GENERAL NOTES:

1) DESIGN SPECIFICATIONS : AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, LATEST EDITION ,TOGETHER WITH ANY TENTATIVE OR SUPPLEMENTAL SPECIFICATIONS APPROVED BY THE AASHTO COMMITTEE ON BRIDGES AND STRUCTURES.

2) LOADING:-
-DEAD LOAD INCLUDES 5.0cm OF FUTURE WEARING SURFACE.
-LIVE LOAD HS 20-44 (WITH 50% INCREASE IN WHEEL LOADIND TO ENCOUTER THE UNEXPECTED TRUCK LOADINGS) AS PER MPWH RECOMENDATIONS.

3) CONCRETE:-
-PLAIN & BLINDING CONCRETE TO BE CLASS C15-CHARACTERISTIC COMPRESSIVE CYLINDER STRENGTH OF 11.55 MPa AT 28 DAYS.
-REINFORCED CONCRETE CLASS C30 SHALL BE USED FOR RETAINING WALLS-CHARACTERISTIC COMPRESSIVE CYLINDER STRENGTH OF 24 MPa RESPECTIVELY AT 28 DAYS.

4) STEEL:-
-REINFORCING STEEL BARS SHALL BE DEFORMED BARS OF HIGH TENSILE STRENGTH , GRADE 60, CONFORMING TO JSS/441/1986 OR AASHTO M31M (ASTM , A615M) .

5) NO BARS PARTIALLY EMBEDDED IN CONCRETE SHALL BE FIELD BENT EXCEPT AS SHOWN ON THE DRAWINGS OR PERMITTED BY THE ENGINEER.

6) MINIMUM CLEAR COVER TO REINFORCEMENT , UNLESS OTHERWISE SPECIFIED , SHALL BE AS FOLLOWS :-
- RETAINING WALLS 50mm

7) ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 2cm UNLESS OTHERWISE NOTED.

8) THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS & ELEVATIONS SHOWN ON DRAWINGS AND SHALL NOTIFY THE ENGINEER OF ANY AND ALL DISCREPANCIES PRIOR TO THE COMMENCEMENT OF WORK.
IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PREPARE ALL NECESSARY DESIGNS & DRAWINGS TO THE APPROVAL OF THE ENGINEER. THE FAILURE OF THE CONTRACTOR TO REPORT ANY DISCREPANCY WILL BE TAKEN TO IMPLY HIS ACCEPTANCE TO TAKE FULL AND TOTAL RESPONSIBILITY FOR THE CORRECTNESS OF THE DESIGN AND ITS EXECUTION AS SHOWN ON THE DRAWINGS TO THE SATISFACTION OF THE ENGINEER.

9) ALL EXPOSED CONCRETE SURFACES ABOVE GROUND LEVEL TO BE SMOOTH AND FAIR FACED TO THE SATISFACTION OF THE ENGINEER AND CONFORM WITH CLASS (F1) FINISH - AS DEFINED BY THE SPECIFICATIONS -.

10) IN THE EVENT THAT THE SOIL ALLOWABLE BEARING CAPACITY FOR FOOTINGS AND BASES BE FOUND TO BE LESS THAN THE DESIGN FOUNDATION PRESSURE SPECIFIED IN THE DESIGN DRAWINGS , THE DEPTH OR DIMENSIONS OF FOOTING OR BASE SHALL BE CHANGED BY THE CONTRACTOR.

11) LOCATION OF REINFORCEMENT LAP SPLICES & CONSTRUCTION JOINTS ARE SUBJECT TO THE APPROVAL OF THE ENGINEER.

BAR SIZE mm	DEVELOPMENT LENGTH			LAP SPLICE LENGTH		
	COMP.	TENSION BARS		COMP.	TENSION BARS	
	NOT ENCLOSED	TOP BARS	OTHER BARS	NOT ENCLOSED	TOP BARS	OTHER BARS
12	270	340	300	360	440	390
16	360	460	330	480	600	430
20	460	660	470	600	860	610
25	570	1030	740	740	1340	960
32	730	1690	1210	950	2200	1570
36	820	2140	1530	1070	2780	1990
40	910	2420	1730	1190	3150	2250

REINFORCEMENT DEVELOPMENT AND LAP SPLICE LENGTHS

NOTES FOR TABLE:-

I) LENGTHS IN TABLE ARE BASED ON A CONCRETE COMPRESSIVE CYLIDER STRENGTH OF 210 Kg/cm^2 AND DEFORMED REINFORCING STEEL CONFORMING TO THE STRENGTH REQUIREMENTS OF ASTM-A615 GRADE 60. (FY = 410 MPa)

II) ALL TABLE VALUES ARE IN MILLIMETERS.

III) VALUES GIVEN IN TABLE ARE FOR BARS SPACED AT LEAST 15 cm CENTERS

IV) FOR OTHER CONDITIONS THE FOLLOWING MULTIPLIES SHALL BE USED:
A. TENSION BARS SPACED LESS THAN 15cm CENTERS
= 1.25 x TABLE VALUE
B. 3-BAR BUNDLES IN TENSION OR COMPRESSION
= 1.20 x TABLE VALUE
C. 4-BAR BUNDLES IN TENSION OR COMPRESSION
= 1.33 x TABLE VALUE
D. LAPS FOR EACH BAR IN A BUNDLE SHALL BE STAGGERED.
E. IF Fy IS LESS THAN 410 MPa MULTIPLY TABLE VALUES BY Fy / 410.
F. IF Fc' IS GREATAR THAN 210 Kg/cm^2 MULTIPLY TABLE VALUES BY $\sqrt{210 / Fc'}$, EXCEPT MINIMUM LENGTH SHALL BE 30cm

V) TOP BARS ARE HORIZONTAL BARS, SUCH AS IN WALLS, BEAMS AND SLABS, SO PLACED THAT MORE THAN 30 cm OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.

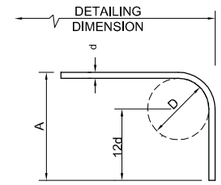
VI) NO SPLICING OF STEEL BARS IS PERMITTED UNLESS OTHERWISE SHOWN ON THE DRAWINGS.

VII) LAP SPLICES SHALL NOT BE USED IN LOCATIONS OF MAXIMUM MOMENTS.

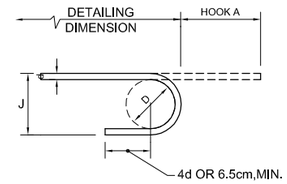
VIII) THE VALUES OF TENSION LAP SPLICES SHOWN IN TABLE ARE FOR CLASS "B" SPLICES. FOR OTHER SPLICE CONDITIONS THE FOLLOWING MULTIPLIERS SHALL BE USED :
A. CLASS "A" SPLICE = 0.77 x TABL VALUE.
B. CLASS "C" SPLICE = 1.31 x TABLE VALUE.
C. CLASS "D" SPLICE = 1.54 x TABLE VALUE.
AND FOR SPLICE CLASS DESCRIPTION SEE AASHTO.

LEGEND

B : BOTTOM
T : TOP
EF : EACH FACE
OF: OUTSIDE FACE
IF : INSIDE FACE



90° HOOK

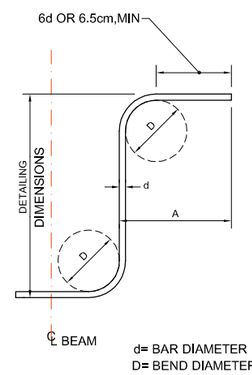


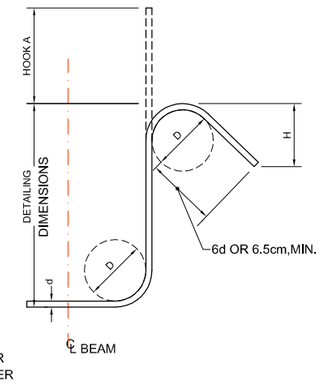
180° HOOK

BAR SIZE mm	D=6d FOR 8 TO 25 D=8d FOR 30 TO 32 STANDARD 180° HOOK			D=6d FOR 8 TO 25 D=8d FOR 30 TO 32 STANDARD 90° HOOK	
	HOOK A	J	D	A	D
8	130	64	48	128	48
10	140	80	60	160	60
12	150	96	72	192	74
14	165	112	84	224	84
16	180	128	96	256	96
20	230	160	120	320	120
25	280	250	150	400	150
30	410	300	240	510	240
32	440	320	256	544	256

fy= 410 MPa
d= BAR DIAMETER
D= BEND DIAMETER

REINFORCEMENT STANDARD HOOK DETAILS





d= BAR DIAMETER
D= BEND DIAMETER

NOTE : TIE BENDS ARE SIMILAR TO STIRRUP HOOK SHOWN

90° HOOK 135° HOOK

BAR SIZE mm	D	90° HOOK	135° HOOK	
		A	HOOK A	H
8	40	100	110	70
10	50	110	120	75
12	60	120	130	80
14	65	135	145	90
16	70	150	160	100
20	80	180	210	130

REINFORCEMENT STIRRUP AND TIE HOOK DIMENSIONS

PROJECT LOCATION :	CLIENT :	CONSULTANT :	Rev.	Description	Date	Drawn	Checked	Approved	Designed By : H. HATTAR	Drawn By : A. ABU HAMDEH	Checked By : H. HATTAR	PROJECT NAME :	Drawing Title :	Drawing No. :
AMMAN / JORDAN	Greater Amman Municipality	CONSOLIDATED CONSULTANTS GROUP, Tel + 962 6 4612377 Fax +962 6 4612380, 73 Al Mutanabbi Street 4th Circle, P.O. Box 89 07 46 Amman 11189 Jordan, www.cclg.com							Approved By : H. SALHI	Date : June.2018	Scale : (A1) Sheet N.T.S	AMMAN BRT STRUCTURAL DESIGN	STRUCTURAL GENERAL NOTES	ST-01