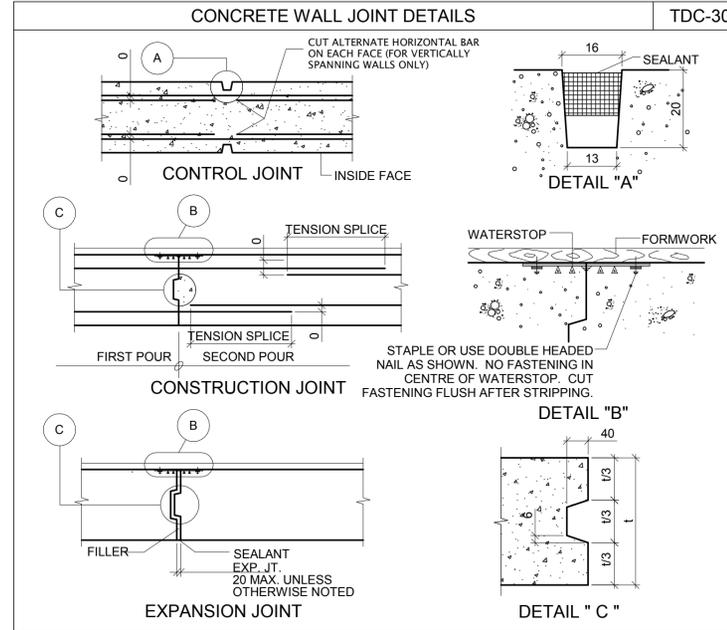


TEMPERATURE REINFORCEMENT FOR CONCRETE SLABS, COVER SLABS AND TOPPINGS TDC-14

CONCRETE THICKNESS (mm)	REINFORCEMENT	NOTES:
50	152 x 152 - MW13.3 x MW13.3	<ol style="list-style-type: none"> UNLESS OTHERWISE NOTED PROVIDE TEMPERATURE REINFORCEMENT IN CONCRETE SLABS, COVER SLABS AND TOPPINGS AS SHOWN IN THIS TABLE. UNLESS OTHERWISE NOTED, PLACE TEMPERATURE REINFORCEMENT PERPENDICULAR TO MAIN REINFORCEMENT IN ONE WAY SLABS, WHERE MAIN REINFORCEMENT CONSISTS OF TOP AND BOTTOM BARS. PLACE TEMPERATURE REINFORCEMENT ALTERNATELY AT TOP AND BOTTOM. UNLESS OTHERWISE NOTED, PROVIDE WELDED WIRE FABRIC IN FLAT SHEETS. PROVIDE REINFORCEMENT FOR CONCRETE TOPPING WHICH IS PLACED OVER A SLIP SHEET OR MEMBRANE. TEMPERATURE REINFORCEMENT IS NOT REQUIRED WHERE CONCRETE TOPPINGS ARE PLACED AND BONDED DIRECTLY ON CONCRETE SLABS. UNLESS OTHERWISE NOTED, PLACE WELDED WIRE FABRIC WITH 25 mm TOP COVER. LAP REBARS WITH CLASS 'B' LAP SPLICE. LAP END OF WELDED WIRE FABRIC SUCH THAT THE OVERLAP MEASURED BETWEEN THE OUTERMOST CORSS-WIRES OF EACH FABRIC SHEET SHALL NOT BE LESS THAN ONE SPACING OF CROSS-WIRE PLUS 50 mm. UNLESS OTHERWISE NOTED, PROVIDE EDGE OF ALL SLABS WITH 2-15 CONTINUOUS. IN UNHEATED AREAS, INCREASE REINFORCEMENT BY 25%.
65	152 x 152 - MW18.7 x MW18.7	
75	152 x 152 - MW25.8 x MW25.8	
90	152 x 152 - MW25.8 x MW25.8	
100	102 x 102 - MW13.3 x MW13.3	
100	10@500	
110	10@450	
120	10@400	
130	10@380	
140	10@350	
150	10@330	
160	10@310	
170	10@290	
180	10@270	
190	10@260	
200	10@250	
210	10@230	
220	10@220	
230	10@210	
240	10@200	
250	10@200	
260	15@380	
270	15@370	
280	15@350	
290	15@340	
300	15@330	

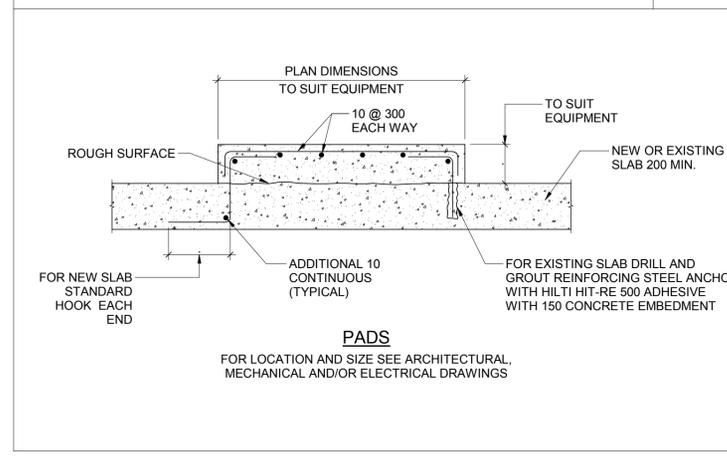


MINIMUM EMBEDMENT LENGTHS FOR DEFORMED BARS (Fy = 460 MPa) TDC-37

BAR SIZE	TENSION, Ld (CLASS A)										COMPRESSION			
	fc=35MPa		fc=40MPa		fc=45MPa		fc=50MPa		fc=55MPa		fc=35MPa	fc=40MPa	fc=45MPa	fc=50MPa & 55MPa
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS				
T8	420	320	390	300	360	300	350	300	330	300	200	200	200	200
T10	530	410	490	380	460	350	430	330	410	310	200	200	200	200
T12	630	490	580	450	550	420	520	400	490	380	250	250	250	250
T16	840	650	780	600	730	560	690	530	650	500	330	320	320	320
T20	1050	810	970	750	910	700	860	660	820	630	410	400	400	400
T25	1640	1260	1520	1170	1420	1100	1340	1030	1270	980	510	500	500	500
T32	2100	1620	1950	1500	1820	1400	1720	1320	1630	1250	650	640	640	640
T40	2630	2020	2440	1870	2280	1750	2150	1650	2040	1570	810	800	800	800

- NOTES:**
- TOP BARS ARE HORIZONTAL BARS LOCATED SUCH THAT MORE THAN 300mm OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR (EQ. TOP BARS OF BEAMS AND SLABS DEEPER THAN 300mm AND HORIZONTAL WALL REINFORCING).
 - UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, COMPRESSION EMBEDMENT SHALL BE PROVIDED FOR COLUMN BARS ONLY AND TENSION EMBEDMENT FOR ALL OTHER REINFORCEMENT.
 - BAR SPLICE (LAP) LENGTHS SHOWN ARE BASED ON ACI-318-02 CL. 12.2.2 AND 12.3 RESPECTIVELY.

PAD DETAILS TDC-18



CONCRETE COVER TO REINFORCING STEEL TDC-34

	MINIMUM COVER CSA-A23.1	MINIMUM COVER CSA-S413 (SEE NOTE #4)	MINIMUM COVER FOR FIRE-RESISTANCE RATING			
			1.5 h	2 h	3 h	4 h
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:	75		75	75	75	75
CONCRETE CAST AGAINST FORMS, BUT EXPOSED TO EARTH OR WEATHER: 15 BARS, 16Ø WIRE AND SMALLER, STIRRUPS, TIES, AND SPIRAL	40		40	40	40	40
COLUMN PRINCIPAL REINFORCEMENT 20 TO 55 BARS, AND ALL OTHER BARS	50		50	50	65	75
CONCRETE NOT EXPOSED TO WEATHER, OR NOT IN CONTACT WITH GROUND: 35 BARS AND SMALLER FOR SLABS AND WALLS SEE NOTE #3	20	TOP 40 BOT. 30	20	25	35	40
FOR JOISTS	20		25	25	40	50
BEAM PRINCIPAL REINFORCEMENT	40		40	40	40	50
COLUMN PRINCIPAL REINFORCEMENT	40		50	50	65	75
STIRRUPS, TIES, SPIRALS, AND ALL OTHER BARS	40		40	40	40	40

NOTES:

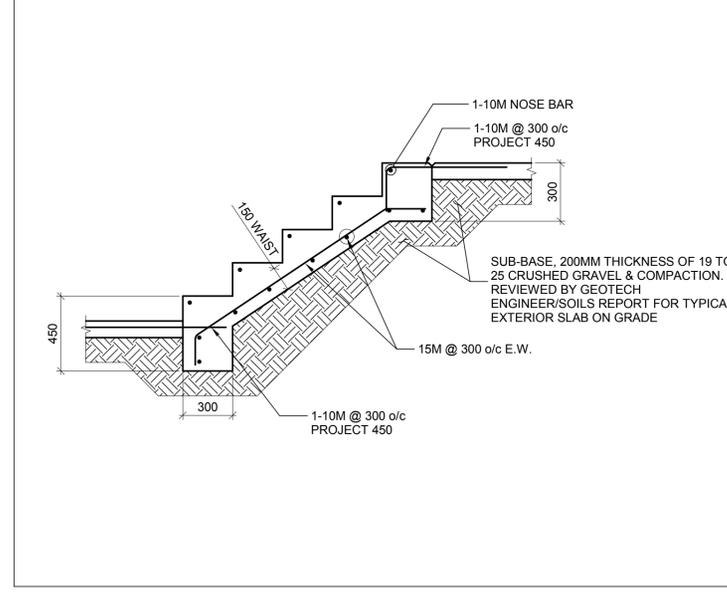
- FOR CAST-IN-PLACE (NON-PRESTRESSED) CONCRETE, PROVIDE MINIMUM CONCRETE COVER TO REINFORCEMENT ACCORDING TO CSA-A23.1 UNLESS OTHERWISE NOTED ON DRAWINGS.
- WHERE THE FIRE-RESISTANCE RATING OF A COLUMN EXCEEDS 2 HOURS, ADD WELDED WIRE MESH, MINIMUM 102 x 102 - MW3.2 x MW3.2, MIDWAY IN CONCRETE COVER.
- FOR SHORT WALLS WHERE INDICATED ON THE DRAWING, PROVIDE COVER SAME AS FOR COLUMNS.
- FOR PARKING STRUCTURES PROVIDE MINIMUM CONCRETE COVER TO REINFORCEMENT ACCORDING TO CSA-S413. COVER TO BOTTOM REINFORCEMENT IN THE MAIN FLOOR SLAB EXPOSED TO DEICING MUST MEET REQUIREMENTS OF CSA-S413.

MINIMUM LAP LENGTHS FOR DEFORMED BARS (Fy = 400 MPa) TDC-38

BAR SIZE	TENSION (CLASS B)										COMPRESSION		
	fc=35MPa		fc=40MPa		fc=45MPa		fc=50MPa		fc=55MPa		fc>25MPa		
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	REGULAR LAPS	COLUMN W/TIES	COLUMN W/SPIRALS
T8	550	420	510	390	470	360	450	350	420	330	300	300	300
T10	680	530	630	490	590	460	560	430	530	410	370	300	300
T12	820	630	760	580	710	550	670	520	640	490	440	360	330
T16	1090	840	1010	780	950	730	890	690	850	650	580	480	440
T20	1370	1050	1270	970	1180	910	1120	860	1060	820	730	600	550
T25	2140	1640	1980	1520	1850	1420	1750	1340	1660	1270	910	750	680
T32	2740	2100	2530	1950	2370	1820	2230	1720	2120	1630	1160	960	870
T40	-	-	-	-	-	-	-	-	-	-	1450	1200	1090

- NOTES:**
- TOP BARS ARE HORIZONTAL BARS LOCATED SUCH THAT MORE THAN 300 mm OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR (EQ. TOP BARS OF BEAMS AND SLABS DEEPER THAN 300 mm AND HORIZONTAL WALL REINFORCING).
 - UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS, COMPRESSION EMBEDMENT SHALL BE PROVIDED FOR COLUMN BARS ONLY AND TENSION EMBEDMENT FOR ALL OTHER REINFORCEMENT.
 - BAR SPLICE (LAP) LENGTHS SHOWN ARE BASED ON ACI-318-02 CL. 12.15 AND 12.16 RESPECTIVELY.

STAIR SUPPORTED ON GRADE TDC-49



MINIMUM DEVELOPMENT AND LAP SPLICE LENGTHS IN COMPRESSION TDC-35

BAR SIZE	Fy MPa	DEVELOPMENT LENGTHS (ldc)			LAP SPLICE
		fc = 20 MPa	fc = 25 MPa	fc = 30 MPa	
10	400	240	220	200	300
10	500	300	270	250	430
15	400	340	310	280	440
15	500	430	380	350	640
20	400	420	370	340	580
20	500	520	470	430	850
25	400	540	480	440	730
25	500	680	600	550	1070
30	400	640	570	530	880
30	500	800	720	660	1280
35	400	770	690	630	1030
35	500	960	860	790	1490
45	400	940	840	770	
45	500	1170	1050	960	
55	400	1210	1080	990	
55	500	1510	1350	1240	

NOTES:

- VALUES GIVEN ARE FOR NORMAL WEIGHT CONCRETE AND DEFORMED BARS ONLY AND ARE TO BE MODIFIED ACCORDING TO THE FOLLOWING APPLICABLE FACTORS.
- LAP SPLICES ARE NOT PERMITTED FOR BAR SIZES 45 AND 55.
- ldc DENOTES MINIMUM DEVELOPMENT LENGTH FOR EMBEDMENT OF DOWELS IN COMPRESSION.
- INCREASE LAP SPLICE LENGTHS FOR fc LESS THAN 20 MPa BY A FACTOR OF 1.33.
- MINIMUM LAP SPLICE AND DEVELOPMENT LENGTHS MAY BE REDUCED UNDER THE FOLLOWING SPECIAL CONDITIONS BY THE FACTORS SHOWN:
a) EXCESS AREA OF STEEL (AS REQUIRED/AS PROVIDED)
USE 1.0 UNLESS NOTED OTHERWISE.
b) BARS ENCLOSED WITH A SPIRAL WHICH HAS A MINIMUM WIRE DIA. OF 6 AND 100 MAXIMUM PITCH 0.75
- AFTER APPLYING ALL APPLICABLE FACTORS OF NOTES 4 AND 5, THE LAP SPLICE LENGTHS SHALL NOT BE MADE LESS THAN 300 AND THE DEVELOPMENT LENGTHS SHALL NOT BE MADE LESS THAN 200.

REPUBLIC ARCHITECTURE INC

385 St. Mary Avenue
Winnipeg, MB R3C 0N1

T 204 989 0102
F 204 989 0094
www.republicarchitecture.ca



NORR

2300, 411 1st Street SE,
Calgary, Alberta, Canada T2G 4Y5
norr.com

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Victor Smith, Architect, AAA, B.Arch, MABC
Bruce McKenzie, Architect, AAA, B.Arch, MABC
A. Shih Siddiqui, Architect, AAA, B.Arch, MABC
Annie Torkala, P.Eng., APEGA
Chris Pat, P.Eng., APEGA

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3	ISSUED FOR 90% REVIEW	2019/08/29
2	ISSUED FOR 60% REVIEW	2019/05/09
1	ISSUED FOR 30% REVIEW	2019/03/14

PSPC

10025 JASPER AVE
EDMONTON, ALBERTA, T5J 1S6
PH. 780-919-9445

Project title: JASPER STAFF HOUSING CONSTRUCTION

Project Duplex
720 PATRICIA STREET,
JASPER, AB, T0E 1E0

Designed by	Conçu par
H.Sun	
Drawn by	Dessiné par
D.Kuang	
Approved by	Approuvé par
A.Elshafey	
PHSQC Project Manager / Administrateur de Projets TPSQC	
ROB HAFER	
Drawing Title	Titre du dessin

TYPICAL DETAILS