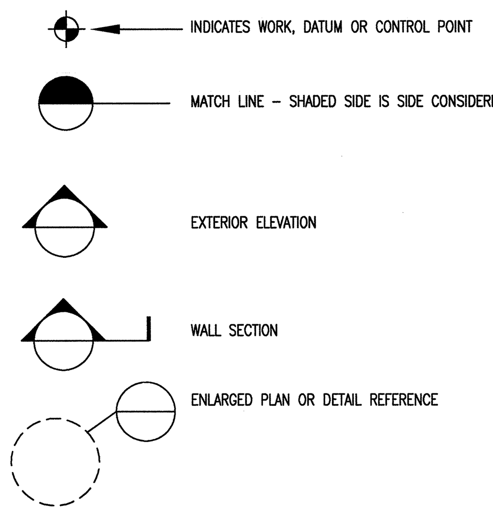
STRUCTURAL SYMBOLS



- INDICATES WORK, DATUM OR CONTROL POINT
- MATCH LINE – SHADED SIDE IS SIDE CONSIDERED
- EXTERIOR ELEVATION
- WALL SECTION
- ENLARGED PLAN OR DETAIL REFERENCE

REVISIONS

ONLY LATEST REVISION IS "CLOUDED"
LETTERS INDICATES ADDENDA
NUMBERS INDICATES BULLETINS

STRUCTURAL ABBREVIATIONS

&	AND
@	AT
ADDL	ADDITIONAL
ADJ	ADJACENT
ALT	ALTERNATE
ALUM	ALUMINUM
ANCH	ANCHOR
APPROX.	APPROXIMATE, APPROXIMATELY
ARCH	ARCHITECT
BAL	BALANCE
B, BOT, BOTT	BOTTOM
B /	BOTTOM OF
BLDG.	BUILDING
BM	BEAMV
BTWN	BETWEEN
C / C	CENTER TO CENTER
CL	CENTER LINE
CHAM	CHAMFER
CIP	CAST–IN–PLACE
CLR	CLEAR
CMU	CONCRETE MASONRY UNITS
COL	COLUMN
CONC	CONCRETE
CONST JT	CONSTRUCTION JOINT
CJ	CONTROL JOINT
CONT	CONTINUOUS, CONTINUE
COORD	COORDINATE
CTR	CENTER
D	DEPTH
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DO	DITTO (SAME AS ADJACENT)
DWG	DRAWING
EA	EACH
EF	EACH FACE
EL	ELEVATION
EOS	EDGE OF SLAB
EQ	EQUAL
ES	EACH SIDE
EXIST, (E)	EXISTING
EXP JOINT, EJ	EXPANSION JOINT
EXT	EXTERIOR
FDN	FOUNDATION
FD	FLOOR DRAIN
FIN	FINISHED
FF	FAR FACE
FS	FAR SIDE
FT	FOOT/FEET
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
GEN	GENERAL
GFE	GOVERNMENT FURNISHED EQUIPMENT
HAS	HEADED ANCHOR STUDS
HGT, H	HEIGHT
HORIZ	HORIZONTAL
HP	HIGH POINT
IN	INCH, INCHES
ID	INSIDE DIAMETER
IF	INSIDE FACE
IJ	ISOLATION JOINT
INFO	INFORMATION
INT	INTERIOR
JT	JOINT
K	KIPS (1000 POUNDS)
KSF	KIPS PER SQUARE FEET
KSI	KIPS PER SQUARE INCH
L	LENGTH
LB	POUND
LF	LINEAR FEET
LG	LONG
LONGIT	LONGITUDINAL
LP	LOW POINT
LT	LEFT
LTWT	LIGHT WEIGHT
MAX	MAXIMUM
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
NF	NEAR FACE
NIC	NOT IN CONTRACT
NO, #	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
NLWT	NORMAL WEIGHT
OC	ON CENTER / CENTERS
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPNG	OPENING
OPP	OPPOSITE
PC	PRECAST (CONCRETE)
PCF	POUNDS PER CUBIC FOOT
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PROJ	PROJECTION
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
QTY	QUANTITY
R	RADIUS
RD	ROAD
REF	REFERENCE
REINF	REINFORCE, (.ED), (.MENT)
REQD	REQUIRED
REQMT	REQUIREMENT
REM	REMAINDER
RT	RIGHT
SCHED	SCHEDULE
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SOG	SLAB ON GRADE
SPA	SPACE, SPACES
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURE, STRUCTURAL
SYM	SYMMETRY / SYMMETRICAL
T	TOP
T /	TOP OF
T / CONC, TOC	TOP OF CONCRETE
T / FTG	TOP OF FOOTING
TRANS	TRANSVERSE
T / SLAB	TOP OF SLAB
T / SOG	TOP OF SLAB ON GRADE
T / STL, TOS	TOP OF STEEL
T / WALL	TOP OF WALL
T & B	TOP AND BOTTOM
THRU	THROUGH
TYP	TYPICAL
UON	UNLESS OTHERWISE NOTED
VAR	VARIES
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WIDTH
W /	WITH
W / O	WITHOUT
WP	WORK POINT
WT	WEIGHT
WWF	WELDED WIRE FABRIC

STRUCTURAL NOTES

A. DESIGN CRITERIA:

UNLESS OTHERWISE SPECIFIED HEREIN, THE CURRENT EDITION OF THE FOLLOWING CODES, STANDARDS AND REFERENCES GOVERN DESIGN AND CONSTRUCTION:

STANDARD BUILDING CODE (SBC) – 1997
UNIFORM BUILDING CODE (UBC) – 1997 (SEISMIC DESIGN ONLY).
ASCE 7–95 (WIND DESIGN ONLY).
DOE STANDARD 1020–94.

GRAVITY LOADS

ROOF

2" COMPOSITE STEEL DECK WITH 2–1/2" LTWT TOPPING	45 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	10 PSF
ROOFING, INSULATION, BALLAST	15 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
TOTAL DEAD LOAD	80 PSF
LIVE LOAD	20 PSF

TYPICAL OFFICE AREAS

2" COMPOSITE STEEL DECK WITH 3–1/4" LTWT TOPPING	45 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	15 PSF
PARTITIONS	20 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
TOTAL DEAD LOAD	90 PSF
LIVE LOAD	50 PSF

MECHANICAL EQUIPMENT ROOMS/PENTHOUSES

2" COMPOSITE STEEL DECK WITH 4–1/2" LTWT TOPPING	70 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	15 PSF
2" FILL SLAB OVER WATERPROOFING	25 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
HANGING LOADS AT FLOOR OR ROOF ABOVE	15 PSF
TOTAL DEAD LOAD	120 PSF
LIVE LOAD	GREATER OF 150 PSF OR WEIGHT OF ACTUAL EQUIPMENT

LABORATORIES

2" COMPOSITE STEEL DECK WITH 3–1/4" LTWT TOPPING	45 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	15 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
TOTAL DEAD LOAD	70 PSF
LIVE LOAD	150 PSF

CONTROL ROOM/EQUIPMENT ROOM

2" COMPOSITE STEEL DECK WITH 3–1/4" LTWT TOPPING	45 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	15 PSF
RAISED FLOOR	15 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
TOTAL DEAD LOAD	85 PSF
LIVE LOAD	150 PSF

AUDITORIUM

2" COMPOSITE STEEL DECK WITH 3–1/4" LTWT TOPPING	45 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	15 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
TOTAL DEAD LOAD	70 PSF
LIVE LOAD (FIXED SEATING)	50 PSF
LIVE LOAD (STAGE)	125 PSF

LIBRARY

2" COMPOSITE STEEL DECK WITH 3–1/4" LTWT TOPPING	45 PSF
FRAMING STRUCTURAL STEEL SELF WEIGHT	15 PSF
CEILING, ELECTRICAL, MECHANICAL & MISCELLANEOUS	10 PSF
TOTAL DEAD LOAD	70 PSF
LIVE LOAD (STACK AREA)	125 PSF
LIVE LOAD (READING AREA)	60 PSF

BASEMENT LEVEL 1 AND 2 (SLABS–ON–GRADE)

LIVE LOAD GREATER OF 500 PSF OR 6000# FORKLIFT

WIND LOADS

WIND DESIGN TO BE PER ASCE 7–95	
BASIC WIND SPEED/GUST	90 MPH
EXPOSURE	C
IMPORTANCE FACTOR	1.00

SEISMIC LOADS

UBC SEISMIC ZONE	2A
IMPORTANCE FACTOR	1.00
DOE SEISMIC PERFORMANCE CATEGORY	PC–1

B. GENERAL

LOAD COMBINATIONS AND REDUCTIONS SHALL BE IN ACCORDANCE WITH SBC SECTION 1609 AND APPLICABLE STANDARDS FOR ALLOWABLE STRESS DESIGN EXCEPT FOR EARTHQUAKE LOADS. EARTHQUAKE LOADS DETERMINED IN ACCORDANCE WITH UBC '97 SHALL BE DIVIDED BY A FACTOR OF 1.4 PER UBC '97, SECTION 1612.3.

1. THE CONTRACTOR SHALL VISIT THE SITE AND BE FAMILIAR WITH THE SITE AND LOCAL CONDITIONS.
2. ALL DIMENSIONS AND REFERENCES INDICATED TO EXISTING CONDITIONS SHALL BE ASSUMED TO BE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY ALL DATA PERTAINING TO EXISTING CONDITIONS AS RELATED TO NEW WORK. CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH WORK.
3. THE CONTRACTOR SHALL COORDINATE WORK AND REFER TO THE CIVIL, ARCHITECTURAL, MECHANICAL, AND ELECTRICAL DRAWINGS FOR THE LOCATION AND SIZE OF OPENINGS, BLOCKOUTS, CURBS, INSERTS, ANCHOR BOLTS, AND OTHER MISCELLANEOUS ITEMS BEFORE PROCEEDING WITH STEEL FABRICATION OR CONCRETE PLACEMENT.
4. REFER TO ARCHITECTURE DRAWINGS FOR DIMENSIONS AND ELEVATIONS NOT INDICATED ON STRUCTURAL DRAWINGS.
5. DETAILS, SECTIONS AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS UNLESS OTHERWISE NOTED.
6. ELEVATIONS ARE BASED ON NGVD 1929 AND WERE TIED TO MONUMENT 95–Y–139 LOCATED AT X–10 GRID COORDINATE (N–28865.845, E–41023.264) EL. 889.70.
7. BUILDING ELEVATION 100' – 0" EQUALS NGVD DATUM 1076' – 0".

C. CONCRETE

1. CONCRETE WORK SHALL BE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE" (ACI 318–95) AND "STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301R–96).
2. SEE ARCH DWGS FOR LOCATION AND EXTENT OF ARCHITECTURAL CONCRETE
3. CONCRETE DETAILING SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL, SP 66 AND CRSI MANUAL OF STANDARD PRACTICE.
4. REINFORCING STEEL SHALL COMPLY WITH ASTM A 615, GRADE 60.
   WELDED WIRE MESH SHALL COMPLY WITH ASTM A185.
   EPOXY COATED REINFORCING STEEL SHALL COMPLY WITH ASTM A 775.
5. UNLESS OTHERWISE SHOWN, THE COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

CONCRETE CAST AGAINST EARTH	3 INCHES
CONCRETE EXPOSED TO EARTH OR WEATHER	2 INCHES
INTERIOR CONCRETE NOT EXPOSED TO EARTH OR WEATHER	1 1/2 INCHES

6. PROVIDE LAP SPLICES AND DEVELOPMENT LENGTHS AS FOLLOWS:

TENSION LAP SPLICE LENGTH

BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
TOP BARS	2'–0"	2'–8"	3'–4"	4'–0"	5'–10"	6'–8"	7'–7"	8'–6"	9'–5"
OTHER BARS	1'–7"	2'–1"	2'–7"	3'–1"	4'–6"	5'–2"	5'–10"	6'–7"	7'–3"

TENSION DEVELOPMENT LENGTH

BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
TOP BARS	1'–7"	2'–1"	2'–7"	3'–1"	4'–6"	5'–2"	5'–10"	6'–7"	7'–3"
OTHER BARS	1'–3"	1'–7"	2'–0"	2'–5"	3'–6"	4'–0"	4'–6"	5'–1"	5'–7"

NOTE:
1. ABOVE SPLICES AND DEVELOPMENT LENGTHS SHALL BE USED UNLESS THEY ARE IN CONFLICT WITH ACI 349. IN THAT CASE, USE ACI 349.
2. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.
3. SPLICES AND DEVELOPMENT LENGTHS SHOWN ARE FOR UNCOATED DEFORMED REINFORCING STEEL CONFORMING TO ASTM A615, GRADE 60.

7. CONCRETE, UNLESS OTHERWISE NOTED, SHALL BE NORMAL WEIGHT, TYPE I OR TYPE II CEMENT, COURSE AGGREGATE CONFORMING TO ASTM C 33, 145 PCF MINIMUM DENSITY, AIR ENTRAINED, WITH THE SPECIFIED 28–DAY COMPRESSIVE STRENGTH OF 4000 PSI. SLUMP OF 4 INCHES, PLUS OR MINUS ONE INCH.

   CONCRETE FOR SLAB ON COMPOSITE STEEL DECK SHALL BE LIGHTWEIGHT, TYPE I CEMENT, 115 PCF MAXIMUM DENSITY, WITH THE SPECIFIED 28–DAY COMPRESSIVE STRENGTH OF 4000 PSI.

   LEAN CONCRETE SHALL HAVE A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 1000 PSI.

8. PROVIDE CRSI, CLASS B LAP SPLICES OF THE APPROPRIATE CATEGORY WHERE REQUIRED FOR ALL HORIZONTAL WALL REINFORCEMENT, DOWELS AND SPLICES. LAP WELDED WIRE FABRIC 2 FULL PANELS MINIMUM.
9. EXPOSED FORMED CORNERS OF CONCRETE SHALL BE CHAMFERED 3/4 INCH UNLESS OTHERWISE NOTED.
10. REINFORCING BARS SHALL EXTEND 12 BAR DIAMETERS BUT NOT LESS THAN 12 INCH BEYOND BEND, UNLESS OTHERWISE NOTED.
11. CONSTRUCTION JOINTS AND/OR CONTROL JOINTS FOR WALLS SHALL NOT EXCEED 30 FEET ON CENTER SPACING.

D. STEEL

1. STRUCTURAL STEEL WORK SHALL BE IN ACCORDANCE WITH THE AISC MANUAL OF STEEL CONSTRUCTION. ALLOWABLE STRESS DESIGN, 9TH EDITION.
2. THE STEEL FRAME FOR THIS BUILDING IS CLASSIFIED AS NON–SELF SUPPORTING AND REQUIRES INTERACTION WITH OTHER COMPONENTS TO PROVIDE LATERAL STABILITY. THE CONTRACTOR SHALL DESIGN AND PROVIDE ADEQUATE TEMPORARY BRACING TO RESIST THE WIND LOADS SHOWN ON THE DRAWINGS. THE TEMPORARY BRACING SHALL REMAIN IN PLACE UNTIL THE PERMANENT BRACING, STEEL ROOF AND FLOOR DECK DIAPHRAGMS ARE INSTALLED AND ALL FINAL CONNECTIONS HAVE BEEN COMPLETED.
3. PROVIDE STRUCTURAL STEEL CONFORMING TO THE FOLLOWING STANDARDS:

W – SHAPES	ASTM	A 992 (Fy = 50 KSI)
W – SHAPES	ASTM	ASTM A572 GRADE 50
WITH SPECIAL REQUIREMENTS PER AISC TECHNICAL BULLETIN #3, DATED MARCH 1997		
STRUCTURAL PLATES & BAR	ASTM	A 36
ANGLES, M, S AND C SHAPES	ASTM	A 36
STEEL TUBE	ASTM	A 500, GRADE B
STEEL PIPE	ASTM	A 53, GRADE B
ROUND HSS	ASTM	A 500 GRADE B
SQUARE & RECTANGULAR HSS	ASTM	A 500 GRADE B
BOLTS	ASTM	A 325 (3/4 INCH DIA. UNO)
BOLTS	ASTM	A 490 (3/4 INCH DIA. UNO)
NUTS – HEAVY HEX	ASTM	A 563
WASHER	ASTM	F 436
ANCHOR BOLTS	ASTM	A 36 (UNO)
WELDS	ASTM	E70XX

4. WELDING SHALL BE PERFORMED BY CERTIFIED WELDERS USING THE SPECIFIED ELECTRODES AND SHALL CONFORM TO AWS DI.I, "STRUCTURAL WELDING CODE – STEEL"
5. BOLTED CONNECTIONS SHALL BE DETAILED WITH 3/4 INCH DIAMETER, ASTM A325, TYPE N HIGH STRENGTH BOLTS, UNLESS NOTED OTHERWISE. BOLTS SHALL BE LOAD INDICATOR TYPE WITH TWIST–OFF SPLINE.

   BOLTED CONNECTIONS FOR X–BRACING AND MOMENT FRAMES SHALL BE DETAILED WITH 3/4 INCH DIAMETER, ASTM A325, TYPE SC, HIGH STRENGTH BOLTS AND FULLY PRETENSIONED, UNLESS NOTED OTHERWISE. BOLTS SHALL BE DIRECT TENSION INDICATOR TYPE WITH TWIST–OFF SPLINE.
6. NON–SHRINK GROUT UNDER COLUMN BASE PLATES AND BEAM BEARING PLATES SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI.
7. UNLESS NOTED OTHERWISE, FILLETS WELDS SHALL BE CONTINUOUS 1/4 INCH WELDS.
8. UNLESS NOTED AS AN AWS PARTIAL PENETRATION WELD, PENETRATION WELD SYMBOLS SHALL BE EXECUTED AS COMPLETE PENETRATION WELDS WITH BACKUP BARS.
9. CUTS, HOLES, OPENINGS, ETC., REQUIRED IN STRUCTURAL STEEL FOR THE WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS SUBMITTED FOR REVIEW. BURNING OR CUTTING OF STRUCTURAL STEEL MEMBERS IN THE FIELD SHALL NOT BE ALLOWED, UNLESS ACCEPTABLE IN WRITING TO THE ARCHITECT/ENGINEER.

E. SHORING FOR STEEL GIRDERS:

1. SHORING, FOR THE PURPOSE OF MAINTAINING HORIZONTAL PLUMBNESS OF FRAMING MEMBERS, SHALL BE PROVIDED FOR ALL STEEL GIRDERS, HEREIN DEFINED TO BE ALL STEEL FRAMING MEMBERS SUPPORTING ONE OR MORE STEEL BEAMS SUPPORTING CONCRETE/METAL DECK SLAB.
2. DESIGN AND CONSTRUCTION OF SHORING IS A MEANS AND METHOD OF CONSTRUCTION AND IS THE SOLE RESPONSIBILITY OF THE GENERAL CONTRACTOR.
3. THE CONTRACTOR SHALL RETAIN A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF TENNESSEE, TO DESIGN AND PREPARE CALCULATIONS AND DRAWINGS FOR THE SHORING. 3 SEALED COPIES OF THE DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO THE CONSTRUCTION MANAGER FOR INFORMATION ONLY PRIOR TO SUBMISSION OF THE STEEL SHOP DRAWINGS. ALL SHORING LOCATIONS SHALL BE CLEARLY MARKED AND REQUIRED SECTIONS AND DETAILS PROVIDED.
4. SHORING SHALL BE EXTENDED TWO STORIES MINIMUM BELOW THE FLOOR BEING INSTALLED. ADDITIONAL SHORING, AS DEEMED NECESSARY BY THE SHORING ENGINEER, SHALL BE PROVIDED.

F. STEEL DECK

1. STEEL DECK SHALL COMPLY WITH STEEL DECK INSTITUTE, "DESIGN MANUAL FOR COMPOSITE DECKS, FORM DECKS AND ROOF DECKS".
2. COMPOSITE STEEL DECK SHALL BE 2 INCHES DEEP, 19 GAGE TYPICAL, UNLESS NOTED OTHERWISE, G–60 GALVANIZED, MINIMUM MOMENT OF INERTIA, I= 0.492 IN^4/FT. WELD TO SUPPORT STEEL AND SIDE MEMBERS WITH 5/8 INCH DIAMETER PUDDLE WELD AT 12 INCHES ON CENTER. SIDELAPS SHALL BE FASTENED AT 3 FEET ON CENTER.
3. AT LABORATORIES, HVAC ROOMS & HVAC MEZZANINES AND WALKWAY COMPOSITE STEEL DECK SHALL BE 2 INCHES DEEP, 18 GAGE, UNLESS NOTED OTHERWISE, G–60 GALVANIZED, MINIMUM MOMENT OF INERTIA, I= 0.557 IN^4/FT. WELD TO SUPPORT STEEL AND SIDE MEMBERS WITH 5/8 INCH DIAMETER PUDDLE WELD AT 12 INCHES ON CENTER. SIDELAPS SHALL BE FASTENED AT 3 FEET ON CENTER.
4. STEEL ROOF DECK SHALL BE 1.5 INCHES DEEP, 20 GAGE, TYPE B (WIDE RIB), G–60 GALVANIZED, MINIMUM MOMENT OF INERTIA, I=0.212 IN^4/FT. WELD TO SUPPORT STEEL AND SIDE MEMBERS WITH 5/8 INCH PUDDLE WELD AT 12 INCHES ON CENTER. SIDE LAPS SHALL BE FASTENED AT 18 INCHES ON CENTER WITH #10 SCREWS UNLESS NOTED OTHERWISE. THE UNDERSIDE OF THE STEEL DECK SHALL BE SHOP PRIMED PAINTED OVER PHOSPHATIZED GALVANZING.
5. LOADS EXCEEDING 50 LBS SHALL NOT BE HUNG FROM ANY COMPOSITE DECK SLABS. HANGERS FOR LOADS 50 LBS OR LESS SHALL BE NO CLOSER THAN 2 FEET 3 INCHES ON CENTER. CONNECTIONS FOR HANGERS TO COMPOSITE DECK SLABS SHALL BE SUBMITTED FOR REVIEW.
6. HANGERS FOR LOADS GREATER THAN 50 LBS FOR DUCTWORK, PIPES, ETC., SHALL BE HUNG DIRECTLY FROM STRUCTURAL STEEL MEMBERS OR SUPPLEMENTARY MEMBERS. SUPPLEMENTARY MEMBERS SHALL BE DESIGNED, DETAILED AND PROVIDED BY THE TRADE REQUIRING THE HANGER. THE HANGER LOAD, LOCATION AND CONNECTION DETAILS SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER FOR REVIEW AND ACCEPTANCE PRIOR TO INSTALLATION.

G. FOUNDATIONS:

1. FOOTING ELEVATIONS SHOWN DESIGNATE A MINIMUM DEPTH OF FOOTINGS WHERE A SAFE SOIL BEARING PRESSURE OF 3.0 KSF IS EXPECTED.
2. SOILS DATA IS TAKEN FROM "REPORT OF PHASE III GEOTECHNICAL EXPLORATION" BY LAW ENGINEERING OF KNOXVILLE, TENNESSEE, DATED JUNE 30, 2000.
3. ALL FOUNDATION EXCAVATIONS SHALL BE INSPECTED AND CERTIFIED BY A QUALIFIED SOILS TESTING FIRM. ALL REPORTS ARE TO BE SUBMITTED TO THE CONSTRUCTION MANAGER AND OWNER FOR RECORD.
4. NO FOOTING SHALL BE PLACED ONTO OR AGAINST SUBGRADES CONTAINING FREE WATER, FROST OR ICE.
5. CROSS REFERENCE ARCHITECTURAL AND STRUCTURAL DRAWINGS TO INSURE PROPER DIMENSIONS AND PLACEMENT OF ALL ANCHOR BOLTS, INSERTS, ETC.
6. BACKFILL SHALL BE AN APPROVED MATERIAL FREE OF ORGANIC MATTER AND DEBRIS, AND SHALL BE PLACED IN LAYERS NOT TO EXCEED 8 INCHES IN THICKNESS.
7. BACKFILL SHALL BE COMPACTED TO A MINIMUM OF 95% OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D–1557
8. BACKFILLING AGAINST WALLS SHALL BE DONE EVENLY ON BOTH SIDES.
9. LEVEL B1 FRAMING, DECKING AND CONCRETE SHALL BE PLACED PRIOR TO BACKFILLING AGAINST LEVEL B2 BASEMENT WALLS.
10. ALL NECESSARY CHANGES IN ELEVATION OF WALL FOOTINGS SHALL BE MADE IN STEPS NOT MORE THAN 2'–0" HIGH, 4'–0" APART, EXCEPT AS OTHERWISE SHOWN. SLOPE BOTTOM BARS IN WALLS TO FOLLOW STEPS IN FOOTINGS.

REINFORCED CONCRETE MASONRY:

1. ALL REINFORCED CONCRETE MASONRY CONSTRUCTION (MATERIALS & WORKMANSHIP) SHALL COMPLY WITH THE LATEST EDITION OF "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES", "SPECIFICATION FOR MASONRY STRUCTURES" AND THEIR COMMENTARIES (ACI 530 AND 530.1).
2. MINIMUM COMPRESSIVE STRENGTH OF MASONRY (PRISM STRENGTH), F'M = 1500 PSI
3. HOLLOW LOAD BEARING CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C 90 GRADE (N OR S), TYPE 1, WITH A MINIMUM UNIT COMPRESSIVE STRENGTH OF 1900 PSI ON THE NET SECTION.
4. MORTAR SHALL BE ASTM C 270, TYPE M OR S.
5. ALL MASONRY SHALL BE PLACED USING RUNNING BOND.
6. REINFORCING BARS FOR REINFORCED MASONRY SHALL CONFORM TO ASTM A 615, GRADE 60. REINFORCING IS TO BE CENTERED IN WALL UNLESS NOTED OTHERWISE. PLACE AND SECURE REINFORCING IN WALL PRIOR TO GROUTING.
7. HORIZONTAL JOINT REINFORCING SHALL CONFORM TO ASTM A 82.
8. GALVANIZED FINISH SHALL CONFORM TO ASTM A 153.
9. GROUT SHALL CONFORM TO ASTM C 476. MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
10. JOINT REINFORCING: 9 GAUGE, LADDER TYPE, GALVANIZED REINFORCING PLACED CONTINUOUSLY AT 16" ON CENTER IN BED JOINTS. INSTALL AT 8" ON CENTER FOR 24" ABOVE LINTELS AND BELOW OPENINGS AND FLOORS. INSTALL AT 8" ON CENTER FOR 24" ABOVE FLOORS. LAP 8" AT ENDS AND MAKE CONTINUOUS AROUND CORNERS AND AT INTERSECTIONS.
11. DEFORMED BAR REINFORCING: PLACEMENT AS INDICATED ON DRAWINGS. WHERE NOT OTHERWISE INDICATED, PROVIDE ONE #5 HORIZONTAL AT TOP AND BOTTOM OF EACH OPENING WITH A 2 FT. MINIMUM EXTENSION PAST EACH SIDE, AND ONE #5 VERTICAL, FULL HEIGHT AT EACH SIDE OF EACH OPENING, ALL UNSUPPORTED EDGES AND EACH SIDE OF EACH CORNER, CONTROL AND/OR EXPANSION JOINT.
12. SUBMIT, FOR REVIEW, DETAILED AND CHECKED SHOP DRAWINGS FOR ALL REINFORCING, AND MASONRY WALL ELEMENT LAYOUTS, AND INSTALLATION PROCEDURES INCLUDING GROUTING PROCEDURES. LAY OUT REINFORCING SO AS TO MINIMIZE THE NUMBER OF INTERRUPTED BARS AT OPENINGS.
13. PROVIDE AN ADDITIONAL CONTINUOUS BAR FOR EACH INTERRUPTED BAR AT AN OPENING. PLACE HALF OF THE ADDITIONAL BARS AT EACH SIDE OF THE OPENING.
14. VERTICAL CELLS TO BE FILLED WITH GROUT SHALL BE ALIGNED TO PROVIDE A CONTINUOUS, UNOBSTRUCTED OPENING OF THE DIMENSIONS SHOWN ON THE PLANS. CELLS WHICH WILL CONTAIN VERTICAL REINFORCEMENT SHALL HAVE A MINIMUM TWO (2) INCH CLEAR OPENING.
15. ALL BARS SHALL BE COMPLETELY EMBEDDED IN MORTAR OR GROUT. ALL BARS SHALL HAVE A COVERAGE TO THE MASONRY FACE OF NOT LESS THAN 2".
16. GROUT FOR FILLING REINFORCED OR NON–REINFORCED CELLS SHALL BE PLACED IN MAXIMUM 4'–0" LIFTS, AND CONSOLIDATED IN PLACE BY VIBRATION OR OTHER METHODS WHICH INSURE COMPLETE FILLING OF THE CELLS. ALL CELLS CONTAINING REINFORCING BARS AND/OR ANCHOR BOLTS SHALL BE FULLY GROUTED.
17. BEARING ZONES FOR LINTELS, ETC. SHALL EXTEND 8" MINIMUM AND OVER A MINIMUM OF TWO (2) COURSES OF SOLID MASONRY OR TWO (2) COURSES OF HOLLOW MASONRY GROUTED SOLID.
18. ALL REINFORCEMENT SHALL BE LAP SPLICED A MINIMUM OF 48 BAR DIAMETERS, (1'–0" MINIMUM), AT SPLICES, INTERSECTIONS AND CORNERS.
19. ALL CUTTING AND FITTING OF MASONRY, INCLUDING THAT REQUIRED TO ACCOMMODATE THE WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND SHALL BE DONE WITH MASONRY SAWS.
20. PROVIDE ADEQUATE, TEMPORARY BRACING, AS REQUIRED FOR ALL MASONRY WALLS DURING CONSTRUCTION, TO WITHSTAND ALL LOADS AND/OR THE PRESSURES OF FLUID GROUTING.
21. CONCRETE MASONRY SHALL BE PROTECTED FROM ABSORBING MOISTURE AND WATER WHILE AT THE PLANT, DURING SHIPMENT AND AT THE SITE DURING CONSTRUCTION.
22. ANCHORS, WALL PLUGS, ACCESSORIES AND OTHER ITEMS TO BE BUILT–IN SHALL BE INSTALLED AS THE MASONRY WORK PROGRESSES.
23. SPECIAL INSPECTION IS REQUIRED FOR ALL LOAD–BEARING MASONRY CONSTRUCTION.
24. SEE SPECIFICATIONS FOR TESTING REQUIREMENTS DURING CONSTRUCTION.
25. CHASES SHALL BE BUILT INTO WALLS, NOT CUT IN. CHASES SHALL BE PLUMB AND SHALL BE A MINIMUM OF ONE (1) MASONRY UNIT LENGTH FROM JAMBS OF WALL OPENINGS. NO CHASES OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL BE CONSTRUCTED WITHOUT PRIOR REVIEW OF THE ARCHITECT.
26. CONTROL JOINTS IN REINFORCED MASONRY WALLS SHALL BE LOCATED AS FOLLOWS UNLESS OTHERWISE NOTED:
    1) AT CHANGES IN HEIGHT OR THICKNESS
    2) AT CHASES AND RECESSES FOR PIPING, COLUMNS, FIXTURES, ETC.
    3) MAXIMUM OF 40'–0" ON CENTER
    4) MAXIMUM OF 20'–0" FROM CORNERS
    5) AT COLUMN LOCATIONS.

NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, IS MADE AS TO THE ACCURACY, COMPLETENESS OR USEFULNESS OF THE INFORMATION OR STATEMENTS CONTAINED IN THESE DRAWINGS, OR THAT THE USE OR DISCLOSURE OF ANY INFORMATION, APPARATUS, METHOD, OR PROCESS DISCLOSED IN THESE DRAWINGS MAY NOT INFRINGE PRIVATE RIGHTS OF OTHERS. NO LIABILITY IS ASSUMED WITH RESPECT TO THE USE OF, OR FOR DAMAGES RESULTING FROM THE USE OF ANY INFORMATION, APPARATUS, METHOD, OR PROCESS DISCLOSED IN THESE DRAWINGS. DRAWINGS MADE AVAILABLE FOR INFORMATION TO BIDDER ARE NOT TO BE USED FOR OTHER PURPOSES AND ARE TO BE RETURNED UPON REQUEST OF THE FORWARDING CONTRACTOR.

SECTION AND DETAIL KEY: NUMBER OF SECTION OR DETAIL / DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 4
ENGINEERING PROCEDURE SNS–ENG–G001

REV	DESCRIPTION	DSN	CHK	PE	DATE	PJ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
2	CERTIFIED FOR CONSTRUCTION – 12/20/01	RW	JJB	[signature]	12/01	[signature]	12/01	[signature]	12/26/01	JJB	23236	12/20/01	RW	AW	BWJ	PD	BWJ	BWJ	--	BWJ	--	ED
1	CERTIFIED FOR CONSTRUCTION – MAY 15, 2001	WLS	RW	CLG	9/6/01	JS	8/21/01	JRL	9/25/01	JJB	23236	5/15/01	SC	AW	WRS	RL	WRS	BWJ	--	WRS	--	WAS
0	CERTIFIED FOR CONSTRUCTION – 10/25/00	WLS	SC							JJB	23236	5/15/01										

REVISION OR ISSUE PURPOSE — REVISION APPROVALS — SQUAD CHECK

RPE: JOHN BUSCH, REGISTERED ENGINEER, AGRICULTURE, COMMERCE, NO. 23236, STATE OF TENNESSEE
REV. 2 DATE 12/20/01

DSN	W. SONNA	5/15/01
DRW	T. DEADY	5/15/01
CHK	R. WALKINGTON	5/15/01
DEPT		
PE	C.L. GARREN	9/6/01
PJ	J. STELLERN	8/21/01
REQ		
UTB	J.R. LAWSON	9/25/01

DRAWING APPROVALS

108031400-S8E-8600-A061

Knight/Jacobs Joint Venture, 701 Scarboro Road, MS 8253, Oak Ridge, TN 37830, 865-241-9433, fax 865-241-3400

KNIGHT — Knight Advanced Technology, 549 West Randolph Street, Chicago, IL 60661

UT-BATTELLE — Oak Ridge National Laboratory, managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725, UT-BATTELLE, LLC, © Oak Ridge, Tennessee

PROJECT NAME: SPALLATION NEUTRON SOURCE

CENTRAL LAB AND OFFICE BUILDING
STRUCTURAL NOTES
ABBREVIATIONS & SYMBOLS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	S	X	X	8	8600		1	1	G	U
51	52		53		WBS					REV
NC	NA				1.8.3.14	S0.00.01				2