

A B C D E F G H

MINIMUM LAP SPLICES OF REINFORCING BARS IN TENSION (PER ACI 318)					
f'c = 27.5MPa CONCRETE					
BAR SIZE	(--TOP BARS--)		(--OTHER BARS--)		
	CENTER TO CENTER BAR SPACING LESS THAN 4db	4db OR MORE	LESS THAN 4db	4db OR MORE	4db
#10	460	460	410	410	40
#13	660	610	510	480	50
#16	1020	760	790	580	60
#19	1450	910	1120	710	80
#22	1960	1090	1500	840	90
#25	2590	1450	1980	1120	100
#29	3280	1830	2510	1420	110
#32	4140	2340	3200	1780	130
#36	5080	2840	3910	2180	140

- NOTES:
- LAP SPLICES ABOVE ARE IN MILLIMETERS UNO.
 - YIELD STRENGTH OF REINFORCEMENT, fy, IS 400MPa (LAP SPLICE LENGTH IS IN MILLIMETERS).
 - CONCRETE IS NORMAL WEIGHT (2400kg/m).
 - TOP BAR INDICATES HORIZONTAL REINFORCEMENT WHICH IS PLACED ABOVE 300mm OR MORE OF FRESH CONCRETE.
 - SEE COLUMN SCHEDULE FOR COLUMN AND SHEAR WALL VERTICAL LAP SPLICE.
 - STRAIGHT DEVELOPMENT LENGTH OF AN UNLAPPED BAR IS EQUAL TO VALUE FROM TABLE DIVIDED BY 1.3. CATEGORY FOR BARS SPACED LESS THAN 4d, OR ON CENTER CORRESPONDS TO CATEGORY 1 IN THE CRSI HANDBOOK WHEREAS FOR BARS SPACED 4d, OR MORE ON CENTER CORRESPOND TO CRSI CATEGORY 5.

STEEL MATERIALS SCHEDULE		
STRUCTURAL ELEMENT	FY YIELD STRENGTH (MPa)	REMARKS
BEAMS & GIRDERS	250	ASTM A36M ASTM A6M
COLUMNS	240	ASTM A53-95 GRADE B ASTM A6M
MISC BRACING	250	ASTM A572M ASTM A6M
CONNECTIONS, PLATES, & ALL OTHERS	250	ASTM A36M ASTM A6M
ANCHOR BOLTS	-	ASTM A36M or A307M ASTM A6M
PIPES	240	ASTM A53-95 GRADE B ASTM A6M
TUBING	345	ASTM A500-93 GRADE C ASTM A6M
HIGH STRENGTH BOLTS	-	ASTM A325M-N
WELDING ELECTRODES	-	AWS D1.1-90 E70xx

CONCRETE COVER SCHEDULE	
MINIMUM CONCRETE COVER PROTECTION FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS: (SEE ACI 318-89M, SECTION 7.7 FOR CONDITIONS NOT NOTED). DIMENSIONS FOR BAR PLACEMENT GIVEN IN SECTIONS AND DETAILS SHALL SUPERSEDE MINIMUM COVER REQUIREMENTS GIVEN HERE. DIMENSIONS ARE IN mm.	
FOOTINGS (EARTH FORMED)	70
COLUMNS / PIERS	40
GRADE BEAMS OR SLAB TURNED DOWN EDGES:	
TOP	40
BOTTOM (EARTH FORMED)	70
SIDES (EARTH FORMED)	70
SIDES (BOARD FORMED)	40
#16 BAR & SMALLER	50
#19 THRU #36 BAR	40
SLABS-ON-GRADE (NO EXPOSURE TO WEATHER) FROM TOP	20
SLABS-ON-GRADE (EXPOSURE TO WEATHER) FROM TOP	40
UTILITY TUNNEL WALLS, RETAINING WALLS AND SHEAR WALLS, (NO SURFACES SHALL BE EARTH FORMED)	
EARTH SIDE AND FRONT SIDE (EXPOSED TO WEATHER):	
#16 BAR AND SMALLER	40
#19 THRU #36 BAR	50
PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED.	

SPREAD FOOTING AND PIER SCHEDULE									
MARK	FOOTING SIZE			FOOTING REINFORCING	PIER				REMARKS
	LENGTH	WIDTH	THICKNESS		SIZE	T/PIER	VERT. BARS	TIES	
F2	2500	2500	300	7-#16 E.W., T & B	450	0.0	8-#19	2 SETS #10 @ 125	HAIRPINS REQ'D. SEE DETAILS

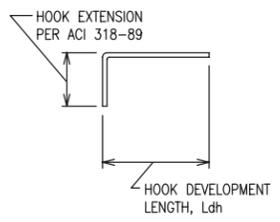
- NOTES:
- DIMENSIONS NOTED ARE MILLIMETERS (mm) U.N.O.
 - T/PIER EL GIVEN IN REFERENCE TO 0.0 mm DATUM OR FINISH FLOOR EL/SLAB EL, DISTANCE ABOVE OR BELOW INDICATED AS NEGATIVE OR POSITIVE.
 - PIER SIZE INDICATED IS SQUARE (DIMENSION SAME IN BOTH DIRECTIONS) U.N.O.

CONCRETE MATERIALS SCHEDULE	
STRUCTURAL ELEMENT	f'c CONCRETE COMPRESSIVE STRENGTH @ 28 DAYS (MPa)
SLAB-ON-GRADE/TURN-DOWN SLABS	27.5
ROOF AND FLOOR SLABS	27.5
ALL FOOTINGS (U.N.O.)	20
MISC. CURBS, WALLS AND PADS UND	27.5
CAST-IN-PLACE LINTEL	20
CONCRETE FRAMING - BEAMS AND COLUMNS	27.5

NOTES:

- ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE. (2400 Kg/m³ UND)

STANDARD HOOKS IN TENSION PER (ACI 318-89)		
HOOK DEVELOPMENT LENGTH Ldh (mm)		
BAR SIZE	f'c 20 MPa	f'c 27.5 MPa
#10	230	180
#13	280	250
#16	360	300
#19	430	380
#22	480	430
#25	560	480
#29	640	560
#32	710	610
#36	790	690



- NOTES:
- CONCRETE IS NORMAL WEIGHT CONCRETE.
 - BAR YIELD STRENGTH, fy = 400 MPa
 - SIDE COVER REQUIREMENTS OF ACI SECT. 12.5.3.2 ARE ASSUMED TO NOT BE MET.
 - TIE OR STIRRUP REQUIREMENTS OF ACI SECT. 12.5.3.2 ARE ASSUMED TO NOT BE MET.
 - REDUCTION FOR EXCESS REINFORCEMENT IS NOT TAKEN.
 - HOOK DEVELOPMENT LENGTH IS VALID FOR 180° HOOKS ALSO.
 - FOR 35 MPa CONCRETE, USE VALUES FOR 30 MPa



SYMBOL	DESCRIPTION	DATE

DESIGNED BY: BAKER	DATE: 09-30-09
DWN BY: RCG	SUBMITTED BY: BAKER
CHK BY: RTD	FILE NO.: ANPDS-003XXX

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AFGHAN NATIONAL POLICE
STANDARD DESIGN
ENTRY CONTROL POINT CANOPY
STRUCTURAL MATERIAL SCHEDULES

SHEET REFERENCE NUMBER:
S3

100% SUBMISSION

