

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE _____ PAGE _____ OF _____ PAGES

2. AMENDMENT/MODIFICATION NO. _____ 3. EFFECTIVE DATE _____ 4. REQUISITION/PURCHASE REQ. NO. _____ 5. PROJECT NO. *(If applicable)* _____

6. ISSUED BY _____ CODE _____ 7. ADMINISTERED BY *(If other than Item 6)* _____ CODE _____

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)* _____ (X) 9A. AMENDMENT OF SOLICITATION NO. _____
 9B. DATED *(SEE ITEM 11)* _____
 10A. MODIFICATION OF CONTRACT/ORDER NO. _____
 10B. DATED *(SEE ITEM 11)* _____
 CODE _____ FACILITY CODE _____

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers is extended, is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:
 (a) By completing items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment your desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)* _____

13. THIS ITEM ONLY APPLIES TO MODIFICATION OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

CHECK ONE	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: <i>(Specify authority)</i> THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES <i>(such as changes in paying office, appropriation date, etc.)</i> SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER <i>(Specify type of modification and authority)</i>

E. IMPORTANT: Contractor is not, is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER <i>(Type or print)</i>	16A. NAME AND TITLE OF CONTRACTING OFFICER <i>(Type or print)</i>
15B. CONTRACTOR/OFFEROR	16B. UNITED STATES OF AMERICA
15C. DATE SIGNED	16C. DATE SIGNED
<i>(Signature of person authorized to sign)</i>	<i>(Signature of Contracting Officer)</i>

Item 14. Continued.

CHANGES TO SF 1442 – SOLICITATION, OFFER AND AWARD

1. Standard Form 1442, First Page, Item No. 13.A.- In the second line, change the bid opening date and time from "16 July 2002 at 2 pm local time" to "**23 July 2002 at 2 pm local time**".

CHANGES TO THE SPECIFICATIONS

2. Replacement Sections - Replace the following sections with the accompanying new sections of the same number and title, each bearing the notation "ACCOMPANYING AMENDMENT NO. 0003 TO SOLICITATION NO. DACA63-02-B-0006:"

05500A MISCELLANEOUS METAL
16770A RADIO AND PUBLIC ADDRESS SYSTEMS

CHANGES TO THE DRAWINGS

3. Replacement Drawings.- Replace the drawings listed below with the attached new drawings of the same number, bearing the notation "AM #0003":

G202.cal G202 VOLUME ONE INDEX SHEET
G401.cal G401 OVERALL SITE PLAN
G402.cal G402 OVERALL SITE & PAVEMENT PLAN
C005.cal C005 DEMOLITION PLAN 5
C006.cal C006 DEMOLITION PLAN 6
C007.cal C007 DEMOLITION PLAN 7
C101.cal C101 LAY OUT PLAN 1
C102.cal C102 LAY OUT PLAN 2
C103.cal C103 LAY OUT PLAN 3
C104.cal C104 LAY OUT PLAN 4
C105.cal C105 LAY OUT PLAN 5
C106.cal C106 LAY OUT PLAN 6
C107.cal C107 LAY OUT PLAN 7
C201.cal C201 GRADING PLAN 1
C202.cal C202 GRADING PLAN 2
C203.cal C203 GRADING PLAN 3
C204.cal C204 GRADING PLAN 4
C205.cal C205 GRADING PLAN 5
C206.cal C206 GRADING PLAN 6
C207.cal C207 GRADING PLAN 7
C301.cal C301 JOINT PATTERN PLAN 1
C302.cal C302 JOINT PATTERN PLAN 2
C303.cal C303 JOINT PATTERN PLAN 3
C306.cal C306 JOINT PATTERN PLAN 6
C307.cal C307 JOINT PATTERN PLAN 7
C401.cal C401 TRAFFIC CONTROL & STRIPING PLAN
C402.cal C402 LAY OUT & GRADING PLAN BID OPTION #2
C501.cal C501 UTILITY PLAN 1
C502.cal C502 UTILITY PLAN 2
C503.cal C503 UTILITY PLAN 3

C504.cal C504 UTILITY PLAN 4
C505.cal C505 UTILITY PLAN 5
C506.cal C506 UTILITY PLAN 6 BID OPTION #4
DA101.cal DA101 POL STORAGE PLANS
DA201.cal DA201 POL STORAGE ELEVATION
EA201.cal EA201LATRINE BUILDING ELEVATIONS BID OPTION 4
G204.cal G204 VOLUME TWO INDEX SHEET
AP201.cal AP201EAST REPAIR BAY PLUMBING FLOOR PLAN
AP203.cal AP203WEST REPAIR BAY PLUMBING FLOOR PLAN
AP703.cal AP703GENERAL PLUMBING DETAILS
U305.cal U305 ELECTRICAL UTILITIES PLAN AREA F
U405.cal U405 EXTERIOR TELECOMMUNICATIONS PLAN AREA I

4. Reference Amendment No. 0001, Changes to the Drawings - In the list of replacement drawings, drawings D-A101 and D-A201 were listed incorrectly and with the wrong sheet numbers. They should have been shown as New Issue Drawings and listed as:

E-A101 LATRINE BUILDING FLOOR PLAN, BID OPTION 4
E-A210 LATRINE BUILDING ELEVATIONS, BID OPTION 4

E-A101 had the correct sheet reference number shown as issued in Amend. No. 0001.
E-A201 had the incorrect sheet reference number shown and is being reissued in Amend. No. 0003 with corrected sheet number.

END OF AMENDMENT

SECTION 05500A

MISCELLANEOUS METAL

04/01

Amendment #0003

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF-45 (1997) Designation System for Aluminum Finishes

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A14.3 (1992) Ladders - Fixed - Safety Requirements

ANSI MH28.1 (1982) Design, Testing, Utilization, and Application of Industrial Grade Steel Shelving

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 36/A 36M (2000) Carbon Structural Steel

ASTM A 53/A 53M (1999b) Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

ASTM A 123/A 123M (2000) Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A 283/A 283M (2000) Low and Intermediate Tensile Strength Carbon Steel Plates

ASTM A 467/A 467M (1998) Machine and Coil Chain

ASTM A 475 (1998) Zinc-Coated Steel Wire Strand

ASTM A 500 (1999) Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

ASTM A 653/A 653M (2000) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A 924/A 924M (1999) General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

ASTM B 26/B 26M	(1999) Aluminum-Alloy Sand Castings
ASTM B 221	(2000) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM B 221M	(2000) Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B 429	(2000) Aluminum-Alloy Extruded Structural Pipe and Tube
ASTM D 2047	(1999) Static Coefficient of Friction of Polish-Coated Floor Surfaces as Measured by the James Machine
ASTM E 814	(2000) Fire Tests of Through-Penetration Fire Stops
ASTM F 1267	(1991; R 1997) Metal, Expanded, Steel
AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)	
ASCE 7	(1998) Minimum Design Loads for Buildings and Other Structures
AMERICAN WELDING SOCIETY (AWS)	
AWS D1.1	(2000) Structural Welding Code - Steel
U.S. GENERAL SERVICES ADMINISTRATION (GSA)	
CID A-A-344	(Rev B) Lacquer, Clear Gloss, Exterior, Interior
NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)	
NAAMM MBG 531	(1994) Metal Bar Grating Manual
NAAMM MBG 532	(1994) Heavy Duty Metal Bar Grating Manual
NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	
NFPA 10	(1998; Errata 10-98-1) Portable Fire Extinguishers
NFPA 211	(2000) Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Miscellaneous Metal Items; .

Detail drawings indicating material thickness, type, grade, and class; dimensions; and construction details. Drawings shall include catalog cuts, erection details, manufacturer's descriptive data and installation instructions, and templates. Detail drawings for the following items: Access Doors; Pipe Guards- Bollards; Downspout Boots; Expansion Joints Assemblies; Maintenance Pit Floor Grate; Trench Drain Grate; Floor Plate Panels; Handrails and Guardrails; Mirror Frame; Ladder; Roof Hatch; Miscellaneous Items; Diamond Mesh Partitions; Safety Nosings; dock bumpers and Steel Stairs.

SD-04 Samples

Miscellaneous Metal Items; G - RE.

Samples of the following items: Access Doors; Expansion Joint Assemblies; Mirror Frames and Safety Nosings. Samples shall be full size, taken from manufacturer's stock, and shall be complete as required for installation in the structure. Samples may be installed in the work, provided each sample is clearly identified and its location recorded.

1.3 GENERAL REQUIREMENTS

The Contractor shall verify all measurements and shall take all field measurements necessary before fabrication. Welding to or on structural steel shall be in accordance with AWS D1.1. Items specified to be galvanized, when practicable and not indicated otherwise, shall be hot-dip galvanized after fabrication. Galvanizing shall be in accordance with ASTM A 123/A 123M, ASTM A 653/A 653M, or ASTM A 924/A 924M, as applicable. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and shall harmonize with the material to which fastenings are applied. Materials and parts necessary to complete each item, even though such work is not definitely shown or specified, shall be included. Poor matching of holes for fasteners shall be cause for rejection. Fastenings shall be concealed where practicable. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Joints exposed to the weather shall be formed to exclude water.

1.4 DISSIMILAR MATERIALS

Where dissimilar metals are in contact, or where aluminum is in contact with concrete, mortar, masonry, wet or pressure-treated wood, or absorptive materials subject to wetting, the surfaces shall be protected with a coat of bituminous paint or asphalt varnish.

1.5 WORKMANSHIP

Miscellaneous metalwork shall be well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Welding shall be continuous along the entire area of contact except where tack welding is permitted. Exposed connections of work in place shall not be tack welded. Exposed welds shall be ground smooth. Exposed surfaces of work in place shall have a smooth finish, and unless otherwise approved, exposed riveting shall be flush. Where tight fits are required, joints shall be milled. Corner joints shall

be coped or mitered, well formed, and in true alignment. Work shall be accurately set to established lines and elevations and securely fastened in place. Installation shall be in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

1.6 ANCHORAGE

Anchorage shall be provided where necessary for fastening miscellaneous metal items securely in place. Anchorage not otherwise specified or indicated shall include slotted inserts made to engage with the anchors, expansion shields, and power-driven fasteners when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; and lag bolts and screws for wood.

1.7 ALUMINUM FINISHES

Unless otherwise specified, aluminum items shall have anodized finish. The thickness of the coating shall be not less than that specified for protective and decorative type finishes for items used in interior locations or architectural Class I type finish for items used in exterior locations in AA DAF-45. Items to be anodized shall receive a polished satin finish. Aluminum surfaces to be in contact with plaster or concrete during construction shall be protected with a field coat conforming to CID A-A-344.

1.8 SHOP PAINTING

Surfaces of ferrous metal except galvanized surfaces, shall be cleaned and shop coated with the manufacturer's standard protective coating unless otherwise specified. Surfaces of items to be embedded in concrete shall not be painted. Items to be finish painted shall be prepared according to manufacturer's recommendations or as specified.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS

Doors and panels shall be flush type unless otherwise indicated. Frames for access doors shall be fabricated of not lighter than 1.52 mm (16 gauge) steel with welded joints and finished with anchorage for securing into construction. Access doors shall be a minimum of 350 by 500 mm and of not lighter than 1.9 mm (14 gauge) steel, with stiffened edges, complete with attachments. Access doors shall be hinged to frame and provided with a flush face, screw driver operated latch. Exposed metal surfaces shall have a shop applied prime coat.

2.2 PIPE GUARDS - BOLLARDS

Pipe guards shall be 250mm round heavy duty steel pipe conforming to ASTM A 53/A 53M, Type E or S, weight STD, black spiral stripe (50mm wide and 50mm apart) on yellow background finish.

2.3 DOWNSPOUT BOOTS

Downspout boots shall be cast iron with receiving bells sized to fit downspouts.

2.4 EXPANSION JOINT COVERS

Expansion joint covers shall be constructed of extruded aluminum with anodized satin finish for walls and ceilings and with standard mill finish for floor covers and exterior covers. Plates, backup angles, expansion filler strip and anchors shall be designed as indicated. Expansion joint system shall provide a one hour fire rating and 50 mm movement.

2.5 FLOOR GRATINGS AND FRAMES

Carbon steel grating shall be designed in accordance with NAAMM MBG 531 and NAAMM MBG 532 to meet the indicated load requirements. Edges shall be banded with bars 6 mm less in height than bearing bars for grating sizes above 19 mm. Banding bars shall be flush with the top of bearing grating. Frames shall be of welded steel construction finished to match the grating. Floor gratings and frames shall be galvanized after fabrication.

2.5.1 Maintenance Pit Floor Grate

Maintenance pit floor grating shall be 5mm by 25mm bars at 30mm on center with 3mm by 19mm cross bars at 100mm on center and designed in accordance with NAAMM MBG 531.

2.5.2 Trench Drain Grate and Mechanical Trench Grate

Trench drain grate and Mechanical Trench grate shall be designed to HS 20 in accordance with NAAMM MBG 532.

2.6 FLOOR PLATES

Floor plates shall be 6 mm thick, slip-resistant, carbon steel conforming to ASTM A 283/A 283M having a minimum static coefficient of friction of 0.50 when tested in accordance with ASTM D 2047. Wearing surface shall be aluminum oxide or silicon carbide. Floor plate panels shall be as indicated on the drawings and shall be fabricated to flush out with the Trench Drain Grate. Floor plate panels are required at areas where the Trench drain passes under CMU walls and doors (three places). These plates shall be designed in accordance with NAAMM MBG 531.

2.7 HANDRAILS AND GUARDRAILS

Handrails and Guardrails shall be designed to resist a concentrated load of 890 N (200 pounds) in any direction at any point of the top of the rail or 292 Newtons per meter (20 pounds per foot) applied horizontally to top of the rail, whichever is more severe.

2.7.1 Steel Handrails, Including Carbon Steel Inserts

Steel handrails, including inserts in concrete, shall be steel pipe conforming to ASTM A 53/A 53M. Steel railings shall be 40 mm nominal size. Railings shall be hot-dip galvanized and field painted. Pipe collars shall be hot-dip galvanized steel.

Joint posts, rail, and corners shall be fabricated by one of the following methods:

- (1) Mitered and welded joints by fitting post to top rail and intermediate rail to post, mitering corners, groove welding joints, and grinding smooth. Railing splices shall be butted and

reinforced by a tight fitting interior sleeve not less than 150 mm long.

(2) Railings may be bent at corners in lieu of jointing, provided bends are made in suitable jigs and the pipe is not crushed.

2.8 LADDERS

Ladders shall be galvanized steel , fixed rail type in accordance with ANSI A14.3.

2.9 MIRROR FRAMES

Frames for plate glass mirrors larger than 450 by 750 mm shall be fabricated from extruded aluminum with anodized finish. Frames shall be provided with concealed fittings and tamperproof mountings.

2.10 MISCELLANEOUS

Miscellaneous plates and shapes for items that do not form a part of the structural steel framework, such as lintels, sill angles, miscellaneous mountings, and frames, shall be provided to complete the work.

2.11 WIRE PARTITIONS, DIAMOND MESH TYPE

Wire partitions shall be constructed of metal fabric attached to structural steel framing members. Fabric shall be 8gauge steel wires woven into 38 mm diamond mesh with wire secured through weaving channels. Framing members shall be channels 38 by 3 mm minimum size. Channel frames shall be mortised and tenoned at intersections. Steel frames, posts, and intermediate members shall be of the sizes and shapes indicated. Cast-iron floor shoes and caps shall have setscrew adjustment.

2.12 ROOF SCUTTLES Amendment #0003 and GUARDRAIL

Roof scuttles shall be of galvanized steel not less than 2.0 mm (14 gauge), with 75 mm beaded flange welded and ground at corners. Scuttle shall be sized to provide minimum clear opening of 940 by 760 mm. Cover and curb shall be insulated with 25 mm thick rigid insulation covered and protected by galvanized steel liner not less than 0.55 mm (26 gauge). The curb shall be equipped with an integral metal cap flashing of the same gauge and metal as the curb, full welded and ground at corners for weathertightness.

(Amendment #0003) The curb shall be constructed to receive guard rail protection as specified below. Scuttle shall be completely assembled with heavy hinges, compression spring operators enclosed in telescopic tubes, positive snap latch with turn handles on inside and outside and neoprene draft seal. Fasteners shall be provided for padlocking on the inside. The cover shall be equipped with an automatic hold-open arm complete with handle to permit one hand release.

(Amendment # 0003) 2.22.1 Guardrail shall be model #RHSR-SS as manufactured by David/Randall Assoc. Inc. of Harleysville, PA, (877) 723-3766 or an approved equal. Finish of the guardrail assembly shall be hot dipped galvanized.

2.13 SAFETY NOSING

Safety nosings shall be of cast aluminum with cross-hatched abrasive surface. Nosing shall be 75 mm wide and terminating at not more than 150 mm from the ends of treads, except nosing for metal pan cement-filled

treads shall extend the full length of the tread. Safety nosings shall be provided with anchors not less than 19 mm long. Integrally cast mushroom anchors are not acceptable.

2.14 STEEL STAIRS

Steel stairs shall be complete with structural or formed channel stringers, metal pan cement-filled treads, landings, columns, handrails, and necessary bolts and other fastenings as indicated. Structural steel shall conform to ASTM A 36/A 36M. Stairs and accessories shall be steel, shop primed for field painting. Risers on stairs with metal pan treads shall be deformed to form a sanitary cove to retain the tread concrete. Integral nosings shall have braces extended into the concrete fill.

2.15 FIRE EXTINGUISHERS, CABINETS and BRACKETS

a. Fire Extinguisher Cabinets (FEC)

Metal fire extinguisher cabinets shall be furnished and installed where shown on the drawings or specified. Cabinets to be located in fire-rated walls shall be fire-rated type, fabricated in accordance with ASTM E 814, and shall be listed by an approved testing agency for 1- hour combustible and non-combustible wall systems. The testing agency's seal shall be affixed to each fire-rated cabinet. Cabinets shall be of the semi-recessed type suitable for 4.5 kg extinguishers. Box and trim shall be of heavy gage rolled steel. Door shall be a rigid frame with full length piano type hinge and double strength (DSA) glass panel. Door and panel shall stainless steel finish inside and out.

b. Fire Extinguisher Bracket (FE)

Provide a fire extinguisher bracket of 16 guage steel, red baked enamel with spring type band and retaining clip as located on the drawings.

c. Fire Extinguishers

Provide an ABC multi-purpose dry chemical fire extinguisher at locations shown on the drawings for all fire extinguisher cabinets and brackets. The extinguisher shall meet NFPA codes governing fire extinguishers, and shall carry a UL and FM approval. All fire extinguishers in Zones 2 and five shall be 2.27 kg and all fire extinguishers in Zones 1, 3 and 4 shall be 4.5 kg.

2.16 Dock Bumpers

Bumpers shall be resilient rubber material of rubberized fabric truck tires cut to uniform size pads and punched to receive 19 mm supporting rods. Resilient portion of the bumpers shall be 300 mm high, 525 mm wide, and 150 mm deep, minimum. Bumpers shall be 150 mm thick, minimum stand out from dock, and closed with two 75 mm by 62.5 mm by 6.25 mm structural steel angles under approximately 680 kg pressure. Angles shall be welded to 19 mm rods at one end and closed with threaded rod and nut at the other end. Anchor leg of angle shall extend 62 mm beyond the rubber surface at each end and contain two or three 20 mm anchor bolt holes. Anchor the legs to the dock wall with preset 19 mm by 200mm cadmium plated J bolts or hex head bolts, nuts, and washers.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

All items shall be installed at the locations shown and according to the manufacturer's recommendations. Items listed below require additional procedures as specified.

3.2 REMOVABLE ACCESS PANELS

A removable access panel not less than 300 by 300 mm shall be installed directly below each valve, flow indicator, damper, or air splitter that is located above the ceiling, other than an acoustical ceiling, and that would otherwise not be accessible.

3.3 INSTALLATION OF PIPE GUARDS (BOLLARDS)

Pipe guards shall be set vertically in concrete piers. Piers shall be constructed of, and the hollow cores of the pipe filled with, concrete specified in SECTION 03300A CAST-IN-PLACE STRUCTURAL CONCRETE.

3.4 INSTALLATION OF DOWNSPOUT BOOTS

Downspouts shall be secured to building through integral lips with appropriate fasteners.

3.5 ATTACHMENT OF HANDRAILS

Toeboards and brackets shall be installed where indicated. Splices, where required, shall be made at expansion joints. Removable sections shall be installed as indicated.

3.5.1 Installation of Steel Handrails

Installation shall be in pipe sleeves embedded in concrete and filled with molten lead or sulphur with anchorage covered with standard pipe collar pinned to post. Rail ends shall be secured by steel pipe flanges anchored by expansion shields and bolts.

3.6 WIRE PARTITION POSTS AND OPENINGS

Posts shall be set in shoes bolted to the floor and in caps tap-screwed to clip angles in overhead construction, as indicated. Openings shall be formed using channels similar to the partition frames at ducts, pipes, and other obstructions.

3.7 INSTALLATION OF SAFETY NOSINGS

Nosing shall be completely embedded in concrete before the initial set of the concrete occurs and shall finish flush with the top of the concrete surface.

3.8 TRENCH FRAMES AND COVERS

Trench frames and covers shall finish flush with the floor.

3.9 INSTALLATION OF FIRE EXTINGUISHER CABINETS AND BRACKETS

Metal fire extinguisher cabinets and brackets shall be furnished and installed in accordance with NFPA 10 where shown on the drawings or specified.

-- End of Section --

SECTION 16770A

RADIO AND PUBLIC ADDRESS SYSTEMS

AM#0003

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ELECTRONIC INDUSTRIES ALLIANCE (EIA)

EIA ANSI/EIA/310-D

(1992) Cabinets, Racks, Panels, and
Associated Equipment

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70

(1999) National Electrical Code

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Radio and Public Address System;
Installation;

Detail drawings consisting of a complete list of equipment and material, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Detail drawings shall also contain complete wiring and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Drawings shall show proposed layout of equipment and appurtenances, and equipment relationship to other parts of the work including clearances for maintenance and operation.

Detail drawings consisting of a complete list of equipment and material, including manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Detail drawings shall also contain complete wiring and schematic diagrams and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Drawings shall show proposed layout of equipment and appurtenances, and equipment relationship to other parts of the work including clearances for maintenance and operation.

SD-03 Product Data

Spare Parts;

Spare parts data for each different item of material and equipment specified, after approval of the detail drawings and not later than 3 months prior to the date of beneficial occupancy. The data shall include a complete list of parts and supplies, with current unit prices and source of supply.

SD-06 Test Reports

Approved Test Procedures;

Test plan and test procedures for the acceptance tests. The test plan and test procedures shall explain in detail, step-by-step actions and expected results to demonstrate compliance with the requirements specified. The procedure shall also explain methods for simulating the necessary conditions of operation to demonstrate system performance.

Acceptance Tests;

Test reports in booklet form showing all field tests performed to adjust each component and to prove compliance with the specified performance criteria, upon completion and testing of the installed system. The reports shall include the manufacturer, model number, and serial number of test equipment used in each test. Each report shall indicate the final position of controls and operating mode of the system.

SD-10 Operation and Maintenance Data

Radio and Public Address System;

Six copies of the operation manual outlining the step-by-step procedures required for system start up, operation, and shutdown. The manual shall include equipment layout and schematics of simplified wiring and control diagrams of the system as installed, the manufacturer's name, model number, and brief description of all equipment and their basic operating features. Six copies of maintenance manual listing routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides. The manual shall include equipment layout and schematics and simplified wiring and control diagrams of the system.

1.3 SYSTEM DESCRIPTION

The radio and public address system shall consist of an audio distribution network to include amplifiers, mixers, microphones, speakers, cabling, and any ancillary components required to meet the required system configuration and operation.

1.3.1 Single Channel System

The system shall control and amplify an audio program for distribution within the areas indicated. Components of the system shall include a mixer-amplifier microphone speaker system cabling, and other associated hardware.

1.3.2 System Performance

The system shall provide even sound distribution throughout the designated area, plus or minus 3 dB for the 1-octave band centered at 4000 Hz. The system shall provide uniform frequency response throughout the designated area, plus or minus 3 dB as measured with 1/3-octave bands of pink noise at locations across the designated area selected by the Contracting Officer. The system shall be capable of delivering 75 dB average program level with additional 10 dB peaking margin sound pressure level (SPL) to any location in the area at an acoustic distortion level below 5 percent total harmonic distortion (THD). Unless otherwise specified the sound pressure reference level is 20 micro Pascal (0.00002 Newtons per square meter).

1.4 DELIVERY AND STORAGE

Equipment placed in storage until installation time shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, and other contaminants.

1.5 VERIFICATION OF DIMENSIONS

The Contractor shall become familiar with the details of the work and working conditions, shall verify dimensions in the field, and shall advise the Contracting Officer of any discrepancies before performing the work.

PART 2 PRODUCTS

2.1 STANDARD PRODUCTS

Material and equipment to be provided shall be the standard products of a manufacturer regularly engaged in the manufacture of such products, and shall essentially duplicate material and equipment that have been in satisfactory use at least 2 years. All components used in the system shall be commercial designs that comply with the requirements specified. Equipment shall be supported by a service organization that is, in the opinion of the Contracting Officer, reasonably convenient to the site.

2.1.1 Identical Items

Items of the same classification shall be identical. This requirement includes equipment, modules, assemblies, parts, and components.

2.1.2 Nameplates

Each major component of equipment shall have the manufacturer's name, address, model and catalog number, and serial number on a plate secured to the equipment.

2.2 MIXER AMPLIFIER

Mixer amplifier shall as a minimum conform to the following specifications:

Rated Power Output:	100	watts RMS
Frequency Response:	Plus or Minus 2 dB,	60-13,000 Hz
Distortion:	Less than 1 percent at RPO,	60 - 13,000 Hz

Inputs: 2 microphones (high impedance or
low-impedance unbalanced
2 Aux. (high-impedance)

Output Impedance: Balanced 4, 8, and 16 ohms

Output Voltage: 25 and 70 volts

Power Requirement: 110-125 Vac 60 Hz

2.3 MICROPHONES

Microphones shall as a minimum conform to the following specifications:

Application: Desk

Element: Dynamic

Frequency Response: 50 - 12,000 Hz

Impedance: 250 ohms (nominal)

Front-to-back Ratio: 20 dB

2.3.1 Microphone Jack

Each outlet for microphones shall consist of a standard outlet box, flush-mounted, and fitted with a three-pole, polarized, locking-type, female microphone jack and a corrosion resistant-steel device plate.

2.4 LOUDSPEAKERS

2.4.1 Cone Speaker

The cone speaker shall as a minimum conform to the following specifications:

Application: Ceiling

Frequency range: 60 to 12,000 Hz

Power Rating: Normal - 7 watts
Peak - 10 watts

Voice Coil Impedance: 8 ohms

Line Matching
Transformer Type: 25/70 volt line

Capacity: 2 watts

Magnet: 8 ounces or greater

Primary Taps: 0.5, 1, and 2 watts

Primary Impedance: 25 volts - 1250, 625, and 312 ohms
70 volts - 10k, 5k, and 2.5k ohms

Frequency Response: 30 - 20,000 Hz

Insertion Loss: Less than 1 dB

2.4.2 Horn Speaker

The horn speaker shall as a minimum conform to the following specifications:

Application: Weatherproof

Frequency Response: 400 - 14,000 Hz

Power Taps: 70 volt line -.9, 1.8, 3.8, 7.5,
and 15 watts

Impedance: 5000, 2500, 1300, 670, 330, 90, and 45
ohms

Power Rating: Normal - 7 watts
Peak - 15 watts

2.5 SPEAKER SWITCHING PANEL

Zone control shall be provided for the paging function. The speaker switching panel shall contain at least 6 double-pole, 3- position lever-type selector switches with mechanical detents and shall be rack-mounted. A designation strip shall be provided. Power supply shall be provided for priority relays and controls, rack-mounted and sized for a capacity equal to 200 percent of the as-built control system, and shall operate at 24 or 48 Vdc. Input and output shall be protected to permit Class 2 wiring in accordance with NFPA 70.

2.6 PRIORITY RELAYS AND CONTROLS

Priority relays and controls required to accomplish operations specified shall be provided. Relays shall be completely enclosed with a plastic dust cover for maximum protection against foreign matter, and shall be plug-in type. Relays shall be provided with a diode wired across the relay coil for transient suppression and shall be installed utilizing factory-prewired, rack-mounted receptacle strips. Coil shall be maximum 24 volts dc.

2.7 SWITCHES AND CONTROLS

DELETED (AM#3)

2.8 EQUIPMENT RACKS

Equipment shall be mounted on 482.6 mm (19 inch) racks in accordance with EIA ANSI/EIA/310-D and located as shown on drawings. Ventilated rear panels, solid side panels, and solid top panels shall be provided. Perforations or louvers may be provided in front panels to ensure adequate ventilation of equipment. The racks and panels shall be factory finished with a uniform baked enamel over rust inhibiting primer.

2.9 SPEAKER AND MICROPHONE CABLE

Cables shall be of the gauge required depending upon the cable run length. In no case shall any cable be used which is smaller than 20 AWG. Insulation on the conductors shall be polyvinyl chloride (PVC) or an equivalent synthetic thermoplastic not less than 0.2 mm (0.009 inch). Cables shall be shielded with a 34-gauge tinned soft copper strand formed into a braid. Cables shall be jacketed with a PVC or Fluoropolymer compound. The jacket thickness shall be 0.5 mm (0.0200 inch) minimum.

2.10 POWER SURGE PROTECTION

Major components of the system such as power amplifiers, mixer-preamplifiers, phonographs, and tuners, shall have a device, whether internal or external, which provides protection against voltage spikes and current surges originating from commercial power sources.

2.11 SIGNAL SURGE PROTECTION

Major components of the system shall have internal protection circuits which protects the component from mismatched loads, direct current, and shorted output lines.

PART 3 EXECUTION

3.1 INSTALLATION

All equipment shall be installed as indicated and specified, and in accordance with the manufacturer's recommendations except where otherwise indicated. Equipment mounted out-of-doors or subject to inclement conditions shall be weatherproofed.

3.1.1 Equipment Racks

Racks shall be mounted side-by-side and bolted together. Items of the same function shall be grouped together, either vertically or side-by-side. Controls shall be symmetrically arranged at a height as shown. Audio input and interconnections shall be made with approved shielded cable and plug connectors; output connections may be screw terminal type. All connections to power supplies shall utilize standard male plug and female receptacle connectors with the female receptacle being the source side of the connection. Inputs, outputs, interconnections, test points, and relays shall be accessible at the rear of the equipment rack for maintenance and testing. Each item shall be removable from the rack without disturbing other items or connections. Empty space in equipment racks shall be covered by blank panels so that the entire front of the rack is occupied by panels.

3.1.2 Wiring

Wiring shall be installed in rigid conduit, intermediate metal conduit, cable trays, or electric metallic tubing as specified in Section 16415 ELECTRICAL WORK, INTERIOR. Wiring for microphone, grounding, line level, video, speaker and power cables shall be isolated from each other by physical isolation and metallical shielding. Shielding shall be terminated at only one end.

3.2 GROUNDING

All grounding practices shall comply with NFPA 70. The antenna mast shall be separately grounded. The system shall utilize a multiple-point signal

grounding scheme where conductive path connections are required between each piece of equipment and the reference ground point. An isolated ground bar for power shall be provided for the connection of the main system components. The ground bar shall be connected to the main service ground utilizing a No. 6 conductor.

3.3 ACCEPTANCE TESTS

After installation has been completed, the Contractor shall conduct acceptance tests, utilizing the approved test procedures, to demonstrate that equipment operates in accordance with specification requirements. The Contractor shall notify the Contracting Officer 30 days prior to the performance of tests. In no case shall notice be given until after the Contractor has received written Contracting Officer approval of the test plans as specified. The acceptance tests shall include originating and receiving messages at specified stations, at proper volume levels, without cross talk or noise from other links or nondesignated units.

3.4 TRAINING

The Contractor shall conduct a training course for 1 members of the operating and maintenance staff as designated by the Contracting Officer. The training course will be given at the installation during normal working hours for a total of 8 hours and shall start after the system is functionally complete but prior to final acceptance tests. The field instructions shall cover all of the items contained in the approved operating and maintenance manuals, as well as demonstrations of routine maintenance operations. The Contracting Officer shall be notified at least 14 days prior to the start of the training course.

-- End of Section --