## List of Figures

Figure Number	Title	Page Number
1.1	Vibration trend graph of 1120kW centrifugal blower motor	4
1.2	Vibration trend graph of 9.3 kW motor mounted blower	4
3.1	Direct driven centrifugal blower	15
3.2	Motor mounted centrifugal blower	15
3.3	Belts driven centrifugal blower	15
3.4	Blower mounted over a steel base frame and bolted to	17
2.5	Schematic distance of the blower with motor and apositions	17
3.3	Vibratian (avial) trand of DDL 10 blaver MODE bearing	1/
3.0	Vibration (axia) trend of DBL-10 blower MINDE bearing	18
3./	Vibration (vertical) trend of DBL-10 blower MNDE bearing	18
3.8	bearing	19
3.9	Vibration (axial) trend of DBL-10 blower MDE bearing	19
3.10	Vibration (vertical) trend of DBL-10 blower MDE bearing	19
3.11	Vibration (horizontal) trend of DBL-10 blower MDE bearing	20
3.12	Spectrum analysis of MNDE bearing horizontal axis	20
3.13	Schematic sketch of the blower with motor and specifications	21
3.14	Motor mounted blower (DBL-13)	22
3.15	Vibration (axial) trend DBL-13 blower MNDE bearing	22
3.16	Vibration (vertical) trend DBL-13 blower MNDE bearing	23
3.17	Vibration (horizontal) trend DBL-13 blower MNDE bearing	23
3.18	Vibration(axial)trend of DBL-13 blower MDE bearing	23
3.19	Vibration(vertical)trend of DBL-13 blower MDE bearing	24
3.20	Vibration(horizontal)trend of DBL-13 blower MDE bearing	24
3.21	Spectrum analysis indicate structural looseness of the base frame	25
3.22	Spectrum analysis after welding stiffener on the base frame	25
3.22	Schematic sketch of the blower with motor and specifications	25
3.25	Motor mounted blower (DBL-15)	26
3.25	Vibration trend of DBL 15(axial) of MNDE bearing	20
3.25	Vibration trend of DBL-15(vertical) of MNDE bearing	27
3.20	Vibration trend of DBL-15(vertical) of MNDE bearing	28
3.28	Vibration trend of DBL-15(axial) of MDE bearing	28
3.29	Vibration trend of DBL-15(vertical) of MDE bearing	28
3.30	Vibration trend of DBL-15(vertical) of MDE bearing	28
3.31	Spectrum analysis of measuring point indicates mechanical	20
0.01	looseness	_>
3.32	Schematic sketch of the blower with motor and specifications	30
3.33	Picture of the blower mounted on the motor	31
3.34	Vibration trend of DBL-25(axial) of MNDE bearing	31
3.35	Vibration trend of DBL-25(vertical) of MNDE bearing	32

3.36	Vibration trend of DBL-25(horizontal) of MNDE bearing	32
3.37	Vibration trend of DBI-25(axial) of MDE bearing	32
3.38	Vibration trend of DBI-25(horizontal) of MDE bearing	33
3.39	Vibration trend of DBI-25(vertical) of MDE bearing	33
3.40	Spectrum analysis indicates structural looseness	34
Figure	Title	Page
Number		Number
3.41	Stiffeners welded on base frame	34
3.42	Additional stiffeners welded on base frame	34
3.43	Schematic sketch of the blower with motor and specifications	35
3.44	Picture of the blower(DBL-26) mounted on the motor	36
3.45	Vibration trend of DBL-26 (axial) of MNDE bearing	36
3.46	Vibration trend of DBL-26 (vertical) of MNDE bearing	37
3.47	Vibration trend of DBL-26 (horizontal) of MNDE bearing	37
3.48	Vibration trend of DBL-26(axial) of MDE bearing	37
3.49	Vibration trend of DBL-26(vertical) of MDE bearing	38
3.50	Vibration trend of DBL-26(horizontal) of MDE bearing	38
3.51	Spectrum analysis shows structural looseness	38
3.52	Stiffeners welded on the base frame during the course of time	39
4.1	Three layers of base/structure of a motor mounted blower	42
4.2	Motor mounted blower placed on RCC foundation	45
4.3	Drawing of the civil foundation	46
4.4	ISMC150 (a), ISMB(b) Box fabricated unit with 2 IiSMC-	46
	150	
4.5	The ISMC structure getting fabricated at the workshop	47
4.6	Outlet throttle valve with the adjustable throttle lever	47
4.7	Flow chart of the experimental procedure	48
4.8	Parameters that were set for the experiments	48
4.9	Measuring point tree	49
4.10	Facsimile copy of the data collection format	50
4.11	Conducting the experiment	51
4.12	Team members who conducted the experiment	51
4.13	Sample copy of the data sheets	51
4.14	Comparative graph of vibration of concrete base and I beam	52
	base	
4.15	Comparative graph of vibration of concrete base and channel	52
	base	
4.16	Showing the measuring point 1 & 2	53
4.17	Point 1 Horizontal axis at all outlet valve settings	54
4.18	Point 2 Horizontal axis at all outlet valve settings	54
4.19	Point 1 Vertical axis at all outlet valve settings	55
4.20	Point 2 Vertical axis at all outlet valve settings	55
4.21	Point 1 Axial axis at all outlet valve settings	56
4.22	Point 2 Axial axis at all outlet valve settings	56
4.23	Gap in the RCC foundation base	57
4.24	Full support at RCC and I beam base	57
4.25	Mathematical model of motor mounted blower on RCC &	63
	steel structure	

4.26	Drawing of the channel base	65
4.27	Deflection of the channel frame Deflection 0.5 micron	65
4.28	Deflection of the I beam frame Deflection 0.9 micron	66
4.29	Deflection of the box frame Deflection 2.5 micron	66
4.30	Channel section mesh convergent	67
4.31	I beam section mesh convergent	67
5.1	Motor mounted centrifugal blower for the burners	68

Figure	Title	Page
Number		Number
5.2	Blower & motor common frame on I beam structure	69
5.3	Vibration measuring points at MNDE & MDE marked 1 & 2	69
5.4	Vibration spectrum of motor MDE bearing horizontal axis	70
5.5	Vibration spectrum of motor MDE bearing vertical axis	70
5.6	Vibration spectrum of motor MDE bearing axial axis	71
5.7	Vibration spectrum of MDE bearing at horizontal axis	71
5.8	Vibration spectrum of MDE bearing at vertical axis	71
5.9	Vibration spectrum of MDE bearing at axial axis	72
5.10	The I beams were simply replaced by the channel section	74
5.11	Comparison of the vibration readings of I base & channel base	75
	shown graphically	
5.12	Vibration spectrum MNDE bearing horizontal axis	76
5.13	Vibration spectrum MNDE bearing vertical axis	76
5.14	Vibration spectrum MNDE bearing axial axis	76
5.15	Vibration spectrum of MDE bearing horizontal axis	77
5.16	Vibration spectrum of MDE bearing vertical axis	77
5.17	Vibration spectrum of MDE bearing axial axis	77
5.18	Position in the blower drive end bearing for phase analysis	79
5.19	Phase analysis shows phase difference of 105 <sup>0</sup> which indicates	80
	unbalance	
5.20	The print outs of the balance mass and phase angle are shown	80
5.21	Picture of the impeller showing the trial mass and trim mass	81
3.21	welding spot	
6.1	Standard ISMC frame to make to suit the common base of the	83
	motor mounted blower	
6.2	Specify the height that the base frame should match	84
6.3	Mathematical model with 2 DOF	84