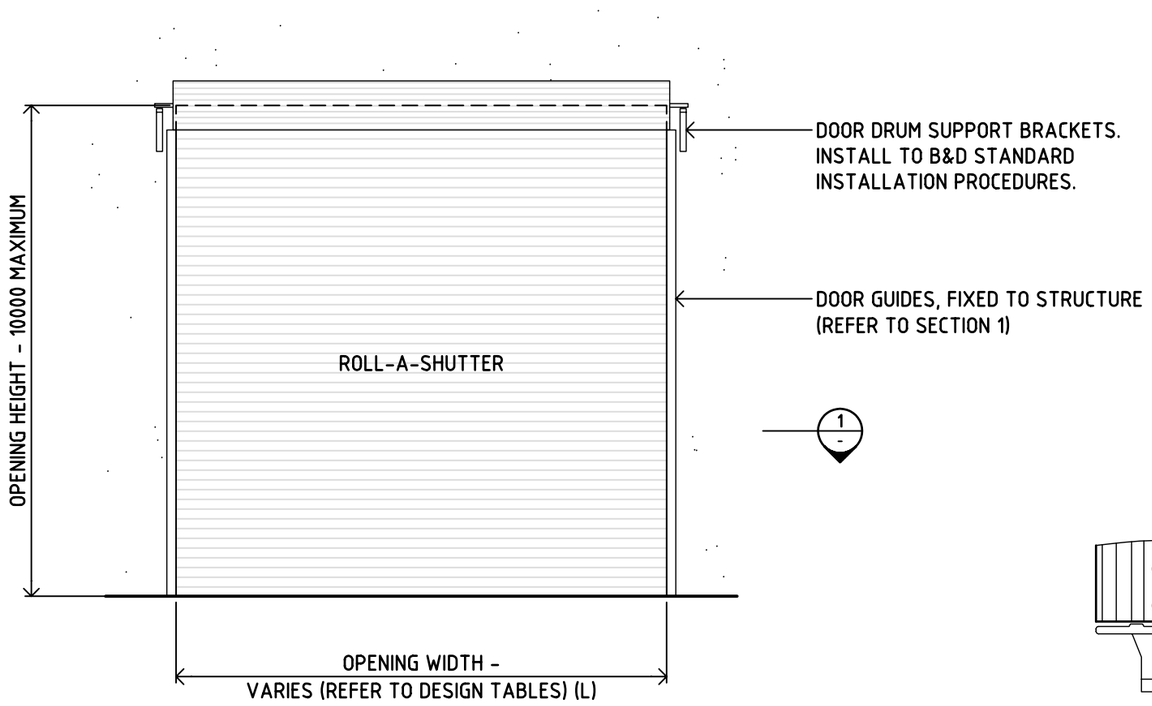
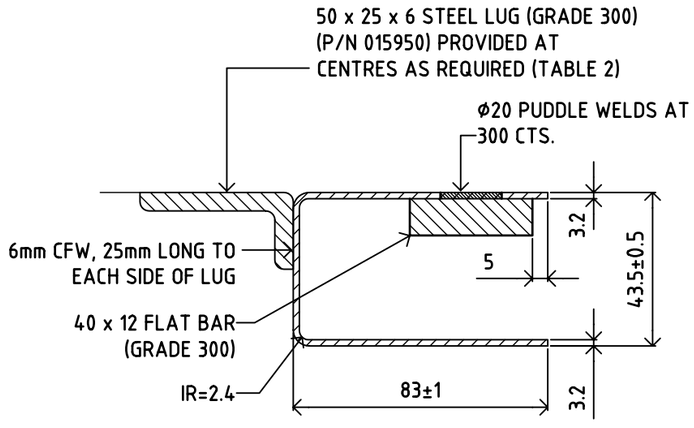


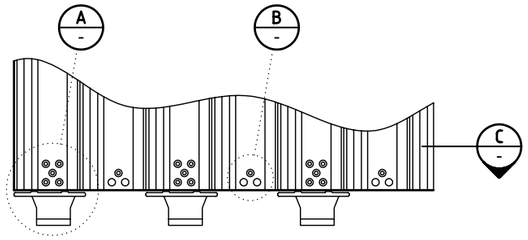
ROLL-A-SHUTTER DOOR ELEVATION - TYPICAL

SCALE 1:50



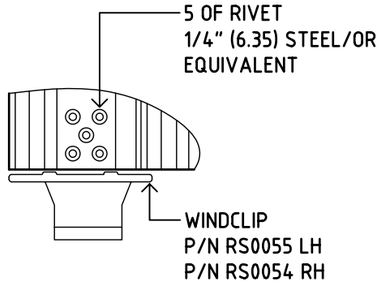
CHANNEL GUIDE DETAIL

SCALE 1:2



CHANNEL PART PLAN

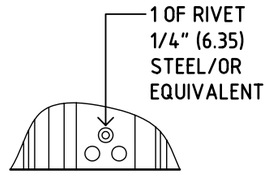
SCALE 1:10



DETAIL A

SCALE = 1:5

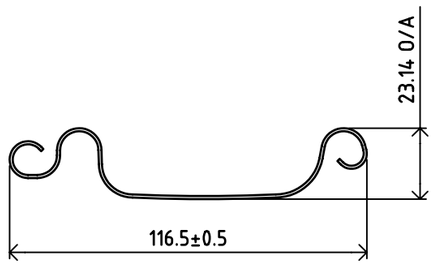
WINDLOCK CLIP SLAT DETAIL



DETAIL B

SCALE = 1:5

UNCLIPPED SLAT DETAIL



SECTION C

SCALE = 1:2

DETAILED DIMENSION OF CURTAIN SLAT
AS PER DRAWING No. BD1630 Issue 5

CURTAIN SLAT TYPES

4/100, 6/100, 8/100, 10/100 & 12/100

NOTES :

DESIGN CRITERIA

- (REFER ALSO TO NOTES COVERING BASIS OF DRAWINGS & LIMITATIONS)
- WIND REGION A-D
- TERRAIN CATEGORY 2-3 (AS/NZS 1170.2:2011)
- DOOR HEIGHT 10m MAX.
- INTERNAL PRESSURE COEFFICIENTS:
  REGION A & B
  Cpi = (+0.2,-0.3) NOMINAL
  REGION C & D
  Cpi = (+0.6,-0.3) NOMINAL
- BUILDING IMPORTANCE = LEVEL 2
- REGION WIND SPEED:
  REGION A: VR = 45m/s
  REGION B: VR = 57m/s
  REGION C: VR = 69.3m/s
  REGION D: VR = 88m/s
- DOORS ARE RATED UP TO AN ULTIMATE DESIGN WIND PRESSURE FOR A GIVEN OPENING WIDTH (L) AS NOMINATED IN TABLE 1, AS WELL AS FIGURES 1 & 6.
- CURTAIN HEIGHT = OPENING HEIGHT
- OPENING WIDTH = CURTAIN WIDTH - CURTAIN OVERLAP (REFER SECTION 1 ON DRAWINGS S02 & S03).

LIMITATIONS

- (REFER ALSO TO NOTES COVERING BASE OF DRAWINGS AND DESIGN CRITERIA)
- STEEL ABUTMENT POSTS TO BE 3mm (MIN.) IN THICKNESS WITH A MINIMUM STRESS GRADE OF G250.
- CHARACTERISTIC UNCONFINED COMPRESSIVE STRENGTH OF BLOCK WALL UNIT (f'uc) = 15 MPa (MIN.).
- CORE FILLING OF BLOCKWALL (f'c) = 15 MPa (MIN.).
- ALL DOOR COMPONENTS TO BE IN ACCORDANCE WITH STANDARD B&D ROLL-A-SHUTTER MANUFACTURING.
- DOOR INSTALLATION TO BE IN ACCORDANCE WITH STANDARD B&D ROLL-A-SHUTTER INSTALLATION AND PROCEDURES.
- THE STRUCTURE TO WHICH THE DOOR IS ATTACHED SHALL BE ASSESSED AND CERTIFIED INDEPENDENTLY AS REQUIRED BY A SUITABLY QUALIFIED ENGINEER.
- ALTERNATIVE DESIGN PARAMETERS TO WHAT ARE SPECIFIED ON THESE DRAWINGS ALONG WITH ALTERNATIVE SITE SPECIFIC LOCAL PRESSURE FACTORS MAY BE ADOPTED PROVIDED THE CALCULATED ULTIMATE DESIGN WIND PRESSURES DO NOT EXCEED THE VALUES GIVEN IN TABLE 1 AND FIGURES 1 & 6.
- THE BUILDING DESIGN ENGINEER IS TO ENSURE THAT THE SITE SPECIFIC DESIGN WIND LOADINGS DO NOT EXCEED THE ULTIMATE DESIGN WIND PRESSURE RATING PROVIDED IN TABLE 1 AND FIGURES 1 & 6 FOR ANY GIVEN SPAN.
- DOORS MAY BE POSITIONED AT ANY LOCATION ALONG THE BUILDING ENVELOPE INCLUDING ALL LOCAL PRESSURE ZONES (ie. CORNERS OF BUILDINGS), PROVIDED THE CALCULATED ULTIMATE DESIGN WIND PRESSURES DO NOT EXCEED THE VALUES PROVIDED IN TABLE 1 AND FIGURES 1 & 6.
- MECHANICAL BOLTS OR ANKASCREW FIXINGS TO BE GALVANISED.
- COEFFICIENT OF FRICTION (μ) BETWEEN ALL STEEL SURFACES HAS BEEN ASSUMED TO BE NO LESS THAN 0.3.

NOTES COVERING BASIS OF DRAWINGS

- TEST REPORT NO. TS914 (CYCLONE TESTING STATION, SCHOOL OF ENGINEERING AND PHYSICAL SCIENCES, JAMES COOK UNIVERSITY).
- EXPERIMENTS CONDUCTED ON THE 9th APRIL, 2nd MAY AND 6th MAY, 2013.
- PRINCIPLES OF MECHANICS.
- AS/NZS 1170.2:2011 STRUCTURAL DESIGN ACTIONS-PART 2: WIND ACTIONS.
- AS/NZS 1170.0:2002 STRUCTURAL DESIGN ACTIONS-PART 0:GENERAL PRINCIPLES.
- AS/NZS 1170.1:2002 STRUCTURAL DESIGN ACTIONS PART 1: PERMANENT, IMPOSED AND OTHER ACTIONS.
- AS/NZS 4505:2012 GARAGE DOORS AND OTHER LARGE ACCESS DOORS
- AS 3700:2001 MASONRY STRUCTURES
- AS 3600-2009 CONCRETE STRUCTURES
- AS/NZS 4600:2005 COLD FORMED STEEL STRUCTURES
- AS 4100:1998 STEEL STRUCTURES.
- RAMSET SPECIFIERS RESOURCE BOOK.
- REFER TO DESIGN CRITERIA AND LIMITATIONS.

ISSUE	DATE	AMENDMENTS
B	08.07.13	CONSTRUCTION ISSUE
C	16.09.13	PRELIMINARY ISSUE
D	30.10.13	ISSUED FOR FINAL DISCUSSION
E	02.11.13	CONSTRUCTION ISSUE
F	02.06.14	GENERAL REVISION

CLIENT: B&D AUSTRALIA PTY LTD

PROJECT: B&D 100mm ROLL-A-SHUTTER DOORS FOR USE IN ALL WIND REGIONS

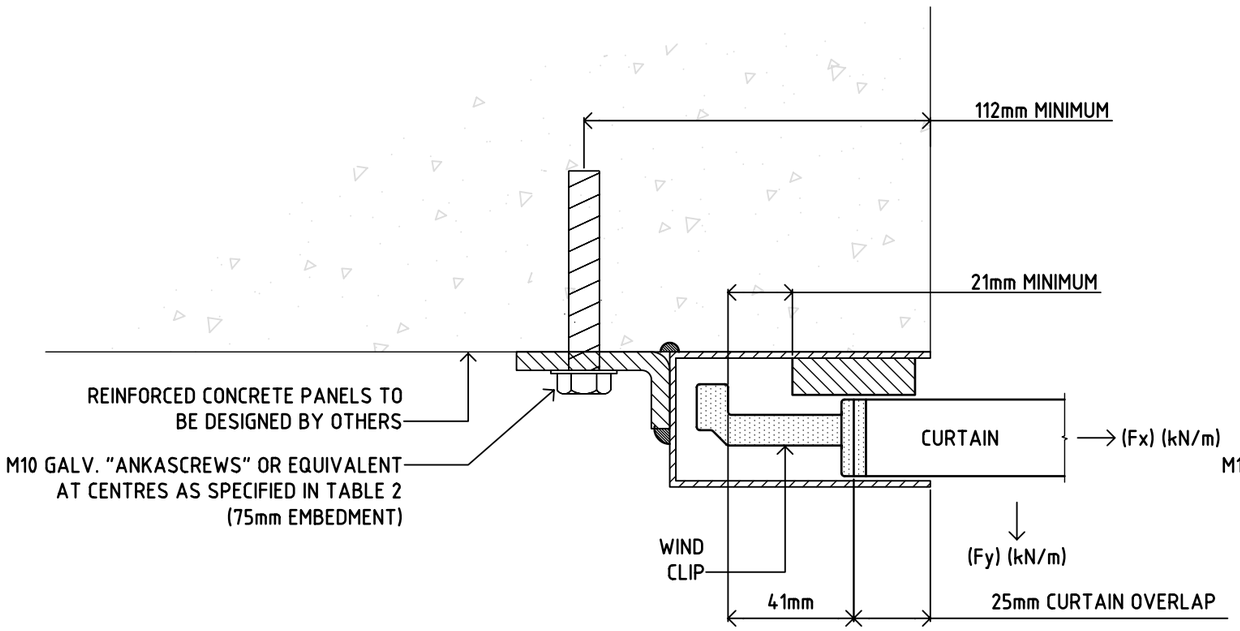
DRAWING: 100mm SERIES ROLL-A-SHUTTER DOOR ELEVATION, DETAILS AND NOTES

James Ellis & Associates
Consulting Structural Engineers

SCALE
DESIGNED J.E.
DRAWN AAB
CHECKED& APPROVED
DATE June 2014

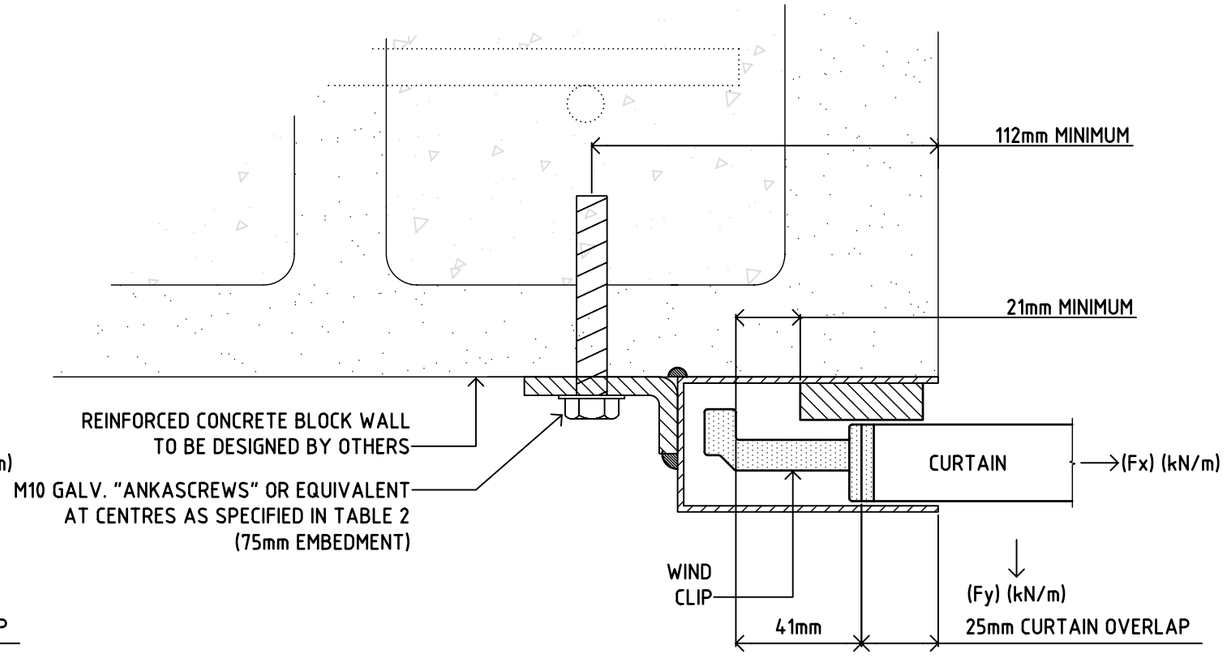
DRAWING No. S01 F

PROJECT No. 2288



SECTION 1/S01 PLAN
SCALE = 1:2

TYPE 1 FIXING - CHANNEL GUIDE WITH LUGS SUPPORTED
ONTO REINFORCED CONCRETE PANELS



SECTION 1/S01 PLAN
SCALE = 1:2

TYPE 1 FIXING - CHANNEL GUIDE WITH LUGS SUPPORTED ONTO
REINFORCED CONCRETE CORE FILLED MASONRY UNITS

ISSUE	DATE	AMENDMENTS
C	16.09.13	PRELIMINARY ISSUE
D	30.10.13	ISSUED FOR FINAL DISCUSSION
E	02.11.13	CONSTRUCTION ISSUE
F	02.06.14	GENERAL REVISION

CLIENT: B&D AUSTRALIA PTY LTD

PROJECT: B&D 100mm ROLL-A-SHUTTER DOORS
FOR USE IN ALL WIND REGIONS

DRAWING: 100mm SERIES ROLL-A-SHUTTER
DOOR DETAILS. SHEET 1

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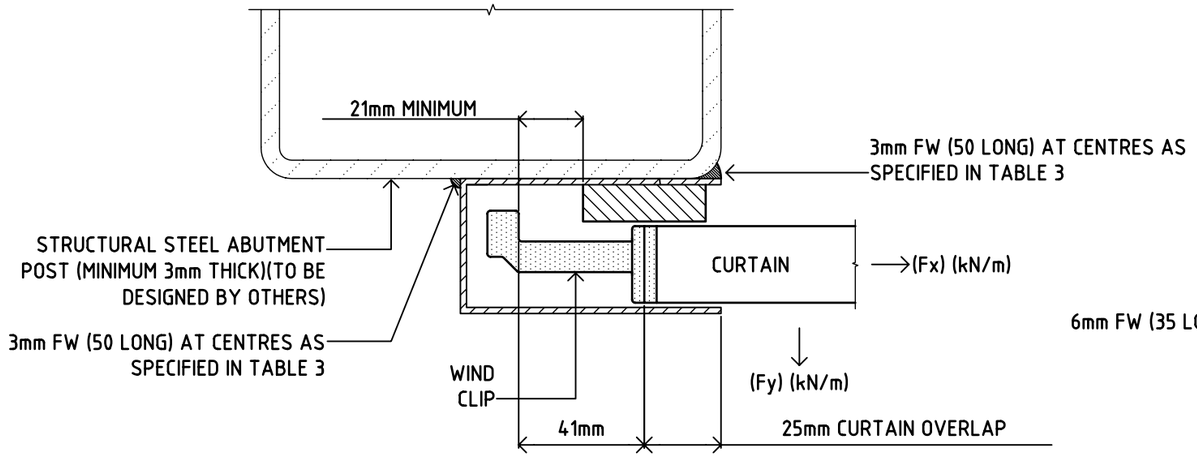
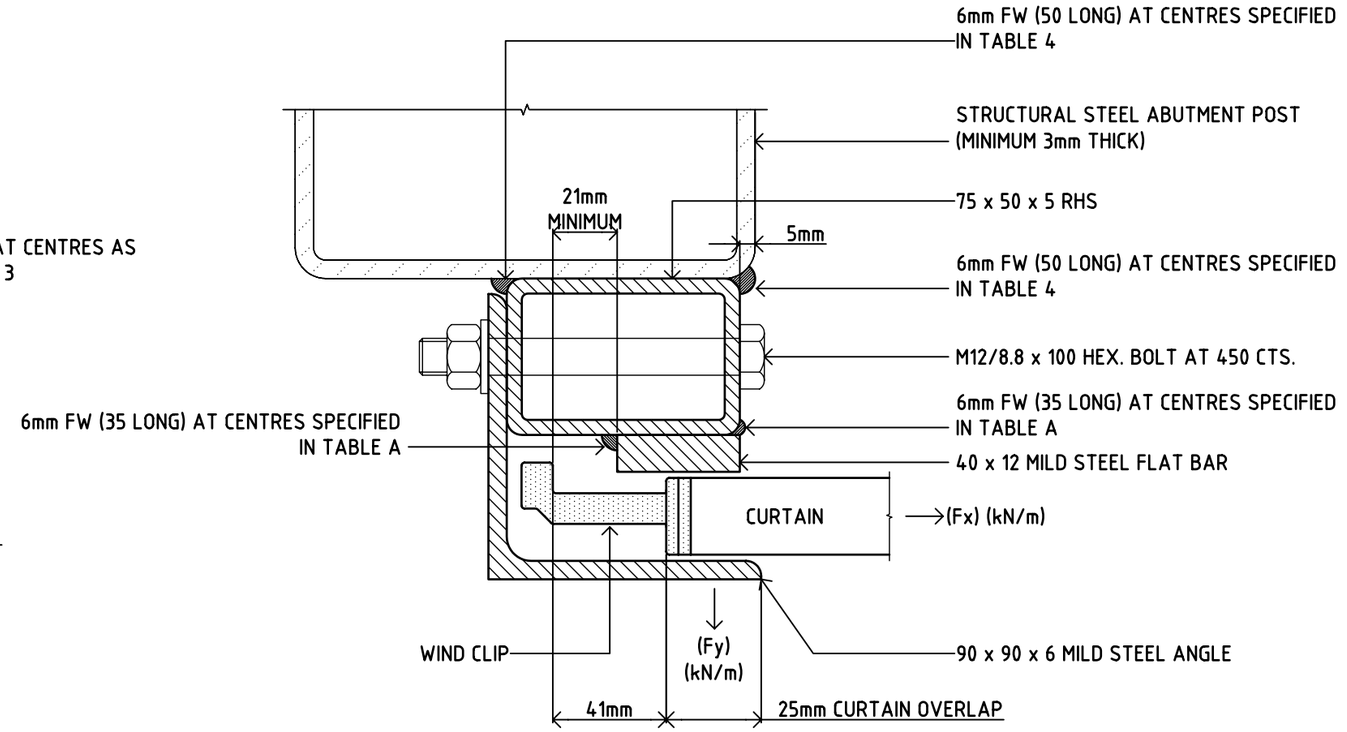


SECTION 1/S01 PLAN
SCALE = 1:2

TYPE 2 FIXING - CHANNEL GUIDE WITHOUT LUGS WELDED TO STRUCTURAL STEEL ABUTMENT



SECTION 1/S01 PLAN
SCALE = 1:2

TYPE 3 FIXING - FABRICATED GUIDE WELDED TO STRUCTURAL STEEL ABUTMENT

ISSUE	DATE	AMENDMENTS
C	16.09.13	PRELIMINARY ISSUE
D	30.10.13	ISSUED FOR FINAL DISCUSSION
E	02.11.13	CONSTRUCTION ISSUE
F	02.06.14	GENERAL REVISION

CLIENT: B&D AUSTRALIA PTY LTD

PROJECT: B&D 100mm ROLL-A-SHUTTER DOORS FOR USE IN ALL WIND REGIONS

DRAWING: 100mm SERIES ROLL-A-SHUTTER DOOR DETAILS. SHEET 2

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DATE June 2014

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PROJECT No. 2288

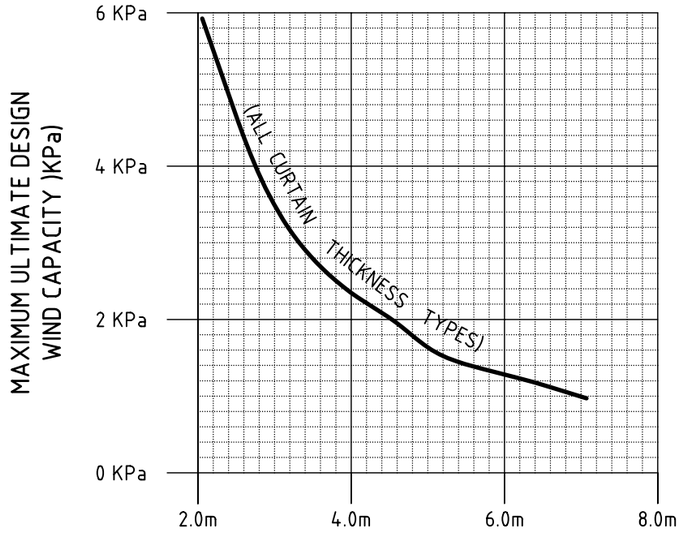


FIGURE 6: ULTIMATE DESIGN WIND CAPACITY FOR A GIVEN SPAN (CLIPS AT EVERY 4th SLAT)

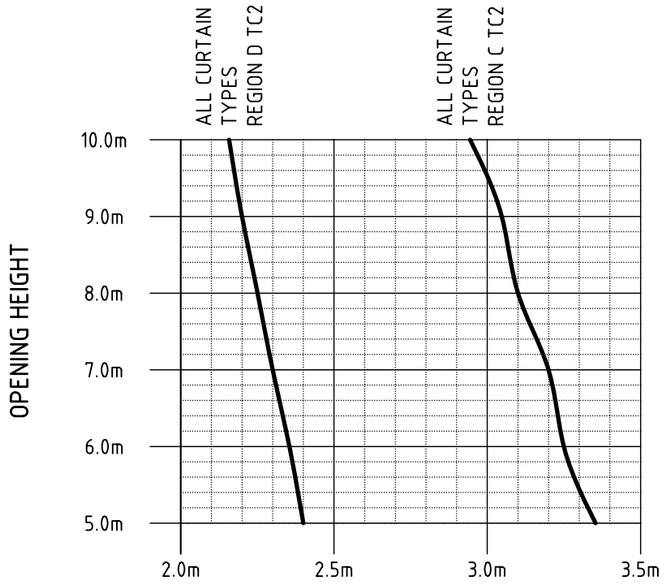
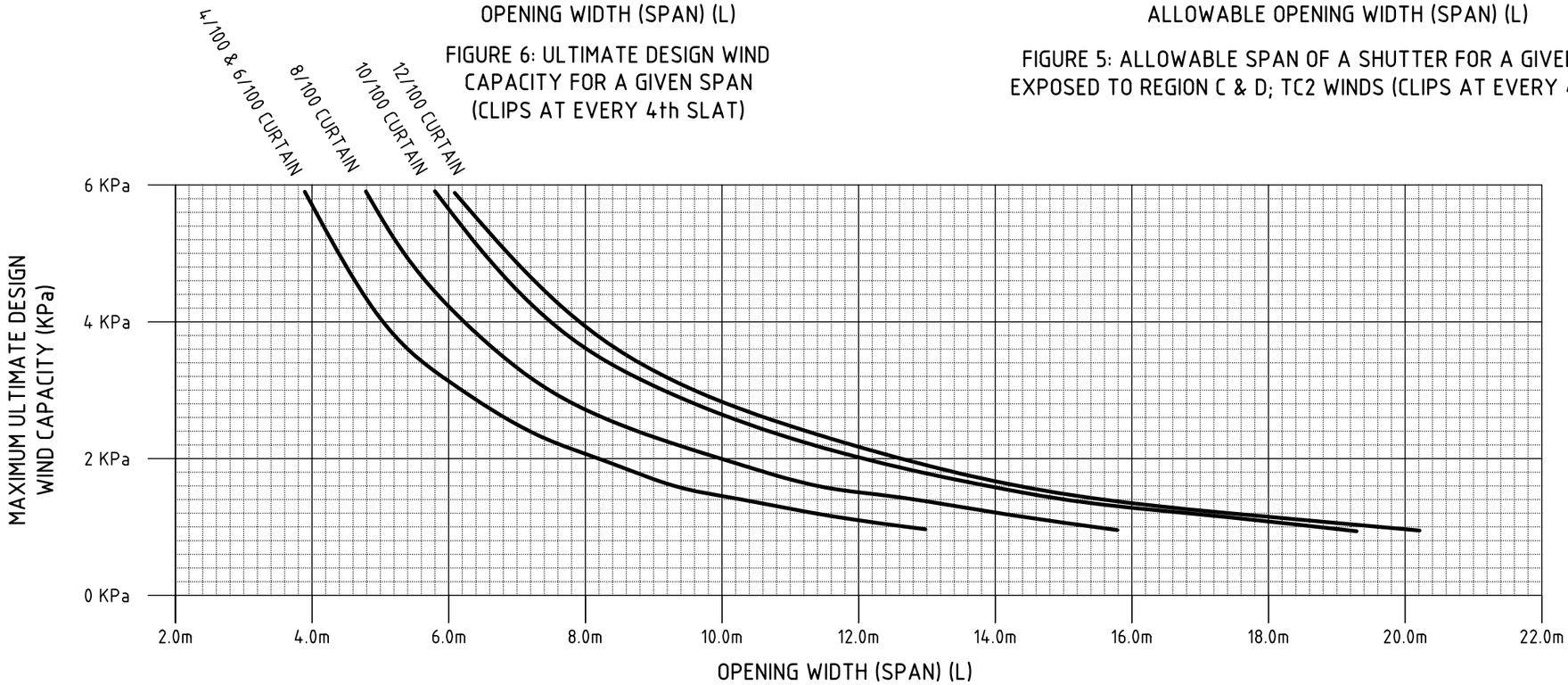


FIGURE 5: ALLOWABLE SPAN OF A SHUTTER FOR A GIVEN HEIGHT EXPOSED TO REGION C & D; TC2 WINDS (CLIPS AT EVERY 4th SLAT)



NOTE: CURTAIN WIDTH = OPENING WIDTH + CURTAIN OVERLAP

FIGURE 1: ULTIMATE DESIGN WIND CAPACITY FOR A GIVEN SPAN (CLIPS AT EVERY 2nd SLAT)

ISSUE	DATE	AMENDMENTS
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E	02.11.13	CONSTRUCTION ISSUE
F	02.06.14	GENERAL REVISION

CLIENT: B&D AUSTRALIA PTY LTD

PROJECT: B&D 100mm ROLL-A-SHUTTER DOORS FOR USE IN ALL WIND REGIONS

DRAWING: 100mm SERIES ROLL-A-SHUTTER DOOR TABLES AND DETAIL

James Ellis & Associates
Consulting Structural Engineers

SCALE

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CHECKED& APPROVED

DATE June 2014

DRAWING No. S04 F

PROJECT No. 2288

TABLE 1 - REFERENCE GUIDE ON MAXIMUM ALLOWABLE OPENING WIDTHS (L) FOR A GIVEN WIND PRESSURE

MAXIMUM ALLOWABLE OPENING WIDTHS FOR DOOR HEIGHTS UP TO 10m												
			4/100 SLAT		6/100 SLAT		8/100 SLAT		10/100 SLAT		12/100 SLAT	
REGION	TERRAIN CATEGORY	ULTIMATE DESIGN WIND PRESSURE	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT
A	2	1.42 KPa	10.10m	5.55m	10.25m	5.55m	12.35m	5.55m	15.00m	5.55m	15.75m	5.55m
	2.5	1.19 KPa	11.40m	6.25m	11.50m	6.25m	13.90m	6.25m	16.90m	6.25m	17.70m	6.25m
	3	0.98 KPa	13.00m	7.05m	13.20m	7.05m	15.80m	7.05m	19.30m	7.05m	20.20m	7.05m
B	2	2.28 KPa	7.40m	4.05m	7.50m	4.05m	9.00m	4.05m	10.95m	4.05m	11.50m	4.05m
	2.5	1.91 KPa	8.30m	4.55m	8.40m	4.55m	10.15m	4.55m	12.30m	4.55m	12.90m	4.55m
	3	1.57 KPa	9.45m	5.15m	9.60m	5.15m	11.60m	5.15m	14.10m	5.15m	14.75m	5.15m
C	2	3.66 KPa	5.40m	2.95m	5.45m	2.95m	6.55m	2.95m	8.00m	2.95m	8.40m	2.95m
	2.5	3.07 KPa	6.05m	3.30m	6.10m	3.30m	7.40m	3.30m	9.00m	3.30m	9.40m	3.30m
D	2	5.91 KPa	3.90m	2.15m	3.95m	2.15m	4.80m	2.15m	5.80m	2.15m	6.10m	2.15m
	2.5	4.95 KPa	4.40m	2.40m	4.45m	2.40m	5.40m	2.40m	6.55m	2.40m	6.85m	2.40m

TABLE 2 - REFERENCE GUIDE ON FASTENING SPECIFICATIONS FOR TYPE 1 FIXING ONTO REINFORCED BLOCKWORK OR REINFORCED CONCRETE ABUTMENTS

FASTENING SPECIFICATIONS FOR TYPE 1 FIXING ONTO REINFORCED BLOCKWORK OR REINFORCED CONCRETE ABUTMENTS			
ABUTMENT TYPE	CURTAIN TYPE	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT
15 MPa REINFORCED BLOCK WALL	4/100	M10 ANKASCREWS AT 200 CTS.	M10 ANKASCREWS AT 500 CTS.
	6/100	M10 ANKASCREWS AT 200 CTS.	M10 ANKASCREWS AT 500 CTS.
	8/100	M10 ANKASCREWS AT 125 CTS.	M10 ANKASCREWS AT 500 CTS.
	10/100	M10 ANKASCREWS AT 80 CTS.	M10 ANKASCREWS AT 500 CTS.
	12/100	M10 ANKASCREWS AT 80 CTS.	M10 ANKASCREWS AT 500 CTS.
20 MPa CONCRETE WALL	4/100	M10 ANKASCREWS AT 225 CTS.	M10 ANKASCREWS AT 500 CTS.
	6/100	M10 ANKASCREWS AT 225 CTS.	M10 ANKASCREWS AT 500 CTS.
	8/100	M10 ANKASCREWS AT 150 CTS.	M10 ANKASCREWS AT 500 CTS.
	10/100	M10 ANKASCREWS AT 90 CTS.	M10 ANKASCREWS AT 500 CTS.
	12/100	M10 ANKASCREWS AT 90 CTS.	M10 ANKASCREWS AT 500 CTS.
25 MPa CONCRETE WALL	4/100	M10 ANKASCREWS AT 275 CTS.	M10 ANKASCREWS AT 500 CTS.
	6/100	M10 ANKASCREWS AT 275 CTS.	M10 ANKASCREWS AT 500 CTS.
	8/100	M10 ANKASCREWS AT 175 CTS.	M10 ANKASCREWS AT 500 CTS.
	10/100	M10 ANKASCREWS AT 100 CTS.	M10 ANKASCREWS AT 500 CTS.
	12/100	M10 ANKASCREWS AT 100 CTS.	M10 ANKASCREWS AT 500 CTS.
32 MPa CONCRETE WALL	4/100	M10 ANKASCREWS AT 300 CTS.	M10 ANKASCREWS AT 500 CTS.
	6/100	M10 ANKASCREWS AT 300 CTS.	M10 ANKASCREWS AT 500 CTS.
	8/100	M10 ANKASCREWS AT 200 CTS.	M10 ANKASCREWS AT 500 CTS.
	10/100	M10 ANKASCREWS AT 125 CTS.	M10 ANKASCREWS AT 500 CTS.
	12/100	M10 ANKASCREWS AT 125 CTS.	M10 ANKASCREWS AT 500 CTS.

TABLE 3 - REFERENCE GUIDE ON FASTENING SPECIFICATIONS FOR TYPE 2 FIXING ONTO STRUCTURAL STEEL ABUTMENTS

FASTENING SPECIFICATION FOR TYPE 2 FIXINGS ONTO STRUCTURAL STEEL ABUTMENTS			
ABUTMENT TYPE	CURTAIN TYPE	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT
STEEL	4/100	3mm FW AT 500 CTS.	3mm FW AT 800 CTS.
	6/100	3mm FW AT 500 CTS.	3mm FW AT 800 CTS.
	8/100	3mm FW AT 400 CTS.	3mm FW AT 800 CTS.
	10/100	3mm FW AT 300 CTS.	3mm FW AT 800 CTS.
	12/100	3mm FW AT 300 CTS.	3mm FW AT 800 CTS.

NOTE: USE GRADE 550 FOR GUIDES

TABLE 4 - REFERENCE GUIDE ON FASTENING SPECIFICATIONS FOR RHS FIXING ONTO STRUCTURAL STEEL ABUTMENTS (TYPE 3)

FASTENING SPECIFICATION FOR RHS FIXINGS ONTO STRUCTURAL STEEL ABUTMENTS (TYPE 3)			
ABUTMENT TYPE	CURTAIN TYPE	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT
STEEL	4/100	6mm FW AT 600 CTS.	6mm FW AT 1200 CTS.
	6/100	6mm FW AT 600 CTS.	6mm FW AT 1200 CTS.
	8/100	6mm FW AT 450 CTS.	6mm FW AT 1200 CTS.
	10/100	6mm FW AT 300 CTS.	6mm FW AT 1200 CTS.
	12/100	6mm FW AT 300 CTS.	6mm FW AT 1200 CTS.

TABLE A - FASTENING OF MILD STEEL FLAT BAR TO FABRICATED GUIDE (TYPE 3 FIXING)

FASTENING CENTRES OF MILD STEEL FLAT BAR TO RHS GUIDE		
CURTAIN TYPE	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT
4/100	6mm FW AT 400 CTS.	6mm FW AT 600 CTS.
6/100	6mm FW AT 400 CTS.	6mm FW AT 600 CTS.
8/100	6mm FW AT 300 CTS.	6mm FW AT 600 CTS.
10/100	6mm FW AT 250 CTS.	6mm FW AT 600 CTS.
12/100	6mm FW AT 250 CTS.	6mm FW AT 600 CTS.

TABLE 5 - MAXIMUM ULTIMATE DESIGN CATENARY FORCE (Fx) PER METRE HEIGHT BASED ON MAXIMUM ALLOWABLE OPENING WIDTHS

MAXIMUM ULTIMATE DESIGN CATENARY FORCE (Fx) PER METRE HEIGHT		
CURTAIN TYPE	WINDCLIPS EVERY 2nd SLAT	WINDCLIPS EVERY 4th SLAT
4/100	45.76 KN/m	18.3 KN/m
6/100	46.58 KN/m	18.3 KN/m
8/100	61.48 KN/m	18.3 KN/m
10/100	82.335 KN/m	18.3 KN/m
12/100	88.83 KN/m	18.3 KN/m

NOTE: THE MAXIMUM ULTIMATE DESIGN CATENARY FORCES HAVE BEEN DERIVED USING THE MAXIMUM ALLOWABLE WIND PRESSURE FOR A GIVEN SPAN (REFER TO TABLE 1)

NOTE 1: $Fy = \frac{WL}{2}$
WHERE Fy = MAXIMUM OUT OF PLANE ULTIMATE DESIGN ABUTMENT FORCE (PER METRE HEIGHT)
W = ULTIMATE DESIGN WIND PRESSURE (kPa)
L = OPENING WIDTH (SPAN) (m)

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F	02.06.14	GENERAL REVISION

CLIENT: B&D AUSTRALIA PTY LTD

PROJECT: B&D 100mm ROLL-A-SHUTTER DOORS FOR USE IN ALL WIND REGIONS

DRAWING: 100mm SERIES ROLL-A-SHUTTER DOOR TABLES

James Ellis & Associates
Consulting Structural Engineers

SCALE
DESIGNED J.E.
DRAWN AAB
CHECKED& APPROVED
DATE June 2014

DRAWING No. S05 F

PROJECT No. 2288

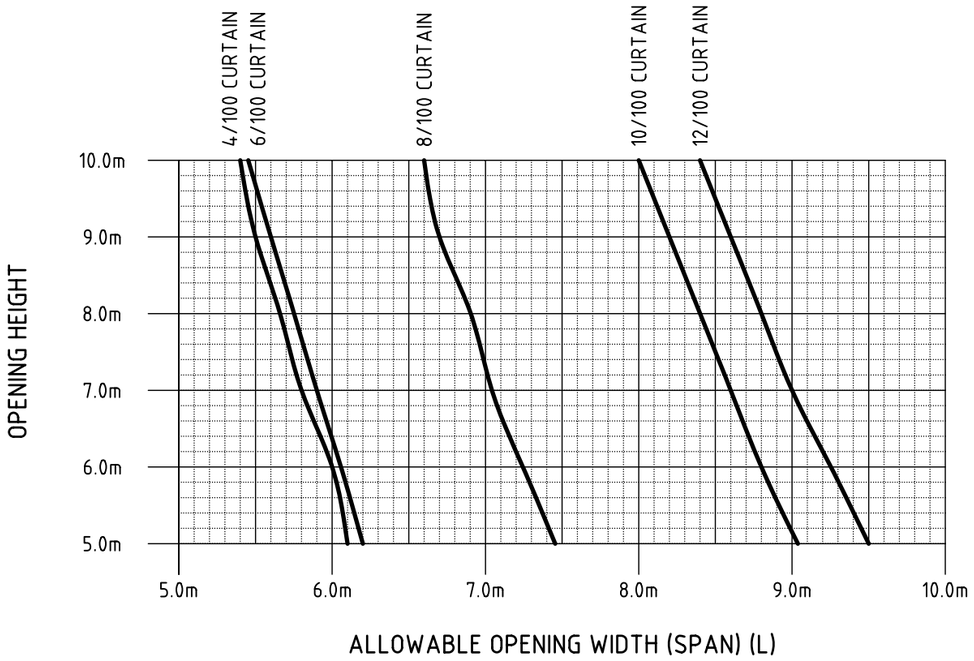

FIGURE 2: ALLOWABLE SPAN OF A SHUTTER FOR A GIVEN HEIGHT EXPOSED TO REGION C TC2 WINDS (CLIPS AT EVERY 2nd SLAT)

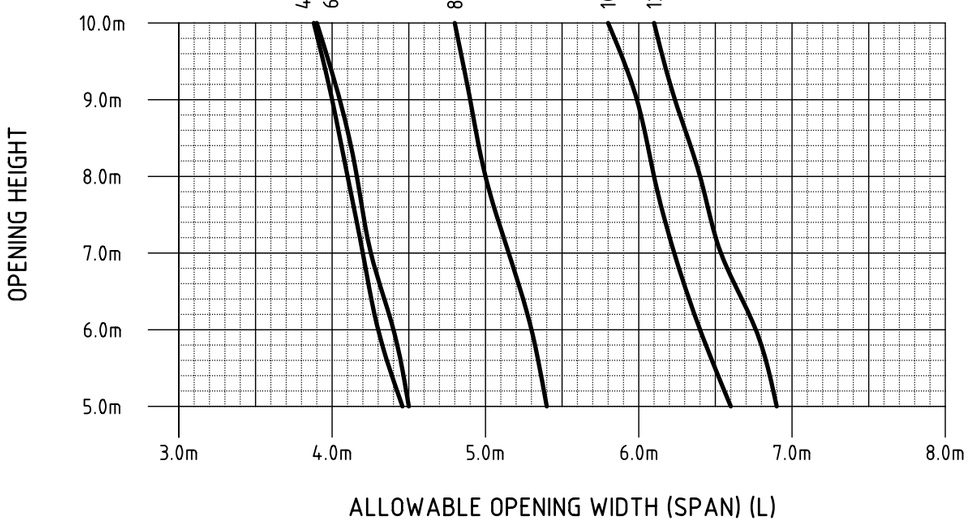

FIGURE 3: ALLOWABLE SPAN OF A SHUTTER FOR A GIVEN HEIGHT EXPOSED TO REGION D TC2 WINDS (CLIPS AT EVERY 2nd SLAT)

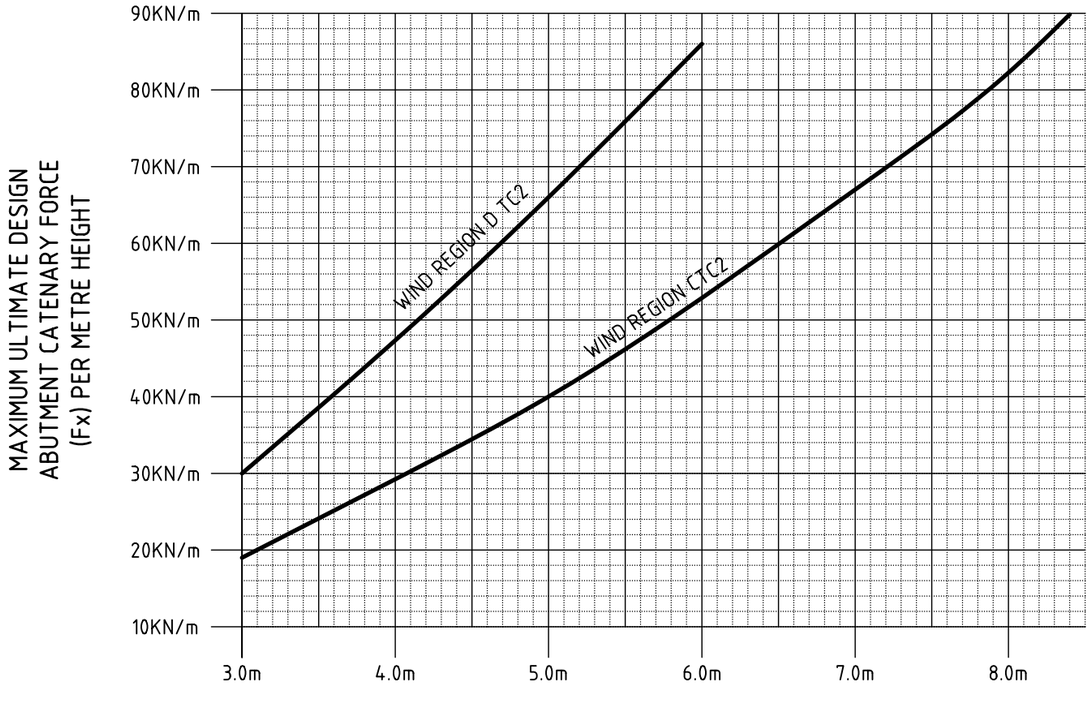

FIGURE 4: ULTIMATE DESIGN CATENARY FORCE FOR A GIVEN SPAN AND WIND CATEGORY

NOTE 1: $Fy = \frac{WL}{2}$

WHERE Fy = MAXIMUM OUT OF PLANE ULTIMATE DESIGN ABUTMENT FORCE (PER METRE HEIGHT)
W = ULTIMATE DESIGN WIND PRESSURE (kPa)
L = OPENING WIDTH (SPAN) (m)

ISSUE	DATE	AMENDMENTS
D	30.10.13	ISSUED FOR FINAL DISCUSSION
E	02.11.13	CONSTRUCTION ISSUE
F	02.06.14	GENERAL REVISION

CLIENT: B&D AUSTRALIA PTY LTD

PROJECT: B&D 100mm ROLL-A-SHUTTER DOORS FOR USE IN ALL WIND REGIONS

DRAWING: 100mm SERIES ROLL-A-SHUTTER DOOR TABLES. SHEET 1

James Ellis & Associates
Consulting Structural Engineers

SCALE
DESIGNED J.E.
DRAWN AAB
CHECKED& APPROVED
DATE June 2014

DRAWING No. S06 F

PROJECT No. 2288