations of underground utilities and overhead obstructions shown on the plans shall be verified and considered by the Contractor prior to wall erection.

If the soils encountered during drilling of the foundations do not satisfy the design strengths shown on the contract plans, the Engineer shall be notified to evaluate the required foundation modifications. The shaft foundation will normally require additional length, which may be paid separately under Article 104.03 of the Standard Specifications. All drilled shaft excavations shall be filled with concrete within 6 hours of their initiation. The concrete for the drilled shaft foundations shall be Class SI and shall be placed against undisturbed, in-place soils. The concrete at the top of the shaft shall be shaped to provide the panels on each side of the post adequate bearing area and correct elevation per the approved shop drawings.

Units shall be shipped, unloaded, handled and stored in such a manner as to minimize the danger of staining, chipping, spalling, development of cracks, fractures, and excessive bending stresses. Any touch up and repair is at the Contractor's expense and shall be carried out according to the manufacturer's recommendations or as directed by the Engineer.

Method of Measurement. The noise abatement wall will be measured by the square meter (square foot) from the wall envelope, defined by the theoretical top of wall line to the theoretical bottom of panel line for the length of the wall (ground mounted or structure mounted) as shown on the contract plans Sign panels will be measured for payment in square meters (square feet) according to Article 720.03..

Basis of Payment. This work will be paid for at the contract unit price per square meter (square foot) for NOISE ABATEMENT WALL, GROUND MOUNTED and/or NOISE ABATEMENT WALL, STRUCTURE MOUNTED measured as provided above. Sign panels will be paid for at the contract unit price per square meter (square foot) for SIGN PANEL-TYPE 1.

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This shall be payment in full for developing the wall and foundation design, preparation of shop drawings, all labor, equipment and material required for the manufacture, testing, delivery and erection of the panels, concrete or metal posts, all fire hydrant and emergency access doors and openings and coordination, post connection system to the foundation (or structure), and foundations (for the ground mounted walls only).

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