

COMPOSITE STEEL FLOOR FRAMING

1. COMPOSITE STEEL FLOOR DECK SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE CURRENT STEEL DECK INSTITUTE SPECIFICATIONS.
2. COMPOSITE STEEL FLOOR DECK SHALL BE OF THE DEPTH AND GAUGE INDICATED ON PLAN AND COMPRISED OF THE FOLLOWING MINIMUM PROPERTIES:

1.5" (20 GA) 36" WIDE COMPOSITE STEEL DECK

0.197 IN"/FT

0.217 IN"/FT

0.224 IN"/FT

0.229 IN"/FT
3. COMPOSITE STEEL FLOOR DECK SHALL BE ASTM A653 STEEL GRADE 50 MINIMUM.
4. STEEL FLOOR DECK SHALL BE GALVANIZED (G60) CONFORMING TO ASTM A924.
5. EACH STEEL FLOOR DECKING PANEL SHALL BE ATTACHED TO SUPPORTING MEMBERS AND ADJACENT PANELS AS INDICATED BELOW:

A. INTERIOR AND END SUPPORTS

5/8" DIA PUDDLE WELDS

4 PER 36" PANEL (36/4 PATTERN)

B. SIDE LAP AND EDGE FASTENERS

1-1/2" SEAM WELDS

24" OC MAX
6. COMPOSITE STEEL FLOOR DECK SHALL BE TOPPED WITH A NORMAL WEIGHT CONCRETE SLAB (DEPTH AS INDICATED ON PLAN) AND REINFORCED AS INDICATED ON PLAN. REFER TO THE CONCRETE MIX STRUCTURAL GENERAL NOTES FOR CONCRETE PROPERTIES
7. INSTALL DECK IN THREE SPAN LENGTHS WITHOUT SHORING. SINGLE OR TWO SPAN DECK LENGTHS REQUIRE SHORING UNLESS A HEAVIER GAUGE DECK IS SUBMITTED WHICH CAN SPAN WITHOUT SHORING.
8. COMPOSITE STEEL BEAMS ARE SHOWN ON THE FLOOR FRAMING PLANS WITH SHEAR STUDS AND BEAM CAMBER INDICATED IF REQUIRED.
9. COMPOSITE STEEL FRAMING ON THIS PROJECT IS DESIGNED AS NON-SHORED CONSTRUCTION. THE COMPOSITE STEEL BEAMS SHALL NOT BE SHORED DURING THE CONCRETE SLAB PLACEMENT.
10. INSTALL DECK ENDS OVER SUPPORTING FRAME WITH A MINIMUM END BEARING LENGTH IN ACCORDANCE WITH THE TYPICAL FLOOR DECK BEARING DETAIL, WITH END JOINTS BUTTED; DO NOT OVERLAP.
11. THE COMPOSITE STEEL DECK SHALL BE ATTACHED TO THE SUPPORTING STEEL AT 12" OC MAX. THE STEEL DECK SHALL BE CONNECTED TO THE SUPPORTING STEEL BEAMS BY WELDING THE SPECIFIED SHEAR/HEADED STUD CONNECTORS THROUGH THE DECK BY THE FULL-FUSION PROCESS, AS FURNISHED BY TRW NELSON STUD WELDING DIVISION OR EQUAL. WHERE THE MINIMUM SHEAR/HEADED STUD CONNECTORS ARE REQUIRED FOR A BEAM, OR WHERE THE SPECIFIED SHEAR/HEADED STUD CONNECTOR SPACING EXCEEDS 12" OC, PROVIDE 3/4" PUDDLE WELDS BETWEEN SHEAR/HEADED STUD CONNECTORS TO MAINTAIN A MAXIMUM DECK CONNECTION SPACING OF 12" OC. WHERE DECK UNITS ABUT SIDE TO SIDE OR END TO END OVER A STEEL BEAM OR ABUT TO A GIRDER FILLER, PROVIDE 3/4" PUDDLE WELDS AT 12" OC ON EACH DECK UNIT.
12. WHERE THE COMPOSITE STEEL DECK IS SUPPORTED BY A STEEL LEDGE ANGLE ATTACHED TO A CONCRETE OR MASONRY WALL, ATTACH DECK TO THE LEDGE ANGLE WITH 3/4" PUDDLE WELDS AT 12" OC.
13. WELD GIRDER FILLERS TO STEEL BEAM WITH 2" LONG FILLET WELDS AT A MAXIMUM SPACING OF 12 INCHES.
14. CONNECT SIDES OF ADJACENT UNITS WITH 1 1/2" LONG WELDS OR MECHANICALLY CLINCH OR BUTTON PUNCH AT 2'-0" OC.
15. THE CONTRACTOR SHALL NOT PLACE EXCESSIVE AMOUNTS OF CONCRETE IN ANY ONE LOCATION ON TOP OF THE METAL DECK OR ANY ONE BEAM DURING THE CONCRETE PLACEMENT OPERATION. THE CONTRACTOR SHALL MONITOR THE DEFLECTION OF THE STEEL BEAMS, THE SLAB THICKNESS AND PLACING OF THE CONCRETE DURING THE PLACEMENT OPERATION TO PREVENT EXCESSIVE LOAD ON ANY BEAM.
16. SHEAR/HEADED STUD CONNECTORS SHALL BE OF THE SIZE AND QUANTITY SHOWN ON THE DRAWINGS.
17. ALL SHEAR/HEADED STUD CONNECTORS SHALL BE APPLIED IN THE FIELD AND PLACED IN THE DECK FLUTES IN CONTACT WITH THE TOP FLANGE OF THE BEAM. INSTALL THE CONNECTORS ALONG THE ENTIRE BEAM LENGTH, EQUALLY SPACED IN A SINGLE ROW WITH A SINGLE CONNECTOR, WHERE POSSIBLE, IN THE DECK FLUTES.
18. MAXIMUM SPACING OF SHEAR/HEADED STUD CONNECTORS SHALL BE 24" ON CENTER.
19. WELDED WIRE MESH SHALL BE SUPPORTED ON CHAIRS WITH A 3/4" COVER FROM THE TOP OF THE SLAB.
20. PROVIDE 14 GAUGE COLD FORMED STEEL POUR STOPS WELDED TO THE STEEL BEAM FLANGE WITH 1" FILLET WELDS AT 12" OC. UNLESS NOTED OTHERWISE IN THE DRAWINGS.
21. DO NOT LOAD COMPOSITE FLOORS UNTIL THE CONCRETE REACHES 75 PERCENT OF ITS SPECIFIED STRENGTH.

EXTERNALLY BONDED FIBER-REINFORCED POLYMER (FRP) STRENGTHENING

1. FURNISH AND INSTALL AN EXTERNALLY BONDED CARBON FIBER-REINFORCED POLYMER (CFRP) STRENGTHENING SYSTEM AT LOCATIONS INDICATED ON THE DRAWINGS.
2. THE FRP SYSTEM, INCLUDING FIBERS, RESIN, PRIMER, PUTTY, SATURANT, PROTECTIVE COATINGS, AND ACCESSORIES, SHALL BE SUPPLIED BY A SINGLE MANUFACTURER AS A COMPLETE, COMPATIBLE SYSTEM.
3. MATERIALS, DESIGN, INSTALLATION, QUALITY CONTROL, INSPECTION, AND ACCEPTANCE SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 440.2R-17, GUIDE FOR THE DESIGN AND CONSTRUCTION OF EXTERNALLY BONDED FRP SYSTEMS FOR STRENGTHENING CONCRETE STRUCTURES, EXCEPT WHERE MODIFIED BY THE CONTRACT DOCUMENTS.
4. THE FRP STRENGTHENING SYSTEM SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROJECT STATE AND EXPERIENCED IN THE DESIGN OF EXTERNALLY BONDED FRP STRENGTHENING SYSTEMS. THE DELEGATED DESIGN ENGINEER SHALL BE RESPONSIBLE FOR THE COMPLETE DESIGN OF THE FRP STRENGTHENING SYSTEM, INCLUDING ALL ANALYSES, CALCULATIONS, DETAILS, AND CONSTRUCTION DOCUMENTS REQUIRED TO SATISFY THE DESIGN INTENT INDICATED ON THE CONTRACT DOCUMENTS.
5. THE DELEGATED DESIGN ENGINEER SHALL EVALUATE THE EXISTING STRUCTURE AND DESIGN THE FRP STRENGTHENING SYSTEM TO ACHIEVE THE REQUIRED STRUCTURAL PERFORMANCE. THE DESIGN SHALL INCLUDE, AS APPLICABLE:

A. EXISTING CONDITION ASSESSMENT AND VERIFICATION OF SUBSTRATE ADHESIBILITY.

B. DETERMINATION OF REQUIRED FRP MATERIAL, FIBER ORIENTATION, NUMBER OF LAYERS, WIDTHS, SPACING, AND LOCATIONS.

C. FLEXURAL, SHEAR, AXIAL, TORSIONAL, CONFINEMENT, AND COMBINED FORCE STRENGTHENING, AS APPLICABLE.

D. EVALUATION OF EXISTING REINFORCING STEEL AND INTERACTION WITH THE FRP STRENGTHENING SYSTEM.

E. BOND, DEVELOPMENT LENGTH, ANCHORAGE, LAP SPLICE, AND TERMINATION DESIGN.

F. VERIFICATION OF ALL GOVERNING LIMIT STATES, INCLUDING CONCRETE CRUSHING, FRP RUPTURE, DEBONDING, PEELING, ANCHOR FAILURE, AND SERVICEABILITY REQUIREMENTS.

G. EVALUATION OF ENVIRONMENTAL REDUCTION FACTORS, CREEP RUPTURE, SUSTAINED LOADING EFFECTS, AND DURABILITY IN ACCORDANCE WITH ACI 440.2R-17.

H. DESIGN OF ALL SUPPLEMENTAL ANCHORAGE, MECHANICAL ANCHORS, AND CONFINEMENT SYSTEMS REQUIRED TO DEVELOP THE DESIGN CAPACITY.

I. COORDINATION WITH EXISTING AND NEW STRUCTURAL ELEMENTS TO MAINTAIN A CONTINUOUS LOAD PATH.

6. THE STRENGTHENING SHALL AFFECTS THE EXISTING SEISMIC FORCE-RESISTING SYSTEM AND IS INTENDED TO IMPROVE SEISMIC PERFORMANCE. THE DELEGATED DESIGN ENGINEER SHALL PERFORM A SEISMIC EVALUATION OF THE EXISTING STRUCTURE IN ACCORDANCE WITH ACI/SEI 41. THE EVALUATION SHALL VERIFY THAT THE STRENGTHENED STRUCTURE SATISFIES THE REQUIRED PERFORMANCE OBJECTIVES AND THAT THE FRP STRENGTHENING DOES NOT ADVERSELY AFFECT MEMBER DUCTILITY, DEFORMATION COMPATIBILITY, FORCE TRANSFER, STIFFNESS DISTRIBUTION, OR OVERALL SEISMIC BEHAVIOR. THE STRENGTHENING DESIGN SHALL BE COMPATIBLE WITH THE SEISMIC REQUIREMENTS OF THE GOVERNING BUILDING CODE AND SHALL INCLUDE ALL ADDITIONAL STRENGTHENING NECESSARY TO PROVIDE A COMPLETE AND FUNCTIONAL LOAD PATH.

7. CONCRETE SURFACES SHALL BE SOUND, CLEAN, DRY, AND PROPERLY PREPARED IN ACCORDANCE WITH THE FRP MANUFACTURER'S WRITTEN RECOMMENDATIONS BEFORE INSTALLATION. UNSOUND CONCRETE SHALL BE REMOVED AND REPAIRED PRIOR TO APPLICATION OF THE FRP SYSTEM.

8. INSTALLATION SHALL BE PERFORMED BY PERSONNEL EXPERIENCED IN FRP STRENGTHENING SYSTEMS AND IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTALLATION PROCEDURES.

9. INSTALLATION SHALL NOT BEGIN UNTIL ALL CONCRETE REPAIRS HAVE BEEN COMPLETED AND ACCEPTED BY THE ENGINEER.

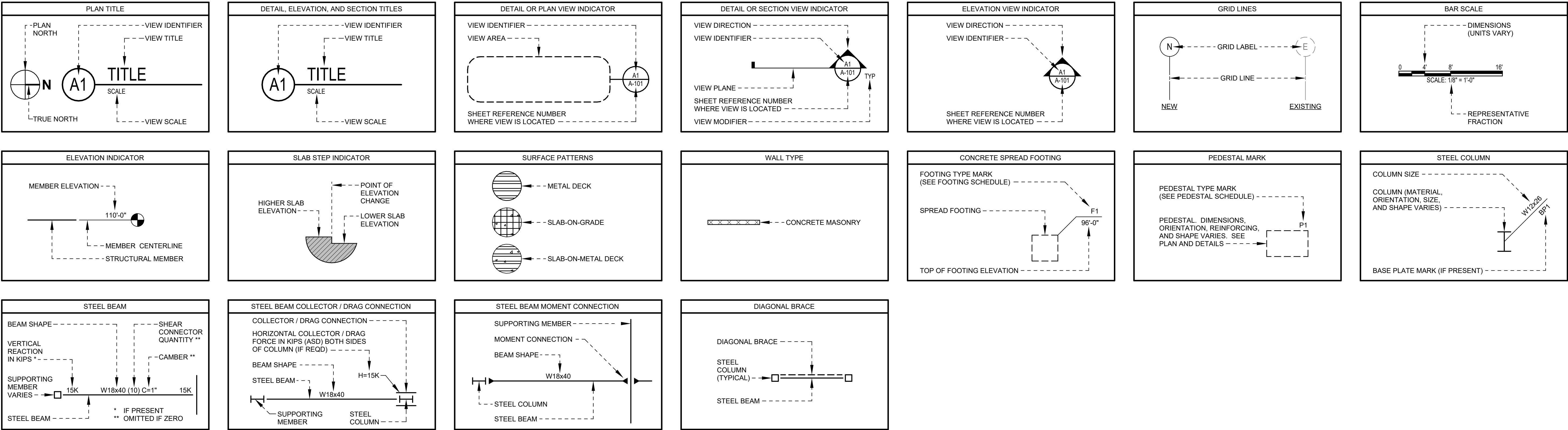
10. PERFORM QUALITY CONTROL AND INSPECTION DURING INSTALLATION IN ACCORDANCE WITH ACI 440.2R-17 AND THE MANUFACTURER'S RECOMMENDATIONS. NOTIFY THE ENGINEER OF ANY SUBSTRATE DEFICIENCIES THAT MAY AFFECT PERFORMANCE OF THE FRP SYSTEM.

11. PROTECT INSTALLED FRP FROM MECHANICAL DAMAGE, MOISTURE, ULTRAVIOLET EXPOSURE, CONTAMINATION, AND TEMPERATURES OUTSIDE THE MANUFACTURER'S RECOMMENDED LIMITS UNTIL THE SYSTEM HAS FULLY CURED. PROVIDE ANY PROTECTIVE COATINGS REQUIRED FOR ENVIRONMENTAL EXPOSURE OR FIRE PROTECTION WHERE INDICATED ON THE CONTRACT DOCUMENTS.

STRUCTURAL ABBREVIATIONS

Ø	DIAMETER	INT.	INTERIOR
AB	ANCHOR BOLT	K-FT.	KIP-FOOT
ADDL	ADDITIONAL	KIP.	THOUSAND POUNDS
AESS	ARCHITECTURAL EXPOSED STRUCTURAL STEEL	KSI.	KIPS PER SQUARE INCH
ALT	ALTERNATE	LBS	POUNDS
AR	ANCHOR ROD	LL	LIVE LOAD
ARCH	ARCHITECT(URAL)	LLV	LONG LEG HORIZONTAL
BL	BETWEEN	LV	LONG LEG VERTICAL
BS	BUILDING LINE OR BRICK LEDGE	LSH	LONG SIDE HORIZONTAL
BP	BASE PLATE	LSV	LONG SIDE VERTICAL
BOD.	BOTTOM-OF-DECK	LWC	LIGHTWEIGHT CONCRETE
BOS.	BOTTOM-OF-STEEL	MAX	MAXIMUM
BOT	BOTTOM	MC	MOMENT CONNECTION
BRG.	BEARING	MEP	MECHANICAL / ELECTRICAL / PLUMBING
BTWN	BETWEEN	MFR	MANUFACTURER
CFS	COLD-FORMED STEEL	MIL	ONE-THOUSANDTH OF AN INCH
CFSF	COLD-FORMED STEEL FRAMING	MIN	MINIMUM
CGS.	CENTER OF GRAVITY OF STRAND	MISC	MISCELLANEOUS
CIP	CAST-IN-PLACE	MPH	MILES PER HOUR
CJ	CONTROL JOINT	(N).	NEW
CJP	COMPLETE JOINT PENETRATION	NA	NOT APPLICABLE
CL	CENTERLINE	NSG	NON-SHANK GROUT
CLR	CLEAR	NTS	NOT-TO-SCALE
CMU	CONCRETE MASONRY UNIT	NWC	NORMAL WEIGHT CONCRETE
COL	COLUMN	OC.	ON-CENTER
CONC	CONCRETE	OPH	OPPOSITE HAND
CONN	CONNECTION	OPNG	OPENING
CONSTR	CONSTRUCTION	PAP	POWDER-ACTUATED FASTENER
CONT	CONTINUOUS	PCC	PRECAST CONCRETE
DBA	DEFORMED BAR ANCHOR	PCF	POUNDS PER CUBIC FOOT
DIA	DIAMETER	PEMB	PRE-ENGINEERED METAL BUILDING
DIM	DIMENSION	PF	PAN FORM
DL	DEAD LOAD	PL	PLATE
DTL	DETAIL	PLF	POUNDS PER LINEAR FOOT
DWG	DRAWING	PSF.	POUNDS PER SQUARE FOOT
DWL	DOWEL	PSI.	POUNDS PER SQUARE INCH
(E)	EXISTING	PT	POST-TENSIONED
EJ	EACH FACE	REF	REFER TO
EJ	EXPANSION JOINT	REINF	REINFORCING
EL	ELEVATION	REQD	REQUIRED
ENGR	ENGINEER	RLL	ROOF LIVE LOAD
EOR	ENGINEER-OF-RECORD	RTU	ROOFTOP UNIT
EQ	EQUAL	SCHED	SCHEDULE
EQL	EARTHQUAKE (SEISMIC) LOAD	SF	SQUARE FEET
EW	EAST WAY	SIM	SIMILAR
EXP	EXPANSION	SL	SNOW LOAD
EXST	EXISTING	SPEC	SPECIFICATION
EXT	EXTERIOR	SST	STAINLESS STEEL
FDTN	FOUNDATION	STD	STANDARD
FF	FINISH FLOOR	STIF	STIFFENER
FIN GR	FINISH GRADE	STIR	STIRRUP
FTG	FOOTING	T&B	TOP & BOTTOM
FV	FIELD VERIFY	TOC	TOP-OF-CONCRETE
GA	GAGE, GAUGE	TOF	TOP-OF-FOOTING
GALV	GALVANIZED	TOS	TOP-OF-STEEL
GB	GRADE BEAM	TOW	TOP-OF-WALL
GC	GENERAL CONTRACTOR	TYP	TYPICAL
GEN	GENERAL	UNO	UNLESS NOTED OTHERWISE
H	HORIZONTAL	V	VERTICAL
HORIZ.	HORIZONTAL	VERT	VERTICAL
HR	HOURL(S)	W/	WITH
HSA	HEADED STUD ANCHOR	WL	WIND LOAD
IN	INCHES)	WP	WORK POINT
INFO	INFORMATION	WWR	WELDED WIRE REINFORCEMENT

STRUCTURAL SHEETS SYMBOLOGY



APP'D

DESCRIPTION

DATE

REV #

APPROVED

CHIEF ENGINEER

CIVIL ENGINEER

DETAILS (1)

STRUCTURAL GENERAL NOTES

AIR MOBILITY COMMAND

19TH CIVIL ENGINEER SQUADRON

LITTLE ROCK, ARKANSAS

DATE: SEPT. 2026

DESIGNED BY: JG

DRAWN BY: KNS

BUILDING NO.: 2600756

PROJECT NO.:

SHEET REF.:

S-003

NO.:

1 OF XX

STATUS:65% PRELIMINARY DESIGN