

STRUCTURAL NOTES

A. DESIGN LOADS

1. WIND LOAD :	20 PSF
2. LIVE LOADS:	
ROOF:	30 PSF
STORES, OFFICES:	100 PSF
STAIRS, CORRIDORS, LOBBIES:	100 PSF
MECHANICAL ROOMS:	150 PSF
ALL OTHER AREAS:	100 PSF

B. SOIL VALUE

MINIMUM REQUIRED ALLOWABLE SAFE SOIL BEARING CAPACITY:	
3,000 PSF	ON ORIGINAL UNDISTURBED SOIL
3,000 PSF	ON COMPACTED GRANULAR CONTROLLED FILL

ALL EXTERIOR FOOTINGS ON UNDISTURBED SOIL SHALL BE A MINIMUM OF 2'-6" BELOW FINISHED EXTERIOR GRADE. FOOTINGS SHALL STEP WHEN REQUIRED AT A MAXIMUM SLOPE OF ONE UNIT VERTICALLY TO TWO UNITS HORIZONTALLY. THE HORIZONTAL DISTANCE BETWEEN STEPS SHALL NOT BE LESS THAN 1'-4". FOOTING ELEVATIONS HAVE BEEN ESTABLISHED FROM AVAILABLE INFORMATION AND SHALL NOT BE CONSTRUED AS WAIVING ANY OF MINIMUM REQUIREMENTS STATED ABOVE.

C. CONCRETE

1. STRUCTURAL CONCRETE SHALL CONFORM TO ACI 318-89

2. CONCRETE SHALL CONFORM TO THE TYPE OF MIX DESIGNATED BELOW AND SHALL PROVIDE 28 DAY ULTIMATE COMPRESSIVE STRENGTH NOTED FOR EACH TYPE OF MIX:

$f'_c = 3000$ PSI NORMAL WEIGHT - TYPICAL UNLESS OTHERWISE NOTED
 $f'_c = 3000$ PSI NORMAL WEIGHT - ALL OTHER CONCRETE EXPOSED TO WEATHER : AIR ENTRAINED 6%

3. SLOPE TOP OF CONCRETE SLABS TO DRAIN WHERE SHOWN IN ACCORDANCE WITH ARCHITECTURAL DRAWINGS.

4. LOCATE AND VERIFY ALL POCKETS, RECESSES, SLEEVES, ANCHOR BOLTS AND OPENINGS IN CONCRETE FOR RELATED TRADES PRIOR TO SETTING FORMS. THESE ITEMS SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

D. CONCRETE REINFORCEMENT

1. REINFORCING STEEL SHALL CONFORM TO ASTM A615-89, GRADE 60. FABRICATE AND PROVIDE STANDARD SUPPORTING ACCESSORIES IN ACCORDANCE WITH ACI DETAILING MANUAL-1988, ACI 315-80 (REVISED 1986). WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185-85, LAP EDGES OF WIRE FABRIC AT LEAST 6" IN EACH DIRECTION.

UNLESS OTHERWISE NOTED, ALL SLABS ON GRADE SHALL HAVE A MINIMUM OF ONE LAYER OF 6X6-W2.9 X W2.9 WELDED WIRE FABRIC AT 2-INCHES FROM TOP OF SLAB.

2. CONCRETE PROTECTION FOR REINFORCEMENT: MINIMUM COVER FOR REINFORCING STEEL SHALL BE:

- 3/4" IN SLABS AND IN WALLS AT FACES NOT EXPOSED TO WEATHER
- 1-1/2" IN BEAMS AT BOTTOM AND SIDES; AND IN PEDESTALS
- 1-1/2" IN SLABS AT BOTTOM POURED ON PROTECTIVE SLAB
- 2" IN ALL MEMBERS EXPOSED TO WEATHER OR EARTH BACKFILL
- 3" IN ALL CONCRETE POURED AGAINST EARTH

E. MASONRY WALLS

1. MASONRY VENEER SHALL CONSIST ENTIRELY OF UNITS CONFORMING TO THE FOLLOWING SPECIFICATIONS:

FACE BRICK = ASTM C216, GRADE SW. TYPE FBSTM C 90-85

2. PROVIDE MASONRY TIES; SEE ARCHITECTURAL DETAILS AND SPECIFICATIONS.

3. USE TYPE "S" PORTLAND CEMENT-LIME MORTAR FOR ALL MASONRY WALLS.

F. STRUCTURAL STEEL

1. STRUCTURAL STEEL SHALL CONFORM TO AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" LATEST EDITION.

2. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A36-89, UNLESS OTHERWISE NOTED. STRUCTURAL TUBING SHALL BE COLD FORMED WELDED STRUCTURAL STEEL TUBING CONFORMING TO ASTM A500-89 GRADE B, AND SHALL HAVE A MINIMUM YIELD STRENGTH OF 46 KSI.

3. SEE ARCHITECTURAL DRAWINGS FOR ALL REQUIRED MISCELLANEOUS AND PREFABRICATED METAL NOT SHOWN ON STRUCTURAL DRAWINGS.

4. ALL SHOP CONNECTIONS SHALL BE PREQUALIFIED WELDED CONNECTIONS. FIELD CONNECTIONS SHALL BE AISC STANDARD BOLTED CONNECTIONS USING MINIMUM 3/4" DIAMETER HIGH STRENGTH BOLTS CONFORMING TO STEM A 325. WELDINGS SHALL CONFORM TO THE STRUCTURAL WELDING CODE, ANSI/AWS D1.1-92 OF THE AMERICAN WELDING SOCIETY. UNLESS NOTED OTHERWISE, ALL BEAM BEARINGS ON MASONRY SHALL HAVE MINIMUM 3/8" X 8" X 0"8" BEARING PLATE AND THREE COURSES OF SOLID BRICK BELOW EACH BEARING.

EXCEPT WHERE ENCASED IN CONCRETE, ALL STRUCTURAL STEEL SHALL BE PAINTED WITH ONE SHOP COAT OF RUST INHIBITING PRIMER AND A COAT OF FIELD FINISH PAINT.

5. GENERAL CONTRACTOR SHALL COORDINATE THE FINAL LOCATIONS OF ALL SUSPENDED EQUIPMENT WITH THE APPROVED MECHANICAL SHOP DRAWINGS. STEEL SHOP DRAWINGS ON SUBMITTALS SHALL REFLECT LOCATIONS, DIMENSIONS AND DETAILS OF ALL EQUIPMENT SUPPORTS.

6. MECHANICAL HANGERS: PROVIDE ROD OR ANGLE HANGERS FOR ALL CEILING HUNG MECHANICAL UNITS, DUCTS AND PIPES AS REQUIRED, UNLESS OTHERWISE NOTED. ALL ROD HANGERS SHALL BE 1/2" DIAMETER RODS FOR MECHANICAL UNITS WITH MINIMUM ONE ROD AT EACH CORNER OF THE UNIT; 3/8" DIAMETER RODS FOR DUCTS AND PIPES ONLY. PROVIDE ALL NECESSARY CLAMPS, STRAPS, AND FASTENERS AS REQUIRED. SUCH ITEMS SHALL HAVE A LOAD CARRYING CAPACITY WITH A MINIMUM SAFETY FACTOR OF 4.0. L 2-1/2 X 2-1/2 X 1/4 MAY BE USED IN LIEU OF 1/2" DIAMETER ROD, AND L 1-1/2 X 1-1/2 X 3/16 MAY BE USED IN LIEU OF 3/8" DIAMETER ROD. ALL HANGERS SHALL BE SUPPORTED BY BOTTOM FLANGE OF STEEL BEAMS OR BOTTOM CHORD OF STEEL JOISTS AT THE PANEL POINTS ONLY. ALL HANGERS SHALL BE IN ACCORDANCE WITH FEDERAL SPECIFICATION WW-H-171D, "HANGERS AND SUPPORTS, PIPE", AND THE CONTRACT SPECIFICATIONS.

7. STEEL LINTELS: UNLESS OTHERWISE NOTED, PROVIDE ONE ANGLE FOR EACH 4" OF NON-BEARING MASONRY WALL AS FOLLOWS:

OPENINGS UP TO 3'-5"	4"X3-1/2"X1/4" ANGLE (LLV) (USE 5/16" THICK FOR EXTERIOR LINTELS)
OPENINGS 3'-6" TO 5'-11"	5"X3-1/2"X5/16" ANGLE (LLV)

FOR ANGLE LINTELS, 3-1/2" LEG TO BE HORIZONTAL, PROVIDE 5" BEARING EACH END.

8. HEADERS: PROVIDE HEADER L 5"X3-1/2"X5/16" AT EACH SIDE OF EACH ROOF OPENING, UNLESS OTHERWISE NOTED. PROVIDE ANGLE HANGER 6"X4"X3/8"X0'-6" AT EACH END OF EACH HEADER WELDED ANGLE.

9. ROOF AND FLOOR OPENINGS AND HANGING EQUIPMENT ARE SCHEMATICALLY SHOWN. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE FINAL LOCATIONS OF THESE ITEMS WITH THE MECHANICAL SHOP DRAWINGS PRIOR TO SUBMISSION OF SAME FOR REVIEW AND APPROVAL. STEEL SHOP DRAWINGS ON SUBMITTALS SHALL REFLECT LOCATIONS, DIMENSIONS AND DETAILS OF ALL OPENINGS AND SUPPORTS.

G. STEEL JOISTS

1. OPEN WEB STEEL JOISTS SHALL BE K SERIES AND SHALL CONFORM TO THE LATEST SPECIFICATIONS OF THE STEEL JOIST INSTITUTE

2. JOISTS SHALL BE WELDED TO STEEL SUPPORTS WITH A MINIMUM OF TWO-1" WELDS. MINIMUM BEARING SHALL BE 2-1/2" ON STEEL AND 4" ON MASONRY. PROVIDE WELD PLATE WITH ANCHOR FOR JOISTS BEARING ON MASONRY BOND BEAM.

3. PROVIDE BRIDGING IN ACCORDANCE WITH SJI STANDARDS SPECIFICATIONS. ANCHOR ENDS OF BRIDGING LINES TO MASONRY WALLS. ALL BRIDGING SHALL BE PLACED AND ANCHORED BEFORE INSTALLATION OF DECK.

4. EXTEND BOTH BOTTOM CHORD ANGLES OF JOISTS ON COLUMN CENTERLINES FOR CONNECTION TO COLUMNS. PROVIDE ERECTION BOLTS FOR JOISTS ON COLUMN CENTERLINES FOR TEMPORARY FRAME STABILITY. WELD JOISTS TO SUPPORTING STEEL PER MINIMUM SJI REQUIREMENTS UNLESS DETAILED OTHERWISE. PROVIDE TOP CHORD EXTENSIONS AND SPECIAL JOIST SEATS AS REQUIRED BY DRAWINGS.

5. NO MECHANICAL EQUIPMENT OR SPECIAL APPURTENANCE SHALL BE PLACED ON JOISTS WITHOUT APPROVAL OF ENGINEER. NO EQUIPMENT MAY BE SUPPORTED FROM BOTTOM CHORD OF THE JOIST AND NO LOAD MAY BE SUPPORTED BETWEEN TOP CHORD PANEL POINT, UNLESS OTHERWISE SHOWN.

6. ALL JOISTS DAMAGED BY METAL DECK WELDING SHALL BE REPLACED OR REPAIRED BY CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER/GOVERNMENT

H. METAL DECK

1. STEEL DECK SHALL BE MADE FROM STEEL CONFORMING TO ASTM A811 GRADE C, D, OR E, (FOR PAINTED DECK) OR A446 GRADE A, B, C, D, E, OR F (FOR GALVANIZED DECK) HAVING A MINIMUM YIELD STRENGTH OF 33,000 PSI. SECTION PROPERTIES SHALL BE IN ACCORDANCE WITH THE AMERICAN IRON AND STEEL INSTITUTE'S SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, LATEST EDITION, AND SHALL BE CERTIFIED BY THE STEEL DECK INSTITUTE.

2. METAL DECK SHALL BE OF DEPTH AND GAUGE, WITH THE MINIMUM SECTION MODULUS AND MOMENT OF INERTIA AS NOTED ON DRAWINGS. PROVIDE GALVANIZED ROOF DECK UNLESS OTHERWISE NOTED.

3. STEEL DECK SHALL BE ERECTED AND FASTENED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND ERECTION LAYOUTS. PUDDLE WELDS SHALL BE AT LEAST 5/8" IN DIAMETER, OR ELONGATED, HAVING EQUAL PERIMETER. FILLET WELDS WHEN USED SHALL BE APPROXIMATELY 1" LONG. WELD METAL

SHALL PENETRATE ALL LAYERS OF DECK MATERIAL AT END LAPS AND SIDE JOINTS AND HAVE GOOD FUSION TO THE SUPPORTING MEMBERS FASTENING AT SUPPORTS SHALL BE AT ALL EDGE RIBS PLUS A SUFFICIENT NUMBER OF INTERIOR RIBS TO LIMIT THE SPACING BETWEEN ADJACENT POINTS OF ATTACHMENT TO 18 INCHES. SIDE LAPS OF INDIVIDUAL SHEETS SHALL BE FASTENED TOGETHER BETWEEN SUPPORTS NOT EXCEEDING 3 FEET ON CENTER FOR SPANS GREATER THAN 5 FEET. END LAPS OF SHEETS SHALL BE A MINIMUM OF 2 INCHES AND SHALL OCCUR OVER SUPPORTS.

I. COLD FORMED STEEL

1. ALL WORK SHALL MEET THE REQUIREMENTS OF THE FOLLOWING: AMERICAN IRON AND STEEL INSTITUTE (A.I.S.I.) DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, LATEST EDITION.

J. SHOP DRAWINGS

SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BEFORE FABRICATION OF REINFORCING STEEL, STRUCTURAL STEEL, METAL DECKING, STEEL JOISTS.

K. MISCELLANEOUS

1. PROVIDE NECESSARY INSERTS, SLEEVES, CLIPS, ANCHORS AND MISCELLANEOUS DEVICES AS MAY BE REQUIRED FOR CONSTRUCTION. DIMENSION AND LOCATION OF THESE ITEMS SHALL BE VERIFIED BEFORE CONCRETE IS POURED.

2. PIPES AND PIPE SLEEVES THROUGH WALLS AND SLABS BELOW GRADE SHALL BE WELL CAULKED FOR WATER-TIGHTNESS AT BOTH ENDS OF SLEEVES. SLEEVES THROUGH CONCRETE SLAB SHALL BE SPACED NOT CLOSER THAN 6" CLEAR OF EACH OTHER. SLEEVES SHALL BE INSTALLED PRIOR TO PLACING OF CONCRETE. NO HOLES SHALL BE MADE THROUGH HARDENED CONCRETE WITHOUT THE AUTHORIZATION OF THE ENGINEER. NO HOLES SHALL BE MADE THROUGH ANY STEEL BEAM OR GIRDER UNLESS OTHERWISE INDICATED IN CONTRACT DRAWINGS. ALL OPENINGS IN STEEL BEAMS SHALL BE SHOP MADE AND SHALL BE SHOWN ON SHOP DRAWINGS. REINFORCE BEAM WEB WITH 3/8- INCH STIFFENER PLATE AROUND OPENING AS REQUIRED.

3. UTILITY LINES PASSING UNDER FOOTINGS SHALL BE PROTECTED WITH CONCRETE COVER OF MINIMUM AT SIDES AND BOTTOM OF LINE AND UP TO BOTTOM OF FOOTING STRUCTURE.

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Drawing Title
STRUCTURE NOTES

Approved: Area Director

Approved: Cemetery Director

Project Title
SYSTEMS INTEGRATION CENTER

Building Number

Checked

Drawn
 AES/AMC

Department of Veterans Affairs
 National Cemetery System
 Quantico National Cemetery, Virginia

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S-1

Sheet
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NATIONAL CEMETERY SYSTEM

