

STRUCTURAL GENERAL NOTES (CONTINUED)

DIVISION 5 - METALS

- 5.1 STRUCTURAL STEEL
A. GENERAL
1. MATERIALS SHALL CONFORM TO THE FOLLOWING UNLESS NOTED OTHERWISE.
a. W & WT SHAPES: ASTM A992 GRADE 50
b. PLATES, CHANNELS, ANGLES: ASTM A36
c. PIPES: ASTM A53, TYPE E OR S, GRADE B
d. STEEL TUBES: ASTM A500, GRADE B, Fy=48KSI
e. BOLTS: ASTM F1554 GRADE A325, 3/4" DIA (MIN.)
f. ANCHOR RODS: ASTM F1554 GRADE 36
g. THREADED ROD: ASTM A36
h. HEADED SHEAR STUDS: ASTM A 108, GRADES 1015 THROUGH 1020, Fu=65KSI, AWS D1.1, TYPE B
i. STAINLESS STEEL: TYPE 304, 316 OR D319 NON-MAGNETIC, CHROMIUM-NICKEL, LOW-CARBON AUSTENITIC ALLOYS.
j. ELECTRODES: E70XX FOR A36 STEEL AND SMAW PROCESS OR ITS EQUIVALENT, MATCHING WELD METAL FOR OTHER STEEL GRADES AND/OR PROCESSES.
2. ALL STEEL MEMBERS SUPPORTING WORK BY OTHER TRADES (INCLUDING, BUT NOT LIMITED TO, LINTELS, WALL SUPPORTS, CURB ANGLES, MULLIONS, AND SIMILAR SUPPORTING MEMBERS) SHALL BE ADJUSTABLE ITEMS. THESE MEMBERS SHALL BE DETAILED AND FABRICATED TO PROVIDE ADJUSTABLE CONNECTIONS TO THE SUPPORTING STRUCTURAL STEEL FRAME. THE STEEL MEMBERS' TOTAL ADJUSTABILITY SHALL BE AS REQUIRED TO PROVIDE PROPER ALIGNMENT AND TOLERANCES AS SPECIFIED IN THE SPECIFICATIONS OF OTHER TRADES AND SHALL INCLUDE TOLERANCES OF THE STRUCTURAL STEEL. CONTRACTOR SHALL COORDINATE REQUIRED ADJUSTABILITY AND MEANS OF PROVIDING ADJUSTABILITY WITH FABRICATOR AND OTHER TRADES.
B. BOLTS CONNECTIONS AND SPLICES
1. DETAIL STEEL BEAM CONNECTIONS AS SIMPLE SPAN BEAMS, UNLESS NOTED OTHERWISE.
2. ALL BEAM CONNECTIONS SHALL BE DESIGNED AND DETAILED FOR FACTORED LOAD REACTIONS IN KIPS (k) INDICATED ON PLANS WITH THE MINIMUM NUMBER OF BOLTS LISTED BELOW. FOR REACTIONS NOT INDICATED ON THE PLANS, PROVIDE A SHEAR CONNECTION WITH THE MINIMUM CAPACITY AND MINIMUM NUMBER OF BOLTS LISTED BELOW. THE MINIMUM NUMBER OF BOLTS LISTED BELOW FOR THE CORRESPONDING BEAM SIZES SHALL BE APPLICABLE TO ALL FRAMING CONDITIONS UNLESS OFFSET ELEVATION REQUIREMENTS NECESSITATE MODIFIED CONNECTION DETAILS.
C. WELDS
1. ALL WELDING SHALL BE IN ACCORDANCE WITH LATEST AWS AND AISC SPECIFICATIONS.
2. ALL WELDS SHALL BE MADE BY WELDERS CERTIFIED ACCORDING TO AWS PROCEDURES.
D. ERECTION
1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH LATEST AISC SPECIFICATIONS.
E. DESIGN
1. ALL STEEL BEAMS AND LINTELS BEARING ON MASONRY SHALL HAVE 8" MINIMUM BEARING UNLESS NOTED OTHERWISE.
2. PROVIDE BRACING MEMBERS WITH A MINIMUM CONNECTION CAPACITY OF 10 KIPS OR AS NOTED ON DRAWINGS. PROVIDE CALCULATIONS.
F. STEEL LINTELS
1. LOOSE LINTELS FOR MASONRY AT ALL OPENINGS SHALL BE THE FOLLOWING UNLESS NOTED OTHERWISE, ONE ANGLE PER 4" WYTHE OF MASONRY WITH 4" MINIMUM BEARING EACH END.
L3-1/2 X 3-1/2 X 5/16 FOR SPANS LESS THAN 5'-0"
L5 X 3-1/2 X 5/16 LLV FOR SPANS BETWEEN 5'-0" & 7'-11"
L6 X 3-1/2 X 5/16 LLV FOR SPANS BETWEEN 8'-0" & 9'-11"
L7 X 4 X 3/8 LLV FOR SPANS BETWEEN 10'-0" & 12'-11"
FOR 6" MASONRY WYTHES, USE L5X5X5/16" FOR EACH WYTHE, UP TO 5'-0" OPENING SIZES, AND L5X5X3/8 UP TO 8'-0" OPENING SIZES.
2. ALL DOUBLE ANGLE LINTELS BACK TO BACK SHALL BE BOLTED AT 32" O.C. MAXIMUM SPACING, WITH 5/8" DIAMETER A307 BOLTS, A MINIMUM OF TWO BOLTS PER SPAN. AT WIDE FLANGE BEAM SECTIONS WITH CONTINUOUS PLATES (TYPICALLY 5/16"), THE PLATE WIDTH SHALL BE 1" LESS THAN THE NOMINAL MASONRY WALL WIDTH, WITH 8" MINIMUM BEARING. WHERE LESS THAN 1'-0" OF MASONRY EXISTS AT THE END OF THE BEAM ADJACENT TO A COLUMN, WALL, OR OTHER VERTICAL MEMBER, EXTEND THE BEAM AND PROVIDE A CONNECTION TO THE COLUMN OR WALL. AT VENEER CAVITY WALLS, THE EXTERIOR ANGLE SHALL HAVE A HORIZONTAL LEG WIDTH (5" TYPICAL) SIZED TO EXTEND FROM THE REAR OF THE CAVITY TO WITHIN 3/8" (+/-) OF THE EXTERIOR FACE OF THE VENEER.
3. SEE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR OPENING SIZES AND LOCATIONS.
4. ALL EXTERIOR STEEL SHALL BE HOT-DIPPED GALVANIZED ACCORDING TO ASTM A123. TOUCH-UP DAMAGED AREAS WITH AN INORGANIC ZINC-RICH PRIMER, PROVIDING A MINIMUM DRY FILM THICKNESS OF 4.5 MILS. ZINC-RICH PRIMER SHALL MEET FEDERAL SPECIFICATION TT-P-641G, TYPE III, USING A PHENOLIC RESIN VEHICLE.

- G. EQUIPMENT SUPPORT FRAMING
1. PROVIDE ADDITIONAL FRAMING NOT SHOWN ON THE DRAWINGS AS REQUIRED FOR EQUIPMENT SUPPORT.
2. COORDINATE ALL FRAMING DIMENSIONS AT EQUIPMENT FOR ACTUAL EQUIPMENT PROVIDED.
3. WHENEVER POSSIBLE, HANGERS FOR CEILING, DUCTWORK, CABLE TRAYS, LIGHTS, PLUMBING/SPRINKLER PIPES OR ANY OTHER DISCIPLINE ITEM NOT LISTED SHALL BE HUNG DIRECTLY FROM THE STEEL FLOOR BEAMS. WHEN HANGERS ARE NOT ABLE TO BE HUNG DIRECTLY FROM THE STEEL FLOOR BEAMS, THE HANGERS MAY BE ATTACHED TO THE CONCRETE FLOOR WITH EXPANSION OR EPOXY ANCHORS PROVIDED THE FOLLOWING CRITERIA ARE MET:
a. A SINGLE HANGER LOAD SHALL NOT EXCEED 500 LBS (UNFACTORED SERVICE LOAD). A HANGER WITH A 500 LBS LOAD SHALL BE SPACED 5'-9" AWAY FROM AN ADJACENT HANGER AND ONLY ONE HANGER PER DECK SPAN BETWEEN BEAMS.
b. TOTAL HANGER LOADS SHALL NOT EXCEED 15 PSF OVER ANY AREA.
c. ATTACH HANGERS TO THE THICKEST PORTION OF THE SLAB, WHERE THE FLUTES ARE AT THE BOTTOM OF THE OVERALL SLAB THICKNESS.
4. UNDER NO CIRCUMSTANCES MAY HANGERS FOR DUCTWORK, CABLE TRAYS, PLUMBING/SPRINKLER PIPES OR ANY OTHER DISCIPLINE ITEM NOT LISTED (EXCEPT AS NOTED IN ITEM NUMBER 5 BELOW) BE ATTACHED TO ROOF DECKS. HANGERS SHALL BE ATTACHED DIRECTLY TO THE STEEL ROOF BEAMS/JOISTS OR MISCELLANEOUS FRAMING ATTACHED TO THE ROOF BEAMS/JOISTS SHALL BE PROVIDED.
5. WHENEVER POSSIBLE, HANGERS FOR CEILING & LIGHTS SHALL BE HUNG DIRECTLY FROM THE STEEL BEAMS/JOISTS. WHEN HANGERS ARE NOT ABLE TO BE HUNG DIRECTLY FROM THE STEEL BEAMS/JOISTS, THE HANGERS MAY BE ATTACHED TO NON-ACOUSTICAL ROOF DECK AS LONG AS THE LOAD DOES NOT EXCEED THE SMALLER OF 5 PSF OR 50 LBS. FOR LOCATIONS THAT EXCEED THIS LOAD AND FOR ACOUSTICAL ROOF DECK LOCATIONS, PROVIDE MISCELLANEOUS FRAMING ATTACHED TO THE ROOF BEAMS/JOISTS.
5.2 STEEL JOISTS
A. GENERAL
1. ALL STEEL JOISTS SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH SJI K-10 AND SJI LH/DLH-10.
2. REFER TO SJI SPECIFICATIONS FOR ERECTION PROCEDURES CONCERNING STABILITY, HANDLING, END CONNECTIONS, AND TIMING OF LOAD PLACEMENT.
3. STEEL JOISTS WITHOUT SPECIFIED CHORD SIZE SHALL BE DESIGNED BY CONTRACTOR FOR LOADS AS SHOWN ON DRAWINGS.
4. ALIGN ALL STEEL JOIST PANEL POINTS TO PERMIT PASSAGE OF DUCT WORK.
5. STEEL JOISTS SHALL HAVE RIGID BRIDGING (CROSS BRACING) SIZED AND SPACED IN ACCORDANCE WITH LATEST SJI SPECIFICATIONS, WELDED TO PARALLEL BEAMS AND STRUTS AND ANCHORED TO WALLS. HORIZONTAL BRIDGING PROVIDING EQUIVALENT STRENGTH SHALL BE USED BETWEEN JOISTS WHERE MECHANICAL DUCTWORK CONFLICTS WITH CROSS-BRACING, PROVIDED EACH JOIST HAS CROSS BRACING ON ONE SIDE.
6. DESIGN STEEL JOISTS AND BRIDGING FOR A NET (ASD) WIND UPLIFT EQUAL TO THE FOLLOWING:
a. ZONE 1 (AT TYPICAL ROOF AREAS): 20 PSF
b. ZONE 2 (AT ROOF EDGES, HIP, VALLEYS, & RIDGE WITHIN DIMENSION 'a' FROM EDGE): 24 PSF
c. ZONE 3 (AT ROOF EDGE/RIDGE CORNERS WITHIN DIMENSION 'a' FROM CORNER): 41 PSF
d. ZONE 2 (AT ROOF OVERHANGS): 38 PSF
e. ZONE 3 (AT ROOF CORNER OVERHANGS): 50 PSF
f. DIMENSION 'a': 13'-0"
7. STEEL JOISTS WITH EXTENDED ENDS SHALL BE DESIGNED BY CONTRACTOR FOR LOADS AS SHOWN ON DRAWINGS. IF LOADS ARE NOT INDICATED, THE STEEL JOIST EXTENDED ENDS SHALL BE DESIGNED TO SUPPORT THE UNIFORM LOAD INDICATED IN THE JOIST LOAD TABLES FOR THE SPAN OF THE JOIST BETWEEN SUPPORTING MEMBERS (OPPOSITE EXTENDED ENDS).
8. STEEL JOISTS DESIGNATED SP SHALL BE DESIGNED BY SUPPLIER FOR LOADS, SPECIAL SHAPES, AND/OR SPECIAL SEAT CONDITIONS INDICATED.
9. FIELD JOIST LOCATED AT COLUMNS FOR STABILITY DURING CONSTRUCTION. SPLICES IN LONG SPAN JOISTS MAY BE BOLTED. INCREASE SIZE OF CONNECTED PARTS TO ACCOUNT FOR LOSS OF AREA, IF REQUIRED.
10. SPLICE PLATES SHALL HAVE THE SAME NET AREA AND CENTROID AS THE CONNECTED PARTS.
11. FOR K, LH, DLH, & SLH SERIES JOISTS, THE SHEAR CAPACITY SHALL BE DESIGNED BASED ON THE SHEAR DIAGRAMS RESULTING FROM THE ALLOWABLE UNIFORM LOAD CAPACITY OF THE JOIST WITH A MINIMUM DESIGN SHEAR CAPACITY EQUAL TO OR GREATER THAN 25% OF THE MAXIMUM END DESIGN SHEAR CAPACITY, TYPICAL UNO.
12. JOISTS SHALL BE DESIGNED FOR A MINIMUM 5% STRESS REVERSAL, TYPICAL UNLESS NOTED OTHERWISE.
B. STEEL K JOISTS
1. STEEL K JOISTS SHALL BE WELDED WITH TWO 1" LONG 1/8" FILLET WELDS TO SUPPORTING BEAMS, WITH A MINIMUM OF 2'-12" OF BEARING, UNLESS SPECIAL BEARING ENDS ARE PROVIDED, WITH A POSITIVE WELDED OR BOLTED CONNECTION.
2. STEEL K JOISTS SHALL HAVE A MINIMUM BEARING OF 4" ON MASONRY OR CONCRETE WALLS. EACH JOIST UNLESS OTHERWISE SHOWN ON PLANS SHALL BE FIELD WELDED TO AN EMBEDDED PLATE WITH TWO 1" LONG 1/8" FILLET WELDS.
3. REFER TO SJI SPECIFICATIONS FOR ERECTION STABILITY AND BOLTED DIAGONAL BRIDGING REQUIREMENTS AT THE ROW OF BRIDGING NEAREST MIDSPAN, FOR MAXIMUM SPANS OF CERTAIN JOISTS.
C. STEEL LH AND DLH JOISTS
1. ALL STEEL LH & DLH JOISTS SHALL BE WELDED WITH TWO 2" LONG 1/4" FILLET WELDS TO SUPPORTING BEAMS, WITH A MINIMUM OF 4" OF BEARING, UNLESS SPECIAL BEARING ENDS ARE PROVIDED, WITH A POSITIVE WELDED OR BOLTED CONNECTION.
2. STEEL LH & DLH JOISTS SHALL HAVE A MINIMUM BEARING OF 6" ON MASONRY OR CONCRETE WALLS. EACH JOIST UNLESS OTHERWISE SHOWN ON PLANS SHALL BE FIELD WELDED TO AN EMBEDDED PLATE WITH TWO 2" LONG 1/4" FILLET WELDS.
3. JOISTS DETAILED WITH SLOTTED HOLES AT BEARING ENDS SHALL BE WELDED AFTER ALL DEAD LOAD HAS BEEN APPLIED.
4. REFER TO SJI SPECIFICATIONS FOR ERECTION STABILITY AND BOLTED DIAGONAL BRIDGING REQUIREMENTS AT THE ROW OF BRIDGING NEAREST MIDSPAN, OR FOR TWO ROWS OF BRIDGING NEAR THIRD POINTS, OR FOR ALL BRIDGING, FOR MAXIMUM SPANS OF CERTAIN JOISTS.

- 5.3 STEEL DECK
A. GENERAL
1. ALL STEEL ROOF DECK SHALL BE WELDED TO SUPPORTING BEAMS AND JOISTS AND ERECTED IN ACCORDANCE WITH MANUFACTURER'S LATEST RECOMMENDATIONS. DESIGN, MANUFACTURE AND ERECTION SHALL BE COMPLIANT WITH ANSIR/D1.0-10, SDI-C-2011, AND SDI-QA/C-2011.
2. DECK SHALL BE CONTINUOUS OVER 3 SPANS.
3. AT SUPPORTS PARALLEL TO THE DECK SPAN, RAISE STEEL SUPPORTS OR PROVIDE SHIMS AT WELD POINTS IF THE DECK VALLEY DOES NOT ENGAGE THE SUPPORT.
B. ROOF DECK
1. 1-1/2" DEEP (WIDE RIB) ROOF DECK, AS INDICATED ON PLAN, SHALL HAVE THE FOLLOWING PROPERTIES:
a. 18 GAUGE, l=0.289 IN^4/FT, Sx=0.318 IN^3/FT, Ix=0.295 IN^4/FT, Iy=0.327 IN^3/FT, AND Fy=33 KSI.
2. 3" ROOF DECK, AS INDICATED ON PLAN, SHALL BE 18 GAUGE, TYPE N, Ix=1.238 IN^4/FT, Iy=1.43 IN^4/FT, Sx=0.688 IN^3/FT, Sy=0.749 IN^3/FT, AND Fy=33 KSI.
3. ROOF DECK SHALL HAVE BOTH SIDES OF DECK GALVANIZED AND BOTTOM SIDE OF DECK SHOP PRIMED.
4. 1 1/2" DEEP (WIDE RIB) ROOF DECK SHALL BE WELDED TO SUPPORTS WITH 5/8" DIAMETER PUDDLE WELDS AND SHALL BE CONNECTED AT SIDE LAPS WITH NO. 12 SELF-DRILLING SCREW SIDELAP FASTENERS AS FOLLOWS, UNLESS NOTED OTHERWISE:
a. WELD PATTERN PERPENDICULAR TO FLUTES: 3/65
b. SIDELAP FASTENERS: 10" ON CENTER
c. WELD SPACING PARALLEL TO FLUTES: AT 10" ON CENTER
5. 3" DEEP ROOF DECK SHALL BE WELDED TO SUPPORTS WITH 3/4" DIAMETER PUDDLE WELDS AND SHALL BE CONNECTED AT SIDE LAPS WITH NO. 14 SELF-DRILLING SCREW SIDELAP FASTENERS AS FOLLOWS, UNLESS NOTED OTHERWISE:
a. WELD PATTERN PERPENDICULAR TO FLUTES: 2/44
b. SIDELAP FASTENERS: 10" ON CENTER
c. WELD SPACING PARALLEL TO FLUTES: AT 10" ON CENTER
C. STEEL FLOOR DECK
1. ALL STEEL FLOOR DECK SHALL BE WELDED TO SUPPORTS AND ERECTED IN ACCORDANCE WITH MANUFACTURER'S LATEST RECOMMENDATIONS.
2. PROVIDE POUR STOPS/CLOSURE STRIPS/ACCESSORIES AS REQUIRED FOR CONCRETE TOPPING PLACEMENT, SEE SPECS.
3. 2" COMPOSITE STEEL DECK, AS INDICATED ON PLAN, SHALL BE 18 GAUGE, l=0.559 IN^4/FT, Ix=0.558 IN^4/FT, Sx=0.495 IN^3/FT, Sy=0.504 IN^3/FT, AND Fy=50 KSI.
4. COMPOSITE STEEL DECK SHALL BE WELDED TO SUPPORTS WITH 5/8" DIAMETER PUDDLE WELDS AND SHALL BE CONNECTED AT SIDE LAPS WITH NO. 12 SCREW SIDELAP FASTENERS AS FOLLOWS, UNLESS NOTED OTHERWISE:
a. WELD PATTERN PERPENDICULAR TO FLUTES: 3/64
b. SIDELAP FASTENERS: AT 24" ON CENTER
c. WELD SPACING PARALLEL TO FLUTES: AT 12" ON CENTER
5.4 COLD-FORMED METAL FRAMING
A. THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF ALL COLD-FORMED METAL FRAMING MEMBERS & CONNECTIONS. THE COLD-FORMED METAL FRAMING SHALL BE DESIGNED BY A LICENSED STRUCTURAL/PROFESSIONAL ENGINEER, SIGNED AND SEALED STRUCTURAL CALCULATIONS SHALL BE SUBMITTED FOR REVIEW BY THE CONTRACTING OFFICER. SHOP DRAWINGS SHALL BE SUBMITTED INDICATING MEMBER GAUGES, SHAPES, SIZES, SPACINGS, LOCATIONS, AND CONNECTIONS. COLD-FORMED METAL FRAMING SIZES SHOWN ON THE DRAWINGS ARE MINIMUM SIZES AND SHALL BE VERIFIED FOR THE CODE DESIGN LOADS.
B. ALL COLD-FORMED METAL FRAMING SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH AISI S100-12, S200-12, AND S211-07/S1-12 (2012).
C. COMPLETE, UNIFORM, AND LEVEL BEARING SUPPORT SHALL BE PROVIDED FOR THE BOTTOM TRACK OF STUD WALLS, OR FULL SIZE SHIMS SHALL BE INSTALLED TO PROVIDE SUCH BEARING.
D. STUDS SHALL BE INSTALLED WITH THEIR BEARING ENDS POSITIONED FLUSH AGAINST THE INSIDE TRACK WEB.
E. FULL-HEIGHT DOUBLE STUDS SHALL BE PROVIDED AT THE ENDS OF PARTITIONS, AT ALL WALL OPENINGS, AND AT OTHER LOCATIONS SHOWN ON THE PLANS. PROVIDE A MINIMUM OF ONE JACK STUD AT ALL OPENINGS IN ADDITION TO FULL HEIGHT STUDS. PROVIDE STUD WALL AND JOIST BRIDGING ACCORDING TO MANUFACTURER'S LATEST RECOMMENDATIONS.
F. ANCHOR STUD TRACKS TO CONCRETE WITH LOW-VELOCITY POWER-DRIVEN FASTENERS WITH A MINIMUM SHANK DIAMETER OF 0.177", AND A MINIMUM PENETRATION OF 1-7/16". LOCATE ANCHORS AT 3" FROM THE ENDS OF PARTITIONS, AND AT 16" O.C. (MAXIMUM) THROUGHOUT.
H. DRILL HOLES IN WEBS OF TRACKS WHERE REQUIRED TO ATTACH TRACK TO CONCRETE OR MASONRY WALLS AS SHOWN ON PLANS. HOLES BURNED IN WEBS WILL NOT BE ACCEPTABLE. USE WASHERS UNDER ALL NUTS AND BOLT HEADS.
I. CONTACT CONTRACTING OFFICER BEFORE CUTTING TRACKS OF JOIST FRAMING FOR DUCTWORK. DO NOT CUT JOISTS OR STUDS.
J. SPLICES IN STUDS AND JOISTS SHALL NOT BE PERMITTED.
K. PROVIDE METAL STUD SLIDE/DEFLECTION CLIPS AT STUD CONNECTIONS TO STRUCTURAL STEEL FOR STUDS BEARING ON FOUNDATION STEM WALL TYPICAL.
L. THE DRAWINGS HAVE UTILIZED COLD-FORMED METAL CONNECTION MATERIAL MANUFACTURED BY "THE STEEL NETWORK INC." (www.steelnetwork.com) PHONE: 702-643-4330. PROVIDE COLD-FORMED METAL CONNECTORS WITH EQUIVALENT DESIGN VALUES TO THE PUBLISHED DESIGN VALUES BY THE STEEL NETWORK INC FOR THE ANCHORS/CONNECTORS NOTED ON THE DRAWINGS.
M. VERTICAL STUDS SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
1. 3625/162-54: 3 5/8" STUDS: 16 GAUGE: lx=0.87 IN^4, Sx=0.44 IN^3, ASTM A653: 50 KSI
2. 6005/162-54: 6" STUDS: 16 GAUGE: lx=2.86 IN^4, Sx=0.92 IN^3, ASTM A653: 50 KSI
3. 8005/162-54: 8" STUDS: 16 GAUGE: lx=5.60 IN^4, Sx=1.23 IN^3, ASTM A653: 50 KSI
5.5 GRATING
A. GRATING SHALL HAVE BANDED EDGES.
B. STEEL GRATING SHALL BE ASTM A 1011 WITH SIZE AS NOTED ON DRAWINGS (UNO).
C. PROVIDE SADDLE CLIPS AND MACHINE BOLTS @ 24" O.C. MINIMUM (MINIMUM 4 PER SECTION OF GRATING - 2 PER BEARING SIDE).

- 5.6 EMBEDDED ITEMS AND ANCHORS FOR CONCRETE AND MASONRY
A. CONCRETE APPLICATION:
1. ALL ANCHORS NOTED AS EPOXY & POST-INSTALLED REINFORCING BAR DOWELS ATTACHED TO EXISTING CONSTRUCTION SHALL BE EPOXY GROUTED INTO EXISTING CONCRETE UNO.
a. BASIS OF DESIGN EPOXY & ANCHOR: HILTI HIT-HY 200 SAFE SET SYSTEM WITH HILTI HOLLOW DRILL BIT. ANCHOR BOLT INSERTS TO BE HILTI HAS-E STANDARD RODS. FOR CONDITIONS WHERE THE ROD IS LARGER THAN 1 INCH DIAMETER, TRADITIONAL HOLE-CLEANING (AS SPECIFIED BY THE ANCHOR SYSTEM MANUFACTURER) SHALL BE REQUIRED.
2. ALL ANCHORS NOTED AS EXPANSION (EXP) ANCHORS SHALL MEET OR EXCEED THE CRITERIA INDICATED.
a. BASIS OF DESIGN EXPANSION ANCHORS: HILTI KWIK BOLT KB-TZ ANCHORS. HOLE-CLEANING SHALL BE REQUIRED AND AS SPECIFIED BY THE ANCHOR MANUFACTURER.
3. INSERTS INTO CONCRETE SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE (ALL EMBEDMENT DEPTHS ARE MINIMUM VALUES):
a. 3/8" DIAMETER: a) EXPANSION ANCHOR: 2 3/8" EMBEDMENT; b) ADHESIVE ANCHOR: 3 3/8" EMBEDMENT;
b. 1/2" DIAMETER: a) EXPANSION ANCHOR: 3 5/8" EMBEDMENT; b) ADHESIVE ANCHOR: 4 1/2" EMBEDMENT;
c. 5/8" DIAMETER: a) EXPANSION ANCHOR: 4 1/2" EMBEDMENT; b) ADHESIVE ANCHOR: 5 5/8" EMBEDMENT;
d. 3/4" DIAMETER: a) EXPANSION ANCHOR: 5 5/8" EMBEDMENT; b) ADHESIVE ANCHOR: 6 3/4" EMBEDMENT;
e. 7/8" DIAMETER: a) EXPANSION ANCHOR: NOT APPLICABLE; b) ADHESIVE ANCHOR: 7 7/8" EMBEDMENT
B. MASONRY APPLICATION:
1. ALL ANCHORS NOTED AS EPOXY & POST-INSTALLED REINFORCING BAR DOWELS ATTACHED TO EXISTING CONSTRUCTION SHALL BE EPOXY GROUTED INTO EXISTING CMU UNO.
a. BASIS OF DESIGN EPOXY & ANCHOR: HILTI HIT-HY 70. ANCHOR BOLT INSERTS SHALL BE ASTM A307 OR A36 RODS.
2. ALL ANCHORS NOTED AS EXPANSION (EXP) ANCHORS SHALL MEET OR EXCEED THE CRITERIA INDICATED.
a. BASIS OF DESIGN EXPANSION ANCHOR: HILTI KWIK BOLT 3 ANCHORS. HOLE-CLEANING SHALL BE REQUIRED AND AS SPECIFIED BY THE ANCHOR MANUFACTURER.
3. INSERTS INTO CMU SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE (ALL EMBEDMENT DEPTHS ARE MINIMUM VALUES):
a. 3/8" DIAMETER: a) EXPANSION ANCHOR: 2 1/2" EMBEDMENT; b) ADHESIVE ANCHOR: 3 3/8" EMBEDMENT;
b. 1/2" DIAMETER: a) EXPANSION ANCHOR: 3 1/2" EMBEDMENT; b) ADHESIVE ANCHOR: 4 1/2" EMBEDMENT;
c. 5/8" DIAMETER: a) EXPANSION ANCHOR: 4" EMBEDMENT; b) ADHESIVE ANCHOR: 5 5/8" EMBEDMENT;
d. 3/4" DIAMETER: a) EXPANSION ANCHOR: 4 3/4" EMBEDMENT; b) ADHESIVE ANCHOR: 6 3/4" EMBEDMENT
C. EPOXY GROUT & ANCHORS AND EXPANSION ANCHORS SHALL HAVE PUBLISHED DESIGN VALUES THE MEET OR EXCEED THE BASIS OF DESIGN PUBLISHED DESIGN VALUES. SUBMIT SIGNED AND SEALED CALCULATIONS ILLUSTRATING THAT THE PROPOSED PRODUCTS ARE CAPABLE OF ACHIEVING OR EXCEEDING THE PERFORMANCE OF THE BASIS OF DESIGN PRODUCT. THE PROPOSED PRODUCT SHALL HAVE AN ICC ESR REPORT ILLUSTRATING ITS COMPLIANCE WITH THE SPECIFIED BUILDING CODE, SEISMIC DESIGN CATEGORY, CRACKED CONCRETE CONDITIONS, LOAD RESISTANCE, INSTALLATION CATEGORY, AND COMPREHENSIVE INSTALLATION INSTRUCTIONS. INSTALL ANCHORS PER THE MANUFACTURER'S INSTRUCTIONS. PROVIDE INSTALLATION TRAINING FOR ALL PERSONNEL INSTALLING ANCHORS.
D. FOR EACH ANCHOR TYPE, REFER TO THE ICC ESR REPORT FOR CHARACTERISTIC BOND STRESSES, MINIMUM AGE OF CONCRETE, CONCRETE TEMPERATURE RANGE, MOISTURE CONDITION OF CONCRETE AT TIME OF INSTALLATION, TYPE OF CONCRETE AGGREGATE, AND REQUIREMENTS FOR HOLE DRILLING & PREPARATION.
E. INSTALL ANCHORS PER THE MANUFACTURER'S INSTRUCTIONS. PROVIDE INSTALLATION TRAINING FOR ALL PERSONNEL INSTALLING ANCHORS.
F. WHEN INSTALLING ANCHOR BOLTS, INSERTS, OR DOWELS INTO EXISTING CONCRETE, USE A MECHANICAL REBAR LOCATING DEVICE TO LOCATE EXISTING REINFORCING AND DRILL HOLE TO MISS REINFORCEMENT.

STRUCTURAL ABBREVIATIONS
ADDL ADDITIONAL
AESS ARCHITECTURALLY EXPOSED STRUCTURAL STEEL
ALT ALTERNATE
BLDG BUILDING
BM BEAM
BOD BOTTOM OF DECK
BP BASE PLATE
BOT BOTTOM
BRG BEARING
B/STL BOTTOM OF STEEL
c CAMBER (UPWARD)
CJ CONTROL JOINT
CL CENTER LINE
CLR CLEAR COVER
CSJ CONSTRUCTION JOINT
CONT CONTINUOUS
CONST CONSTRUCTION
CTRD CENTERED
DIM DIMENSION
DWG DRAWING
DWL DOWEL
EA EACH
EE EACH END
EF EACH FACE
EQ EQUAL
EL ELEVATION
ELEV ELEVATION
EQUIP EQUIPMENT
EW EACH WAY
EXP EXPANSION
FD FLOOR DRAIN
FND FOUNDATION
FF FAR FACE
FG FINISH GRADE
FTG FOOTING
FV FIELD VERIFY
GALV GALVANIZED
GC GENERAL CONTRACTOR
GRGT GRATING
HORZ HORIZONTAL
LG LONG
LLH LONG LEG HORIZONTAL
LLV LONG LEG VERTICAL
MANF MANUFACTURER
MAX MAXIMUM
MECH MECHANICAL
MEZZ MEZZANINE
MIN MINIMUM
MISC MISCELLANEOUS
MTL METAL
NA NOT APPLICABLE
NF NEAR FACE
NTS NOT TO SCALE
OC ON CENTER
PC PIECE
OPNG OPENING
PAF POWER ACTUATED FASTENER
PLATE PLATE
PROJ PROJECTION
PSF POUNDS PER SQUARE FOOT
REINF REINFORCEMENT
REQ'D REQUIRED
RTU ROOF TOP UNIT
SEJ SEALED EDGE ISOLATION JOINT
SEJ SEALED EDGE JOINT
SIM SIMILAR
SOG SLAB ON GRADE
SPA SPACE
T&B TOP AND BOTTOM
THK THICK
TP TOP OF PILASTER
T/SLAB TOP OF SLAB
T/WALL TOP OF WALL
TF TOP OF FOOTING
T/STL TOP OF STEEL
TYP TYPICAL
UNO UNLESS NOTED OTHERWISE
VERT VERTICAL
W/ WITH
WP WORKING POINT
WS WATERSTOP
WWR WELDED WIRE REINFORCEMENT

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Table with 3 columns: REV, DESCRIPTION, DATE

AVCRAD PHASE 3A ADDITION
1107th THEATER AVIATION SUSTAINMENT MAINTENANCE GROUP
MISSOURI ARMY NATIONAL GUARD
GREENE COUNTY
SPRINGFIELD, MISSOURI
CONTRACT NO. T1808-01
NATIONAL GUARD BUREAU
NGB PROJECT NO. 290109

Scales:
Project No.: T1808-01
Drawing Title: STRUCTURAL GENERAL NOTES AND ABBREVIATIONS
Date: 29 JUNE 2018
Designed: TLB
Drawn: BMF
Checked: BJH
Drawing No.: S-002
60 of 322

JACOBS PROJECT NO. F3W91001
EIM 360/105/F3W91000-TASMG-ARCH/MOD/RWG
TASMG-STRUCT-F-V17.dwg
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