"CFD ANALYSIS AND DESIGN OF TALL CHIMNEY FOR THERMAL POWER PLANT"

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I, **Karan Dhall**, Roll No. 2K11/STE/23, a student of M. Tech. (Structural Engineering), hereby declare that the dissertation titled "**CFD Analysis and Design of tall chimney for thermal power plant**" is a bonafide record of the work carried out by me under the supervision of**Shri. G.P Awadhiya, Associate Professor** of Civil Engineering Department, Delhi Technological University inpartial fulfillment of the requirement for the award of the degree of Master of Technology and has not been submitted elsewhere for the award of any other Degree or diploma.

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ABSTRACT

This thesis presents the Study of along and across wind effects on150m high single flue RCC chimney for Shirpur TPS at Nardana, Maharastra, India where the Basic Wind speed is taken from Figure 1 of IS 875 Part 3 which is 39m/s. The analysis is carried out using STAAD PRO &MS excel spread sheets, further an extension of this project is done using ansys where computational fluid dynamics is used for wind loading on captioned chimney.

Results are compared with Indian standard codes and CFD analysis.

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Abbreviation Notation and Nomenclature

Pz= design wind pressure obtained in accordance with IS 875 (part3):1987.

Z = height of any section of the chimney in m measured from the top of foundation.

Cd = drag coefficient of the chimney to be taken as 0.8

Dz = external diameter of ηoi = peak tip deflection due to vortex shedding in the ith mode of vibration in m

dz = external diameter of chimney.

Cl= peak oscillatory lift coefficient to be taken as 0.16

H = height of chimney in m.

Ksi = mass damping parameter for the ith mode of vibration

Sn= Strouhal number to be taken as 0.2

Øzi= mode shape function normalized with respect to the dynamic amplitude at top of the chimney in the ith mode of vibration mei = equivalent mass per unit length in kg/m in the ith mode of vibration as defined,

δs = logarithmic decrement of structural damping = 2πβ

β = structural damping as a fraction of critical damping to be taken as 0.016,

σ = mass density of air to be taken as 1.2 kg/m3,

d = effective diameter taken as average diameter over the top 1/3rd height of chimney in m.

Chapter:1 INTRODUCTION

This Thesis was primarily conceptualised to understand behaviour of tall structures to wind, in our case tall building on which we started work is a chimney 150 meter in height which makes it susceptible to wind forces, also we thought to check earthquake response of this chimney.

IS CODE 4998 is specially made to calculate Along wind and Across wind loads on chimney, but this code highly recommends wind tunnel test for such heighted chimney, thus we have visited Gas dynamics laboratory of IIT delhi, wind testing laboratory of IIT Kanpur, and IIT Roorkee., but due to non availability of these labs for our project we had adopted CFD analysis to correctly predict behaviour of structure under wind forces.

Wind is essentially the large scale movement of free air due to thermal currents. It plays an important role in design of tall structures because it exerts static and dynamic loads whose effects on a slender structure, such as a chimney are significant. The wind load exerted at any point on a chimney can be considered as the sum of quasi-static and a dynamic load component.

This project deals with the analysis of single flue RCC Chimney at Nardana,Maharastra. The main objective of the study is to estimate dynamic response and thus calculate the maximum along-wind and across-wind loads on this chimney using simplified method, Random response method, CFD analysis and earthquake effects. The tall structure which is to analysed and designed is a tall chimney which is effected by two external forces one is Wind loading and other is Earthquake vibration jerks. In case of calculating the loads, force sand moments can be evaluated by Simplified method as per AS per IS code 875,IS 4998 the calculations is done for the motive is to calculated above mentioned loads and forces acting on Along wind and Across wind. The simplified method has some limitations in which simplifies rapid and complex variations, in order to study the structure completely with random and small variations in considerations Random Response method is applied. Random response method also provides us detailed analysis which is much effective than Simplified Method for result evaluations. The basic calculations analogy is similar in which Along wind and Across wind analysis is experimented and studied.

Chapter 2: LITERATURE REVIEW

Siva Konda Reddy, V.Rohini Padmavathi, Ch. Srikanth : The main objective of this paper is to get the comparative study of along and across wind effects on a 275m high RCC twin flue chimney for two wind zones (i.e Minimum basic wind speed of 33m/s in zone I and Maximum basic wind speed of 55m/s in zone VI). The 275m chimney as shown in Fig.1 consists of a self-supporting 275m tall twin flue RCC chimney lined with mild steel and stainless steel whose unit weight is 78.5 KN/m3 . The Chimney shell is discretized into 33 segments/zones along the height for calculation purpose. STAAD.PRO is used for calculation of the Natural frequency of the chimney due to self-weight including lining. MS Excel spread sheets are generated to calculate the wind loads, shear forces and bending moments at different locations in the chimney.

Anatol Roshko 15 Nov 1960 Experiments on the flow past a circular cylinder at very high Reynolds number

M.Vignesh Kumar, N.I. Haroon Rashid, S.nadaraja pillai, K.M. Parammasivam 2012 Drag charactaristics of circular cylinder with various roughness for higher Reynolds number.

H. Vankoten Cross-Wind movements of chimneys

Menon and Rao (1997) reviews the international code procedures to evaluate the across wind response of RC chimneys. The disparities in the codal estimates of across wind moments as well as the load factor specifications are examined in this paper through reliability approach. This paper recommends that it is necessary to design for the across wind loading at certain conditions.

Chmielewski, *et. al*. (2005) studied about natural frequencies and natural modes of 250 m high multi-flue industrial RC chimney with the flexibility of soil. This paper used finite element method for analysis. Also, experimental work to investigate the free vibration response is carried out by using two geophone sensors and experimental results are compared with analytical results. The results show that the soil flexibility under the foundation influences the natural modes and natural periods of the chimney by considerable margin.

Ciesielski, *et. al*. (1996) observed cross vibration on a steel chimney arising out of aerodynamic phenomenon. This paper shows that specially designed turbulizers, mechanical dampers can reduce this cross vibrations considerably.

Ciesielski, *et. al.* (1992) gives information on vortex excitation response of towers and steel chimney due to cross wind. A model is proposed to calculate maximum displacement of the chimney at top due to cross wind and the results are reported to match closely with the observed maximum top displacement.

Flaga and Lipecki (2010) analysed the lateral response of steel and concrete chimneys of circular cross-sections due to vortex excitation. A mathematical model of vortex shedding is proposed for calculating maximum displacement of the chimney at top due to vortex shedding.

Gaczek and Kawecki (1996) explained about the cross-wind response of steel chimneys with spoilers. 3-start helical strake system with strakes of pitch 5D is explained in this paper. Also, it is reported that the top displacement of a chimney depends on the parameter of excitation.

Galemann and Ruscheweyh (1992) presented the experimental work on measurements of wind induced vibrations of a steel chimney. For the along-wind vibration, the aerodynamic admission function has been developed from the vertical coherence of the wind speed as well as from the dynamic response directly. It is shown that the interaction effect between the strouhal frequency and the natural frequency of the chimney should produce a new exciting frequency which is lower than the strouhal frequency.

Kareem and Hseih (1986) carried out the reliability analysis of concrete chimneys under wind loading. In this paper, safety criteria are taken into consideration. Excessive deflection at the top of the chimney and expedience of the ultimate moment capacity of the chimney cross-section at any level were taken as failure criterion. Formulation for wind-induced load effects, in the both along-wind and across-wind directions, is presented according to the probabilistic structural dynamics. Covariance integration method is used to formulate a special description of fluctuating wind load effects on chimneys. Load effects and structural resistance parameters are treated as random variables. These random variables are divided into three categories such as, wind environment and meteorological data, parameters reflecting wind-structure interactions and structural properties.

Ogendo, *et. al.* (1983) presented a theoretical analysis that shows that for a large class of steel chimney designs a resilient damping layer at the base can help to achieve a sufficiently high overall damping level to inhibit significant vortex-induced vibrations. Also, it is concluded from full-scale experiments that the system damping level can be increased by a factor of up to 3. Pallares, *et. al.* (2006) discusses about the seismic behaviour of an unreinforced masonry chimney. A 3D finite element non-linear analysis is carried out incorporating cracking and crushing phenomena to obtain lateral displacements, crack pattern and failure mode. Also the maximum earthquake in terms of peak ground motion that the chimney can withstand is obtained.

Verboom and Koten (2010) shows that the design rules for cross-wind vibrations for steel chimney given by DIN 4133 and CICIND model code can differ by a factor 6 or more in terms of stress. Chimneys are modelled according to the Vickery-Basu model. This paper formulates a design rule that computes more accurately the stresses in industrial chimneys due to vortex excitation. It is shown that the results obtained from this formulation gives superior results compared to the DIN 4133 or CICIND model code.

Wilson (2003) conducted experimental program to show the earthquake response of tall reinforced concrete chimney. A non-linear dynamic analysis procedure is developed to evaluate the inelastic response of tall concrete chimney subjected to earthquake excitation. Based on experiments, the results encourage reliance on the development of ductility in reinforced concrete chimneys to prevent the formation of brittle failure modes.

Kiran (2001) presented design and analysis of concrete chimney in conformity with various code such as IS 4998, ACI 307, CICIND, etc. The literature review presented above shows that there are a number of published work on steel and concrete chimneys. Experimental and theoretical studies are presented on the behaviour of tall chimneys subjected to wind and seismic force. It is found that majority of the research papers on chimney are concentrated on its response to vortex shedding. However, a very less research

effort is found on the geometric limitations of the design code with regard to steel chimneys.

Chapter 3: Behaviour of tall chimney in Wind

3.1 Along-wind effects and across-wind effects

Wind forms the biggest source of loads, in a tall freestanding structures like chimneys. The effect of wind on these tall structures can be separated into two components, known as

along-wind effect

across-wind effect

Along-wind loads are caused by ‘drag’ component of wind force on the chimney, whereas the across-wind loads are caused by the resultant ‘lift’ component. The former is accompanied by the ‘gust buffeting’ causing a dynamic response in the direction of the mean flow, whereas the second is associated with the phenomenon of ‘vortex shedding’ which causes the chimney to oscillate in the direction perpendicular to the direction of wind flow. Evaluation of wind effects therefore includes the estimation of these two types of loads.

3.1.1Along Wind Effects

Along-wind effect is due to straight buffeting action, when the wind acts on the face of a structure. For the intention of estimation of these loads the chimney is modelled as cantilever, fixed to the ground. The wind is then modelled to act on the bare face of the chimney causing principal moments in the chimney. Additional difficulties arise from the detail that the wind does not normally blow at a rigid rate. Wind generally flows as gusts. This requires that the corresponding loads, and hence the response be taken as dynamic. True evaluation of the along-wind loads involves modelling the concerned chimney as a bluff body having incident turbulent wind flow. However, the mathematical rigor involved in such an analysis is not acceptable to practicing engineers. Hence most codes use an ‘equivalent static’ procedure known as the gust factor method. This method is immensely popular and is currently specified in a number of building codes including the IS:4998 code. This process broadly involves the determining of the wind pressure that acts on the chimney due to the bearing on the face of the chimney, a static wind load. This is then amplified using the ‘gust factor’ to take care of the dynamic effects.

3.1.2Across Wind Effects

Wind loads are caused by the corresponding ‘lift’ component of the wind force on the chimney. This is associated with the phenomenon of ‘vortex shedding’ which causes the chimney to oscillate in a direction perpendicular to the direction of wind flow. The across wind reaction of a chimney occurs generally due to vortex shedding and velocity dependent forces.

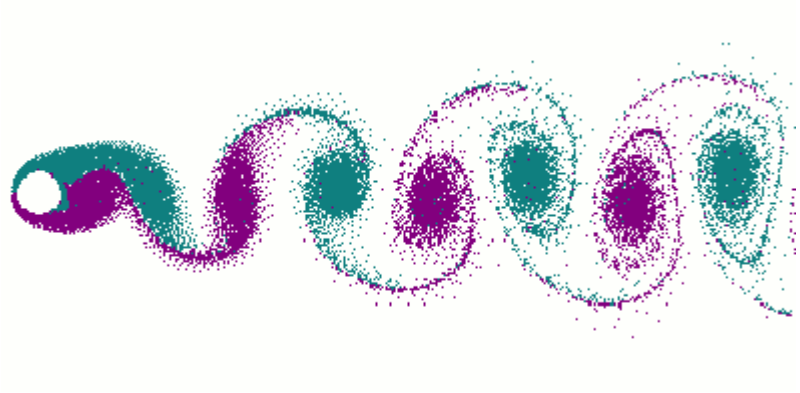


Figure 1 Vortex Shedding

The across-wind response of the tall slender structures in the atmospheric turbulence involves a number of multifaceted fluid-structure dealings phenomena. The principal cause of excitation arises from the vortex shedding, but if the gesture induced is quite significant, other velocity dependent forces begin to play ansignificant role. Further, the longitudinal and lateral fluctuations in the approaching flow give rise to across-wind buffeting forces. The shedding of the vortices is fairly regular in the sub critical range when Reynolds number (Re) $<3x10^5$ and ultra-critical range ($Re>3x10^6$), whereas it is random in super critical range ($3x10^5<Re<3x10^6$). Normally for chimneys, Re is sub critical and this allows design to be based on an assumption that the excitation is cyclic. When Re is super- critical, excitation is random and the response being small, this case does not usually control design. Across wind analysis of chimney is necessary only if the critical wind speeds for any mode of oscillation is less than the mean design wind speed**.**

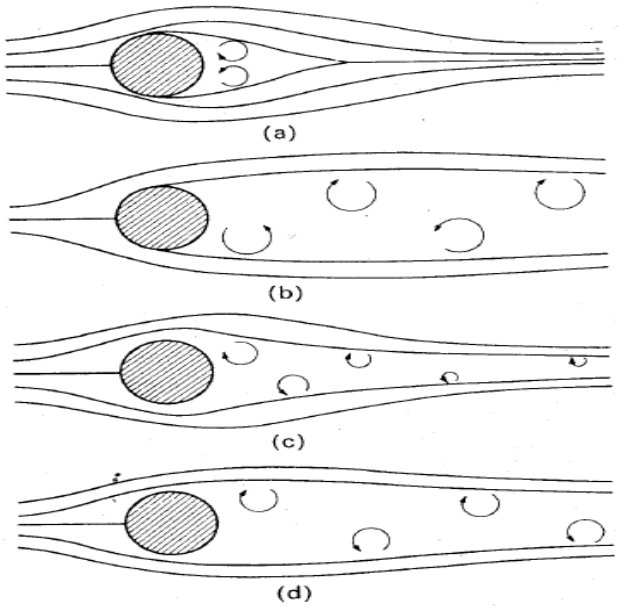
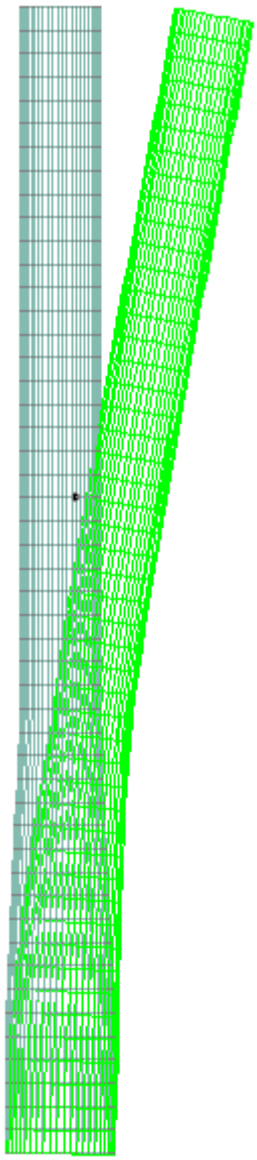
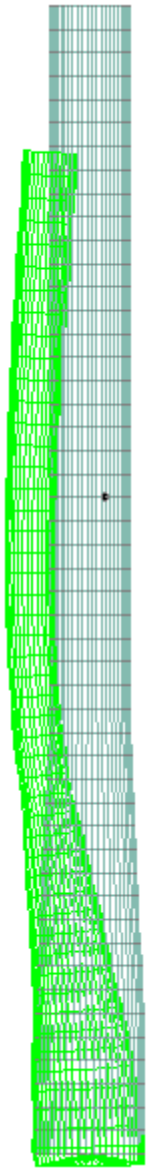


Figure 2 Showing Turbulent Wind



Along wind bending of chimney (N.T.S.)



Across wind bending of chimney (N.T.S.)

3.2 Critical wind speed

The causes of cross wind oscillation are the periodic pressure variation due to the action of vortex shedding on alternate sides of the body. Figure shows a cylinder moving at relative velocity V with respect to the fluid at a high Reynold number where the stable alternating vortex trail has developed. The cylinder is subjected to forces that swap in direction .if the cylinder is elastically kept, deflection would be seen and hence there would be deflection. The oscillation detach the vortices and the vortex shedding tends to lock into the normal frequency of vibe of cylinder and its elastic support structure.

Von Karman has shown that a train of alternate vortices forms a stable system if arranged in accordance with the expression.

$$\frac{a}{b} = \frac{1}{\pi}\cosh^{-1}\sqrt{2}$$

Experimental works shows that the width of the vortex trail a is 1.21D the spacing of the vortex is 4.3D and vortices move with a relative velocity of 0.14V.thus for circular cross section of cylinder the frequency of vortex shedding may be shown as

$$f = \frac{V - 0.14V}{4.3D} = \frac{0.2V}{D}$$

So according to IS code this is written as

$$f = \frac{SV}{D}$$

Where S isstrouhalnumber .

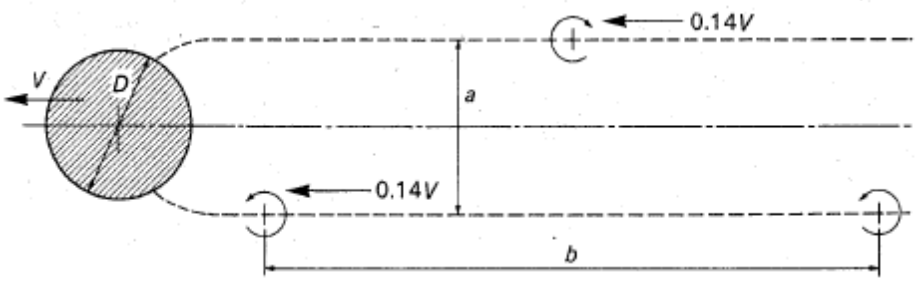


Figure 3 Isstrouhalnumber

Chapter 4: ANALYSIS AS PER INDIAN STANDARD CODES

4.1 INDIAN STANDARD CODE 875 PART iii

4.1.1 BASIC WIND SPEED

Figure 4 gives basic wind speed map of India, as applicable to 10 m height above mean ground level for different zones of the country. Basic wind speed is based on peak gust velocity averaged over a short time interval of about 3 seconds and corresponds to mean heights above ground level in an open terrain (Category 2). Basic wind speeds presented in Fig. 4 have been worked out for a 50 year return period. Basic wind speed for some important cities/towns is also given in Appendix A.

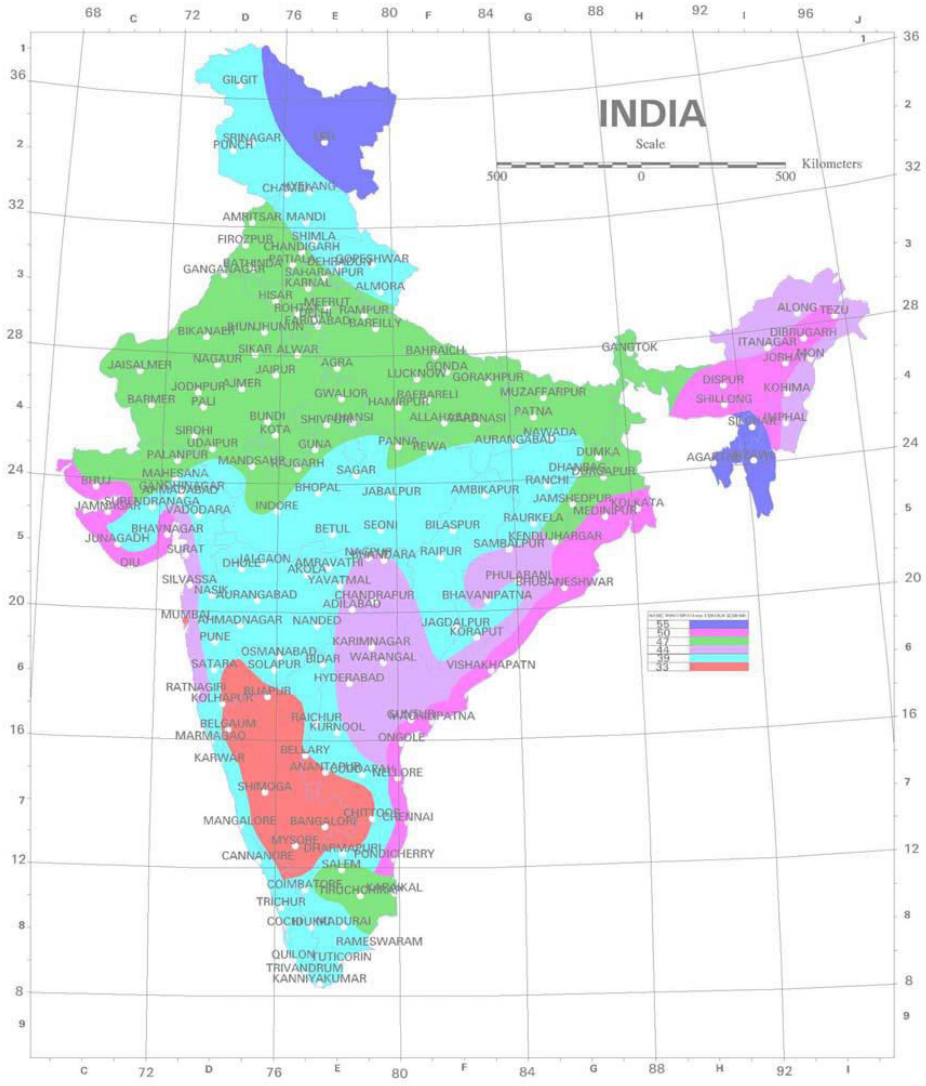


Figure 4 Wind Speed Map

4.1.2 Design Wind Speed (Vz)

The basic wind speed for any site shall be obtained from Fig. 1 and shall be modified to include the following effects to get design wind velocity at any height (for the chosen structure):

$$V_z = V_b k_1 k_2 k_3$$

Vz= design wind speed at any height z in m/s;

k1= probability factor (risk coefficient) (see 5.3.1);

k2 = terrain, height and structure size factor, it is calculated for different heights (see 5.3.2);

k3 = topography factor (see 5.3.3)

4.1.3 Design Wind Pressure

Design Wind Pressure - The design wind pressure at any height above mean ground level shall be obtained by the following relationship between wind pressure and wind velocity:

$$p_z = 0.6 V_z^2$$

where

p_z = design wind pressure in N/m^2 at height z, and

V_z = design wind velocity in m/s at height z.

4.2 Analysis based upon IS 4998

4.2.1 Circumferential Wind Moments

The circumferential ring moments due to wind

are calculated by the formula:

Moe or *Moi* = **0.33** pz. r^2 in N-m/m height

4.2.2 Along wind load –Simplified method

Static wind pressure Pz, acting normal to the surface of chimney should be taken as specified in IS 875 (Part 3): 1987 for the suitable wind zone, terrain and topography. To conclude the wind force acting at different heights of chimney, the chimney shall be separated into ten or more sections along its elevation.

The along wind load or drag force per unit height of the chimney at any level shall be calculated from the equation as per Clause No A-4.1 of IS 4998 (Part 1):1992.

$$Fz, = PzC_Ddz$$

Where

Pz = design wind pressure obtained in accordance with IS 875 (part3):1987.

Z = height of any section of the chimney in m measured from the top of foundation.

CD = drag coefficient of the chimney to be taken as 0.8

d z = external diameter of chimney.

NOTE — Take the appropriate factor depending upon the class of the structure as defined in the IS 875 (part3):1987.

The wind load on an isolated chimney in the direction of wind at any height may be approximated by multiplying the design wind pressure at that height by the drag coefficient CD and diameter. The result will give the wind load per unit height. When a bunch of chimneys is present, aerodynamic intervention between them may increase the total wind load. Aero-dynamic interference shall be considered for along-wind load only if the spacing among the centre lines of the chimneys is less than 3 times the effective diameter of the largest chimney. The improvement in wind loads will be due to an increase in the value of CD. The value of CD for each chimney located within a distance of 3 times the effective diameter, may be calculated by supercilious the value of CD to be increasing linearly from 0.8 (for a spacing of 3 effective diameters) to a value of 2.0 (for a hypothetical spacing of 1 effective diameter which implies that the two chimneys touch each other if they are cylindrical and identical). These values of CD apply up to the height of the nearest interfering chimney, if the chimneys are of uneven height. It is permissible to obtain more accurate values of CD by carrying out properly conducted model tests in wind tunnels.

4.2.3Across wind load Simplified method:

Consider the motion of the chimney

$$y(x) = y_0(x)cos\omega t$$

Where y(x) is the instantaneous deflection at distance x along the shaft at time t, and y (x) is the maximum deflection at point x. At the critical wind speed when the motion has approached equilibrium, the energy input per cycle due to the vortex shedding force is equal to the energy absorbed per cycle by the structural and aerodynamic damping. Now as the exciting force and the natural frequency are of the same period, the exciting force and the deflection will be out of phase by $\pi/2$. If F is the force per unit length of shaft, then

$F = \frac{1}{2}C_L\rho V_c^2 D \sin \omega t$

Where C_L is the peak coefficient of fluctuating lift and D the diameter of the shaft.

Energy input per cycle

$$= \int_0^L \int_0^\pi \tfrac{1}{2} C_L \rho V_c^2 D y_0(x) \sin \omega t \cos \omega t \,.\, dt \,.\, dx.$$

$$= \tfrac{1}{4}\pi C_L \rho V_c^2 \int_0^L D y_0(x) \,.\, dx.$$

Energy absorbed per cycle by damping

$$= \delta \int_0^L \tfrac{1}{2} m(x) \omega^2 y_0(x)^2 \,.\, dx,$$

And as these are equal,

$$\tfrac{1}{2}\pi C_L \rho V_c^2 \int_0^L D y_0(x) \,.\, dx = \delta \omega^2 \int_0^L m(x) y_0(x)^2 \,.\, dx$$

Now if the mode shape for the ith mode is calculated for unit tip deflection and this is called $\hat{\phi_i(x)}$ $(\phi_i(L) = 1)$, the actual peak deflected shape may be defined as $y_{0i}(x) = p_i \phi_i(x)$, Where p_i is a scalar multiplier for the i_{th} mode,

So that

$$\tfrac{1}{2}\pi C_L \rho V_{ci}^2 \int_0^L D \phi_i(x) \,.\, dx = \delta \omega_i^2 p_i \int_0^L m(x) \phi_i(x)^2 \,.\, dx$$

Where V_{ci} is the critical wind speed and is the angular velocity of the mode.

Thus

$$p_i = \frac{\tfrac{1}{2}\pi C_L \rho V_{ci}^2 \int_0^L D \phi_i(x) \,.\, dx}{\delta \omega_i^2 \int_0^L m(x) \phi_i(x)^2 \,.\, dx}$$

If the mode shape is known, equation 2.7 can be evaluated manually to give and hence the deflected shape and the moments, etc.

The foregoing expression is identical to that proposed by Rumman and has been used in the design of many tall chimneys. The value of C_L/δ is one of the most uncertain values and Rumman mentions values of C_L/β of between 13 and 16 which is equivalent to values of C_L/δ of 2.05 to 2.55[2.19]. This range of values corresponds to circular sections with high damping.

Where the diameter and mass distribution are nearly uniform over the height of the chimney the equivalent static load per unit length f can be calculated for the first mode of vibration using equations 2.5 and 2.7. Putting $q_c = \tfrac{1}{2}\rho V_c^2$ and taking D and $m(x)$ out of the integrals gives

$$p = \frac{\pi C_L q_c D \int_0^L \phi(x).dx}{\delta \omega^2 m \int_0^L \phi(x)^2.dx}$$

And

$$m \int_0^L u(x)dx = \frac{\omega^2 m}{g} \int_0^L u(x)^2.dx$$

Now $u(x)$ is the deflected shape under a horizontal load of mg so if $u(x) = \rho'\phi(x)$ then equation 2.9 may be rearranged as

$$p' = \frac{g \int_0^L \phi(x)dx}{\omega^2 \int_0^L \phi(x)^2 dx}.$$

Now a force f per unit length gives a deflected shape of $p.\phi(x)$ and a force mg gives a deflected shape of $p'.\phi(x)$.

Thus $$f = mg \times p.\phi(x)/p'.\phi(x)$$
$$= \pi C_L q_c D/\delta$$

or $$f = 0.5 C_L q_c D/\beta$$

$$p_1 = \frac{\pi C_L}{\omega_1^2 \delta} \frac{\rho V_{c1}^2}{2} \frac{\int_0^L D\phi_1(x).dx}{\int_0^L m(x)\phi_1(x)^2.dx}.$$

The amplitude of the vortex excited oscillation perpendicular to direction of wind for any mode of oscillation shall be calculated by the formula as per IS 4998 part 1:

$$\eta_{01} = \left\{ \frac{\int_0^H d_z \, \phi_{z1} \, d_z}{\int_0^H \phi^2_{z1} d_z} \right\} \times \frac{C_L}{4 \pi S^2_n K_{s1}}$$

Where

ηoi = peak tip deflection due to vortex shedding in the ith mode of vibration in m

d z = external diameter of chimney.

CL= peak oscillatory lift coefficient to be taken as 0.16

H = height of chimney in m.

Ksi = mass damping parameter for the ith mode of vibration

Sn= Strouhal number to be taken as 0.2

Øzi= mode shape function normalized with respect to the dynamic amplitude at top of the chimney in the ith mode of vibration

4.2.3.1 Calculations for Ø

Calculation of Ø i.e. mode shape is done numerically or by some accepted software using dynamic characteristics of building

Generally mode shapes upto 4 are sufficient to obtain results

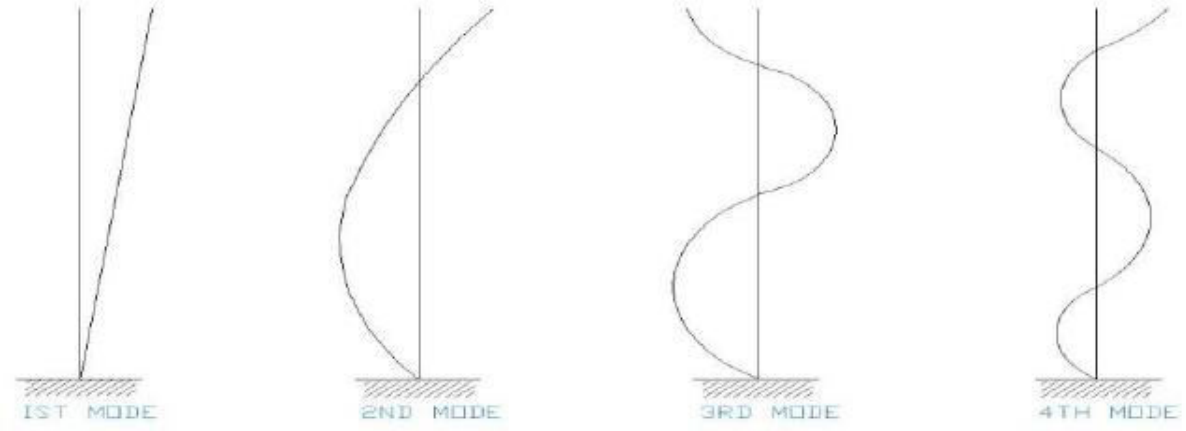


Figure 5 Showing Different mode shapes

4.2.4 Calculation of mass damping parameter (Ksi):

For a particular cross section the zones of unsteadiness is expressed as non-dimensional Damping factor$\frac{2M\delta}{\sigma d^2}$ where M is equivalent mass per unit length, defined as mass per unit length of the structure of consistent section and mass distribution having the same natural frequency and energy as the structure considered,δ is the logarithmic decrement damping factor and D is the dia of the circular section. The criteria in non-dimensional form for circular shaft are

$\frac{2M\delta}{\sigma d^2} \leq 20$ (Instability expected)

$20 < \frac{2M\delta}{\sigma d^2} \leq 25$ (Instability probable)

$25 < \frac{2M\delta}{\sigma d^2}$ (Instability unlikely)

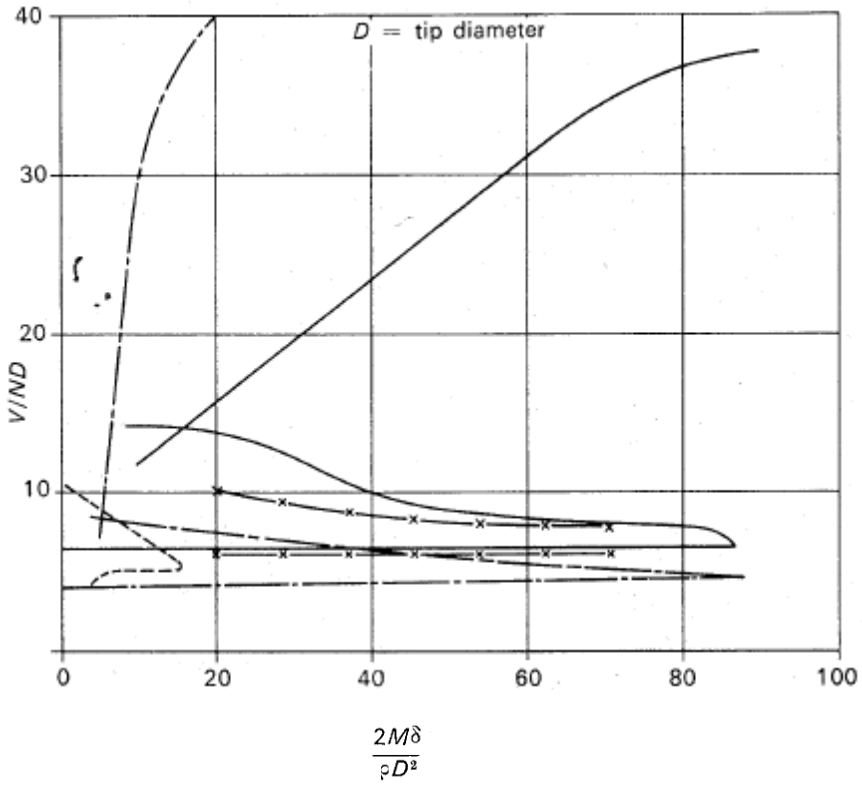


Figure 6 Curve between V/ND and non-dimensional Damping factor

——————— Square sectional model—boundary for stability

– – – – – – – – Cylinder, no taper, aspect ratio 27.5 for amplitude 0.01 × tip dia.

——— · ——— · Square sectional model—boundary of stability

×———×———× 12-sided, taper 2%, aspect ratio 11.0 on base dia. for amplitude 0.01 × tip dia.

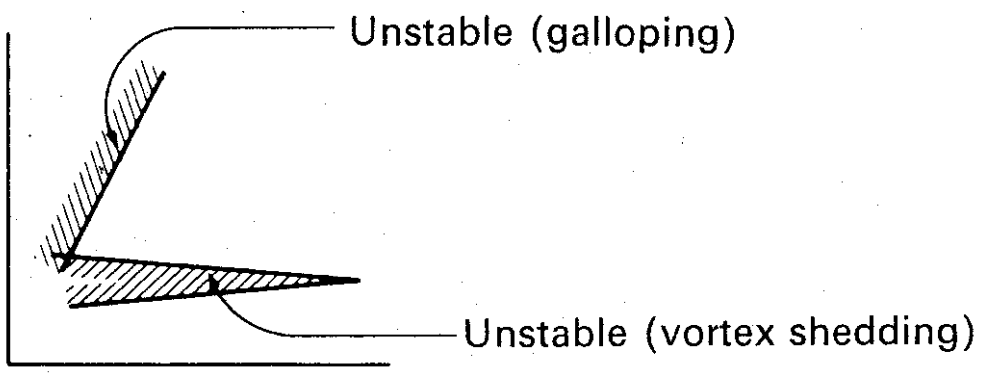


Figure 7 Galloping vs vortex shedding

Concrete structures have hysteresis and viscous dampening at large amplitude and frictional damping is

Important in the final stages of decay of free vibration. For the intention of studying the dynamic behaviour of concrete structure therefore only those damping mechanisms are considered which give rise to exponential decay in free vibration.

The motion of the viscous damped free vibrations may be expressed as

$$y = e^{-kt} \sin \omega t$$

Where k is the damping constant,ω is the angular velocity and t is the time.The term e^{-kt} is the exponential term controlling the decay of vibration and k represents the degree of dampng.

There are two common ways of defining the degree of damping the logarithmic decrement δ, or the fraction of critical damping β. the logarithmic decrement δ is the natural logarithm of the ratio of amplitude of successive cycles.δ Is given by

$$\delta = \frac{2\pi k}{\omega}$$

The fraction of critical damping β is given by decay in an angle ωt of one radian instead of in one complete cycle.so that

$$\beta = \frac{k}{\omega}$$

And hence $\delta = 2\pi\beta$

Response of chimney due to self-excited oscillation depends to a large extent on the degree of damping. Here damping is defined as the overall effect of aerodynamic action and the various form of structural damping.

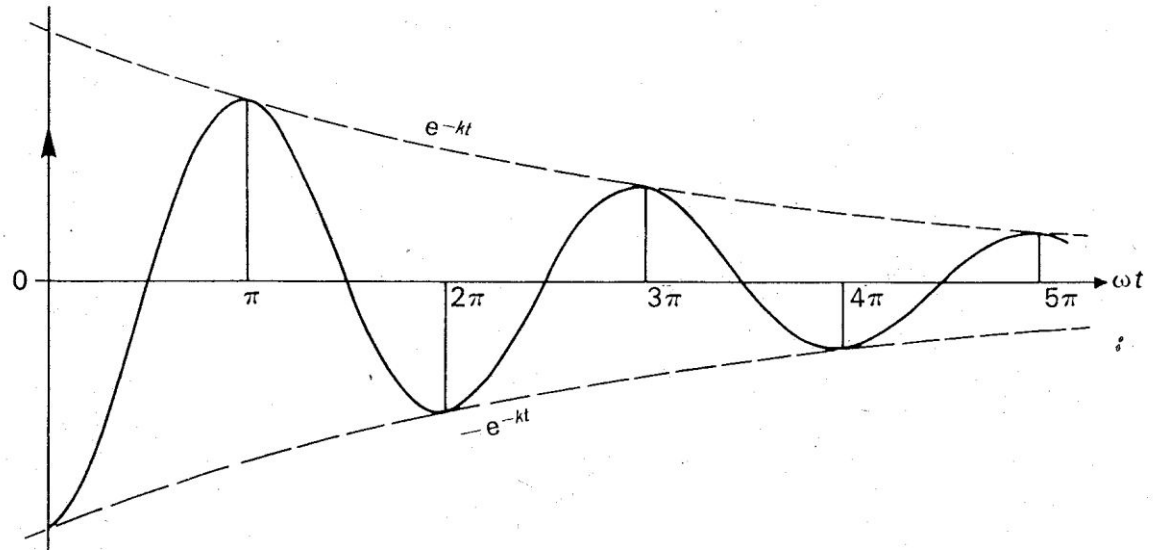


Figure 8 Damping

cyclic response of the chimney in the ith mode of vibration is very strongly dependent on dimensionless mass damping parameter Ksi calculated by the formula:

$$K_{si} = \frac{2m_{ei}\delta_s}{\sigma.d^2}$$

where

- mei = equivalent mass per unit length in kg/m in the ith mode of vibration as defined,
- δs = logarithmic decrement of structural damping = 2πβ
- β = structural damping as a fraction of critical damping to be taken as 0.016,
- σ = mass density of air to be taken as 1.2 kg/m3,
- d = effective diameter taken as average diameter over the top 1/3rd height of chimney in m.

4.2.5 Calculation of Equivalent mass per unit length (mei):

When the chimney is of consistent section the equivalent mass per unit length M is identical with the actual mass per unit length . For a tapering structure having its mass intense towards the base the equivalent mass per unit length is less than the total mass devided by total height. Conversely if a structure is a tower having a tank or viewing gallery at the top then value of M will be greater. The equivalent mass per unit length may be calculated by the formula

$$M = \frac{\int_0^L m(x)\emptyset(x)^2 dx}{\int_0^L \emptyset(x)^2 \, dx}$$

When the mass per unit length has to be used in a numerical method of integration, it is recommended that the mass of the segment above section considered be added to the mass of the segment below the section and the total mass so obtained divided by the total length of the two segments.

The recommended value of the peak oscillatory lift coefficient accounts for the Reynolds number, partial correlation of vortex shedding over the height of the chimney, effect of amplitude of oscillation and typical value of surface roughness. Calculations based on this value are acceptable for oscillatory amplitudes of up to 4 percent of the effective diameter. If the so computed value of the amplitude of oscillation ηoi exceeds 4 percent of the effective diameter, the amplitude of oscillation shall be increased as follows: Amplitude of oscillation ηoi (for computed value of ηoi> 0.04 d) = (computed value of ηoi)3/(0.4d)2.

4.2.6 Calculation of sectional shear force (Fzoi)

$$F_{zoi} = 4\,\pi^2\, f_1{}^2\, \eta_{oi} \int_{z0}^{H} m_z \phi_{zi} d_z$$

4.2.7 Calculation of Sectional Bending Moment (Mzoi)

$$M_{zoi} = 4\,\pi^2\, f_1{}^2\, \eta_{oi} \int_{z0}^{H} m_z \phi_{zi} (z - z_0) d_z .$$

where

f1 = natural frequency of the chimney in Hz in the ith mode of vibration

mz = mass per unit length of the chimney at section z in kg/m.

Load combinations to be taken in our design as per IS 4998 Part 1

a) Dead loads

b) Dead loads + wind loads

c) Circumferential effect due to wind

4.2.8 Random response method

Along wind load – (Gust factor method):

The along wind load per unit height at any height z on a chimney shall be calculated from the equation:

$$Fz = Fzm + Fzf$$

Where, Fzm is the wind load in N/m height due to

Hourly mean wind speed at height z and is given by:

$$Fzm = Pz\ CD\ d\ z$$

Fzf is the wind load in N/m height due to the

fluctuating component of wind at height z and is

given by:

$$F_{zf} = 3\ (G\text{-}1)/H^2\ (z/H) \int_0^H F_{zm}\ z\ d_z$$

The equivalent static wind loading used for design is equal to the mean wind force multiplied by the GLF. Although the traditional GLF method can ensure an accurate estimation of the displacement response, it fails to provide a reliable estimate of some other response components. In order to overcome this shortcoming, a more realistic procedure for design loads is proposed in this paper. The procedure developed herein employs a base moment GLF rather than the traditional displacement based GLF. The expected extreme base moment is computed by multiplying the mean base moment by the proposed GLF. The extreme base moment is then distributed to each floor in terms of the floor load in a format very similar to the one used to distribute the base shear in the current design practice for earthquakes.

Notwithstanding its advantages, the GLF method has some shortcomings in the following two situations. The first is in the use of this method for structures that are relatively long, tall and flexible. Although the gust factor is originally defined for any load effect, in reality, it is based on the displacement response, i.e. the gust factor is essentially the ratio between the peak and the mean displacement response and the factor is indiscriminately used for any other response. This tacitly implies that the gust factor for any structural response is the same as the displacement response factor. Because only the dynamic and mean displacement responses in the first mode are included in the derivation, the gust factor is constant for a given structure. When the constant gust factor is used to the peak equivalent wind load, an equivalent wind load whose distribution is the sameas that of the mean wind load is obtained. Obviously, this is in disagreement with the common understanding of the equivalent wind load on tall, long and flexible structures. For this kind of structures, the resonant response is dominant and the distribution of the

equivalent wind load is, therefore, a function of the mass distribution and the mode shape. In this light, it is quite reasonable to examine the equivalent wind load by the traditional GLF method to ensure that the maximum load effects established are truly representative of the actual values. Secondly, as others have noted that the GLF method is not valid if either the mean wind force or the mean response is zero. An example of this kind is a suspended bridge or a cantilever bridge with asymmetrical first mode shape. Therefore, the mean displacement response in the first mode is equal to zero whether or not the mean wind load is zero.

4.2.9 Across wind load –Random response method:

Calculation of across wind load is made by first calculating the peak response amplitude at the specified mode of vibration (usually the first or second).

$$\eta_{oi} = \frac{\frac{1.25\, C_L d \phi_{Hi}}{\pi^2 S_n^2} \times \frac{\sigma d^2 \sqrt{\{\sqrt{(\pi L)} / 2(\cap + 2)}}{m_{ei}}}{[1 / H \int_0^H \phi_{zi}^2 d_z](\beta - k_a \sigma d^2 / m_{ei}}$$

η_{oi} = peak tip deflection due to vortex shedding in the ith mode of vibration
CL = RMS lift coefficient to be taken as 0.12
L = Correlation length in diameters, which may be taken as 1.0 in the absence of field data.
Ka= Aero dynamic damping coefficient to be taken as 0.5

Calculation of shear force and Bending Moment:

$$F_{zoi} = 4\pi^2 f_1^2 \eta_{oi} \int_{zo}^{H} m_z \phi_{zi} d_z$$

$$M_{zoi} = 4\pi^2 f_1^2 \eta_{oi} \int_{zo}^{H} m_z \phi_{zi} (z - zo) d_z$$

The sectional shear force and bending moment (Mzoi) at any height z0, for the ith mode of vibration, shall be calculated from the following equations:

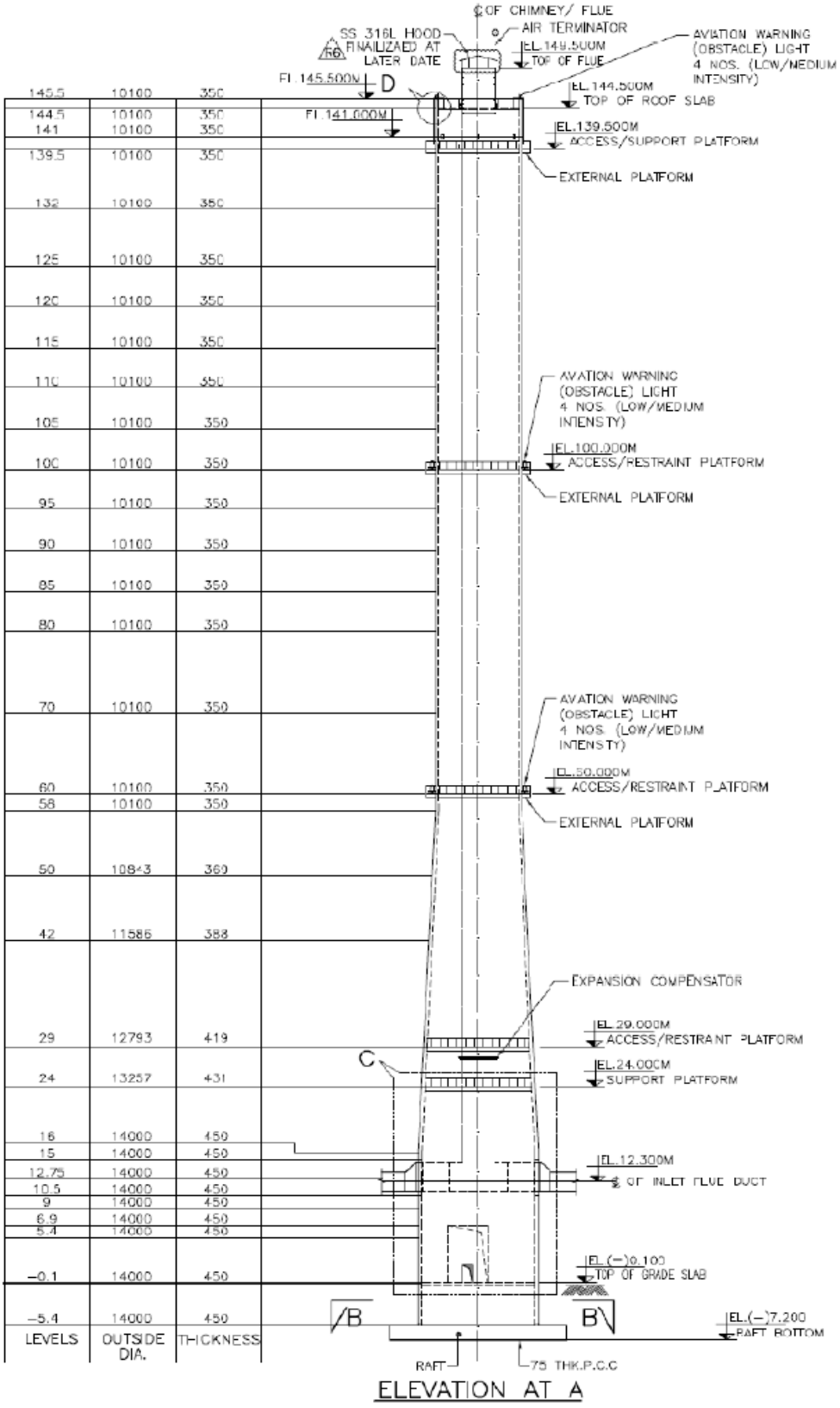


Figure 9 Chimney elevation

Chapter 5: NUMERICAL PROBLEM

5.1 Design Wind Speed

The basic wind speed(Vb), from figure 1 of IS: 875 (Part 3) – 1987, is 39m/s for Shirpur TPS at Nardana. Basic wind speed is based on peak gust velocity which is averaged over a short time interval of 3 seconds and which corresponds to mean heights 10 m over ground level in an open ground for a 50 year return period. The basic wind speed is modified in order to include the subsequent effects to get design wind velocity at a height (Vz) for the chimney structure:

- Risk level;
- topography roughness, elevation and size of structure; and
- Local geography

It can be mathematically expressed as follows:

$$Vz = Vb\ k1k2\ k3$$

Where,

Vb= basic wind speed

= 39 m/s

k1 = probability factor (risk coefficient)

= 1.06

k2 = terrain, height and structure size factor, it is calculated for different heights, as per IS 4998 Part 1 we need to consider

K3 = topography factor

= 1.0

Thus, the design windvelocity and related base shear and bending moment for along wind with simplified method.

Class A, (needs to be changed to class c)

Category 2

Height(M)	K1	K2	K3	Vb	Vz	pz(N/Sqm)
145.5	1.06	1.28	1	39	52.9152	1680.011
144.5	1.06	1.28	1	39	52.9152	1680.011
140	1.06	1.28	1	39	52.9152	1680.011
135	1.06	1.28	1	39	52.9152	1680.011
130	1.06	1.28	1	39	52.9152	1680.011
125	1.06	1.28	1	39	52.9152	1680.011
120	1.06	1.28	1	39	52.9152	1680.011
115	1.06	1.28	1	39	52.9152	1680.011
110	1.06	1.28	1	39	52.9152	1680.011
105	1.06	1.28	1	39	52.9152	1680.011
100	1.06	1.24	1	39	51.2616	1576.651
95	1.06	1.24	1	39	51.2616	1576.651
90	1.06	1.24	1	39	51.2616	1576.651
85	1.06	1.24	1	39	51.2616	1576.651
80	1.06	1.24	1	39	51.2616	1576.651
75	1.06	1.24	1	39	51.2616	1576.651
70	1.06	1.24	1	39	51.2616	1576.651
65	1.06	1.24	1	39	51.2616	1576.651
60	1.06	1.24	1	39	51.2616	1576.651
58	1.06	1.24	1	39	51.2616	1576.651
50	1.06	1.17	1	39	48.3678	1403.6664
42	1.06	1.17	1	39	48.3678	1403.6664
29	1.06	1.12	1	39	46.3008	1286.2584
24	1.06	1.12	1	39	46.3008	1286.2584
16	1.06	1.07	1	39	44.2338	1173.9774
15	1.06	1.05	1	39	43.407	1130.5006
12.75	1.06	1.05	1	39	43.407	1130.5006
10.5	1.06	1.05	1	39	43.407	1130.5006
9	1.06	1	1	39	41.34	1025.3974
6.9	1.06	1	1	39	41.34	1025.3974
5.4	1.06	1	1	39	41.34	1025.3974
0	1.06	1	1	39	41.34	1025.3974

5.2 Circumferential Wind Moments = 0.33 x pz x r^2 N-m/m(Ref. Clause 5.4 IS 4998 Part 1)

Where

Moe and Moi = internal and external ring moment

Pz = Design Wind Pressure at Z in N/sqm

rm = Mean Radius of the shell at the cross-section under consideration in M

Height	pz	r radius in m	Moe	Moi
145.5	1680	5.05	14139	14139
144.5	1680	5.05	14139	14139
140.0	1680	5.05	14139	14139
135.0	1680	5.05	14139	14139
130.0	1680	5.05	14139	14139
125.0	1680	5.05	14139	14139
120.0	1680	5.05	14139	14139
115.0	1680	5.05	14139	14139
110.0	1680	5.05	14139	14139
105.0	1680	5.05	14139	14139
100.0	1577	5.05	13269	13269
95.0	1577	5.05	13269	13269
90.0	1577	5.05	13269	13269
85.0	1577	5.05	13269	13269
80.0	1577	5.05	13269	13269
75.0	1577	5.05	13269	13269
70.0	1577	5.05	13269	13269
65.0	1577	5.05	13269	13269
60.0	1577	5.05	13269	13269
58.0	1577	5.05	13269	13269
50.0	1404	5.4215	13615	13615
42.0	1404	5.793	15545	15545
29.0	1286	6.3965	17367	17367
24.0	1286	6.6285	18650	18650
16.0	1174	7	18983	18983
15.0	1131	7	18280	18280
12.8	1131	7	18280	18280
10.5	1131	7	18280	18280
9.0	1025	7	16581	16581
6.9	1025	7	16581	16581
5.4	1025	7	16581	16581
0.0	1025	7	16581	16581

5.3 CALCULATION FOR STATIC WIND LOAD:

Along wind load –Simplified method (Peak factor method)**:**

$$Fz, = PzCD\ d\ z$$

Where

Pz= design wind pressure obtained in accordance IS 875 (part3):1987.

Z = height of section of the chimney in m measured from the top of foundation.

CD = drag coefficient of the chimney taken as 0.8&dz = external diameter of the chimney.

NOTE — Take the proper factor leading to the class ofthe structure as defined in the IS 875 (part3):1987.

Height	**pz**	**CD**	**FZ**	**DIA**	**SHEAR**	**BASE**	**Bending**
m			**N/sqm/M**	**dz**	**M-Ton**	**M-Ton**	**Mton-M**
146	1680	0.8	13574	10.1	1.36	0.00	
145	1680	0.8	13574	10.1	6.11	1.36	0.678724
140	1680	0.8	13574	10.1	6.79	7.47	22.05854
135	1680	0.8	13574	10.1	6.79	14.25	76.3565
130	1680	0.8	13574	10.1	6.79	21.04	164.5907
125	1680	0.8	13574	10.1	6.79	27.83	286.7611
120	1680	0.8	13574	10.1	6.79	34.61	442.8677
115	1680	0.8	13574	10.1	6.79	41.40	632.9106
110	1680	0.8	13574	10.1	6.79	48.19	856.8896
105	1680	0.8	13574	10.1	6.58	54.98	1114.283
100	1577	0.8	12739	10.1	6.37	61.56	1405.091
95	1577	0.8	12739	10.1	6.37	67.92	1728.79
90	1577	0.8	12739	10.1	6.37	74.29	2084.339
85	1577	0.8	12739	10.1	6.37	80.66	2471.735
80	1577	0.8	12739	10.1	6.37	87.03	2890.98
75	1577	0.8	12739	10.1	6.37	93.40	3342.073
70	1577	0.8	12739	10.1	6.37	99.77	3825.015
65	1577	0.8	12739	10.1	6.37	106.14	4339.805
60	1577	0.8	12739	10.1	2.55	112.51	4876.889
58	1577	0.8	12739	10.1	9.97	115.06	5111.88
50	1404	0.8	12176	10.843	10.07	125.03	6072.661
42	1404	0.8	13010	11.586	17.01	135.10	7140.926
29	1286	0.8	13164	12.793	6.70	152.11	8940.798
24	1286	0.8	13642	13.257	10.72	158.82	9728.16
16	1174	0.8	13149	14	1.29	169.53	11003.85
15	1131	0.8	12662	14	2.85	170.82	11174.8
13	1131	0.8	12662	14	2.85	173.67	11562.36
11	1131	0.8	12662	14	1.81	176.52	11955.16
9	1025	0.8	11484	14	2.41	178.33	12221.75
7	1025	0.8	11484	14	1.72	180.74	12598.05
5	1025	0.8	11484	14	6.20	182.47	12873.81
0	1025	0.8	11484	14		188.67	13859.13

5.4 CALCULATIONS OF DYNAMIC WIND LOADS

Across wind load –Simplified method:

$$\eta_{oi} = \left\{ \frac{\int_0^H d_z \, \phi_{zi} \, d_z}{\int_0^H \phi^2_{zi} d_z} \right\} \times \frac{C_L}{4 \, \pi S^2_n K_{si}}$$

Where

ηoi= peak tip deflection due to the vortex shedding in the ithmode of the vibration in m

dz = external diameter of chimney.

CL= peak oscillatory lift coefficient to be taken as 0.16

H = height of the chimney in m.

Ksi = mass damping parameter for the ith mode of vibration

Sn= Strouhal number to be taken as 0.2

Øzi= mode shape function normalized with respect to the dynamic amplitude at top of the chimney in the ithmode of vibration

5.4.1 Calculating Ø (mode shape)

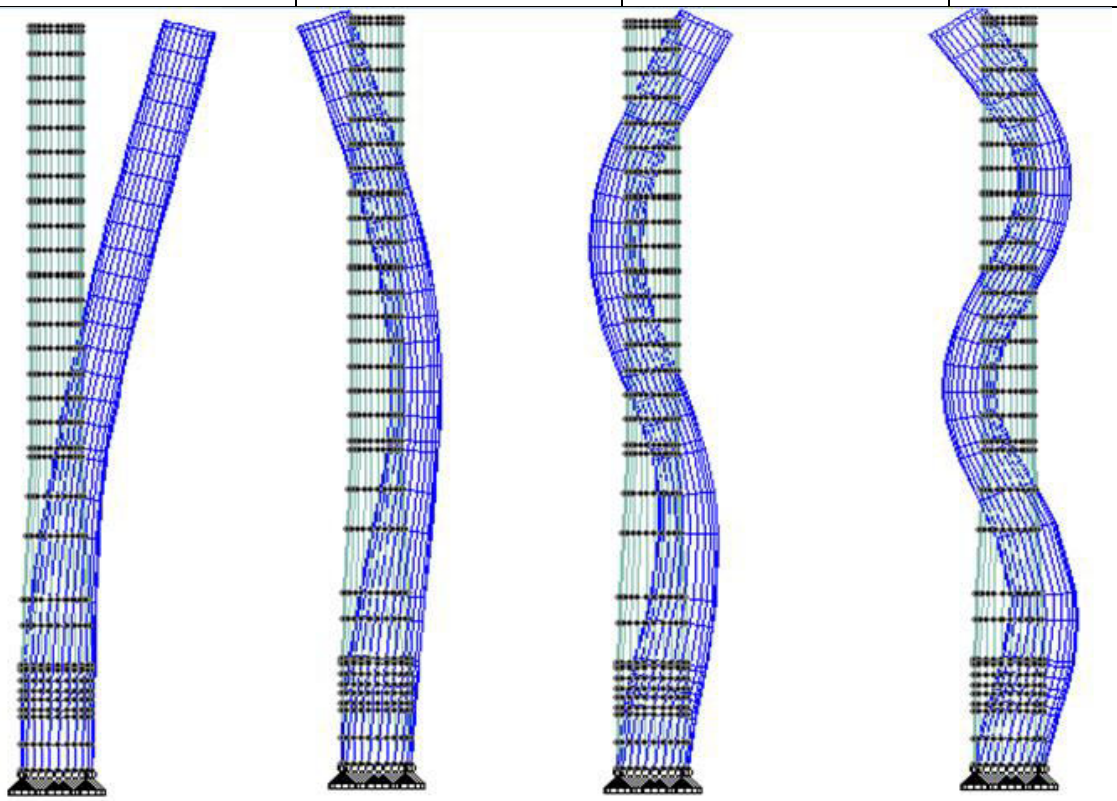
This is calculated from STAAD software using Dynamic analysis using plates in space frame for details refer appendix: A

Consolidated data for different modes

Height	Outer	Thickness	Mass	Mode	Mode	Mode	Mode 4	
M	OD	M	Kg/m	Ø1	Ø2	Ø3	Ø4	
145.5	10.1	0.35	26788.13	1	-1	1	-1	
144.5	10.1	0.35	26788.13	0.989	-0.966	0.947	-0.927	
140	10.1	0.35	26788.13	0.942	-0.813	0.711	-0.61	
135	10.1	0.35	26788.13	0.89	-0.642	0.448	-0.254	
130	10.1	0.35	26788.13	0.837	-0.472	0.19	0.081	
125	10.1	0.35	26788.13	0.785	-0.305	-0.052	0.364	
120	10.1	0.35	26788.13	0.732	-0.142	-0.268	0.569	
115	10.1	0.35	26788.13	0.68	0.014	-0.447	0.675	
110	10.1	0.35	26788.13	0.629	0.16	-0.579	0.673	
105	10.1	0.35	26788.13	0.578	0.294	-0.659	0.567	
100	10.1	0.35	26788.13	0.528	0.414	-0.683	0.375	
95	10.1	0.35	26788.13	0.48	0.518	-0.651	0.126	
90	10.1	0.35	26788.13	0.432	0.604	-0.568	-0.146	
85	10.1	0.35	26788.13	0.386	0.67	-0.439	-0.401	
80	10.1	0.35	26788.13	0.342	0.716	-0.277	-0.605	
75	10.1	0.35	26788.13	0.3	0.742	-0.094	-0.729	
70	10.1	0.35	26788.13	0.261	0.747	-0.095	-0.756	
65	10.1	0.35	26788.13	0.224	0.734	0.277	-0.684	
60	10.1	0.35	26788.13	0.19	0.702	0.438	-0.527	
58	10.1	0.35	26788.13	0.178	0.686	0.493	-0.449	
50	10.843	0.36	29624.96	0.134	0.595	0.637	-0.052	
42	11.586	0.388	34106.87	0.097	0.487	0.679	0.318	
29	12.793	0.419	40699.94	0.052	0.305	0.568	0.637	
24	13.257	0.431	43394.85	0.039	0.24	0.486	0.641	
16	14	0.45	47865.38	0.022	0.148	0.335	0.536	
15	14	0.45	47865.38	0.02	0.137	0.316	0.518	
12.75	14	0.45	47865.38	0.016	0.114	0.271	0.466	
10.5	14	0.45	47865.38	0.013	0.093	0.228	0.41	
9	14	0.45	47865.38	0.011	0.079	0.2	0.371	
6.9	14	0.45	47865.38	0.008	0.063	0.164	0.315	
5.4	14	0.45	47865.38	0.007	0.052	0.138	0.274	
-0.1	14	0.45	47865.38	0.002	0.021	0.06	0.129	
-5.5	14	0.45	47865.38	0	0	0	0	
				2.68	0.55	0.222	0.124	period sec
				2.34	11.42	28.28	50.82	ώ

Mode shapes

Mode 1	Mode 2	Mode 3	Mode 4



Shapes for different modes.

Figure 10 view showing diffrent mode shapes

Knowing the values of Ø following equation can be calculated using graphical method as specified by GeoffryM.Pinfort, Nachshen, crofts and Leggatt in book "Reinforced concrete Chimneys and towers"

5.4.2 FINDING Ksi = mass damping parameter for the ith mode of vibration

Given by

$$K_{si} = \frac{2m_{ei}\delta_s}{\sigma.d^2}$$ where

mei = equivalent mass per unit length in kg/m in the ith mode of vibration as defined,

δs = logarithmic decrement of the structural damping = 2πβ

β = structural damping as a fraction of critical damping to be taken 0.016,

σ = mass density of air to be taken 1.2 kg/m3,

d = effective diameter taken as average diameter above the top 1/3rd height of chimney in m.

= 10.1M

5.4.3 The equivalent mass per unit length in ith mode of vibration (mei):

Follwing eq is shown the ith mode of vibration

$$m_{ei} = \frac{\int_0^H m_z \phi^2_{zi} . d_z}{\int_0^H \phi^2_{zi} . d_z}$$

5.4.4 Consolidated data and corresponding results of $K_{s1}, m_{e1}, \eta_{o1}$ for first mode

Height	Outer	Thickness	Mass	Mode	mz ø1 dz	mz ø1 (z-z0)	mz	ø1^2 dz	Dz ø1 dz	ø1^2 dz
M	OD	M	Kg/m							
145.5	10.1	0.35	26788.125	1	26640.79	3876234.99	26494	0.98903	10.04445	0.98903025
144.5	10.1	0.35	26788.125	0.989	116387.7	16818023.53	112372	4.194856	43.881975	4.19485613
140	10.1	0.35	26788.125	0.942	122689.6	17176545.75	112384	4.19528	46.258	4.19528
135	10.1	0.35	26788.125	0.89	115657.7	15613793.51	99870	3.728161	43.60675	3.72816125
130	10.1	0.35	26788.125	0.837	108625.8	14121360.09	88096	3.288605	40.9555	3.288605
125	10.1	0.35	26788.125	0.785	101594	12699245.51	77059	2.876611	38.30425	2.87661125
120	10.1	0.35	26788.125	0.732	94562.08	11347449.75	66761	2.49218	35.653	2.49218
115	10.1	0.35	26788.125	0.68	87664.14	10081375.99	57376	2.141851	33.05225	2.14185125
110	10.1	0.35	26788.125	0.629	80833.17	8891648.391	48783	1.821061	30.47675	1.82106125
105	10.1	0.35	26788.125	0.578	74069.17	7777262.391	40960	1.529045	27.9265	1.529045
100	10.1	0.35	26788.125	0.528	67506.07	6750607.5	34023	1.27008	25.452	1.27008
95	10.1	0.35	26788.125	0.48	61076.92	5802307.875	27851	1.03968	23.028	1.03968
90	10.1	0.35	26788.125	0.432	54781.72	4930354.406	22406	0.836405	20.6545	0.836405
85	10.1	0.35	26788.125	0.386	48754.39	4144122.937	17747	0.66248	18.382	0.66248
80	10.1	0.35	26788.125	0.342	42994.94	3439595.25	13801	0.515205	16.2105	0.515205
75	10.1	0.35	26788.125	0.3	37570.35	2817775.898	10538	0.393401	14.16525	0.39340125
70	10.1	0.35	26788.125	0.261	32480.6	2273642.109	7877	0.294031	12.24625	0.29403125
65	10.1	0.35	26788.125	0.224	27725.71	1802171.109	5739	0.214245	10.4535	0.214245
60	10.1	0.35	26788.125	0.19	9858.03	591481.8	1814	0.067712	3.7168	0.067712
58	10.1	0.35	26788.125	0.178	35201.76	2041702.3	5215	0.194688	12.6048	0.194688
50	10.843	0.36	29624.958	0.134	29444.1	1472205.19	3162	0.106722	10.018932	0.106722
42	11.586	0.388	34106.868	0.097	36225.2	1521458.315	2461	0.072153	11.221041	0.07215325
29	12.793	0.419	40699.942	0.052	9565.782	277407.6859	421	0.010351	2.9104075	0.01035125
24	13.257	0.431	43394.847	0.039	11133.75	267209.9303	323	0.007442	3.234708	0.007442
16	14	0.45	47865.375	0.022	1005.173	16082.766	21	0.000441	0.294	0.000441
15	14	0.45	47865.375	0.02	1938.548	29078.21531	35	0.000729	0.567	0.000729
12.75	14	0.45	47865.375	0.016	1561.608	19910.50021	23	0.000473	0.45675	0.00047306
10.5	14	0.45	47865.375	0.013	861.5768	9046.555875	10	0.000216	0.252	0.000216
9	14	0.45	47865.375	0.011	954.9142	8594.228081	9	0.00019	0.2793	0.00018953
6.9	14	0.45	47865.375	0.008	538.4855	3715.549734	4	8.44E-05	0.1575	8.4375E-05
5.4	14	0.45	47865.375	0.007	1163.129	6280.894508	5	0.000109	0.3402	0.00010935
0	14	0.45	47865.375	0.002	263.2596	0	0	5.5E-06	0.077	0.0000055
-5.5	14	0.45	47865.375	0						
				∑	1441330	156627690.9	883641	32.94353	536.88186	32.9435252
							me1	**26822.91**	**ηo1**	**0.02357315**
							Ks1	**44.03434**		

5.4.5 Consolidated data and corresponding results of K_{s2}, m_{e2}, η_{o2} for second mode

Height	Outer	Thickness	Mode	mz ø2	mz ø2 (z-	mz ø2^2	ø2^2 dz	Dz ø2 dz	ø2^2 dz
M	OD	M							
145.5	10.1	0.35	-1	-26332.7	-3831411.8	25885.07	0.966289	-9.9283	0.966289
144.5	10.1	0.35	-	-107226	-15494181	95377.68	3.560446	-40.4278	3.560446
140	10.1	0.35	-	-97441.8	-13641853	70888.91	2.646281	-36.7388	2.646281
135	10.1	0.35	-	-74604.9	-10071665	41554.94	1.551245	-28.1285	1.551245
130	10.1	0.35	-	-52035.9	-6764671.3	20215.96	0.754661	-19.6193	0.754661
125	10.1	0.35	-	-29935.7	-3741966.2	6690.636	0.249761	-11.2868	0.249761
120	10.1	0.35	-	-8572.2	-1028664	548.6208	0.02048	-3.232	0.02048
115	10.1	0.35	0.014	11652.83	1340075.95	1013.797	0.037845	4.3935	0.037845
110	10.1	0.35	0.16	30404.52	3344497.41	6901.826	0.257645	11.4635	0.257645
105	10.1	0.35	0.294	47414.98	4978573.03	16784.9	0.62658	17.877	0.62658
100	10.1	0.35	0.414	62416.33	6241633.12	29086.01	1.08578	23.533	1.08578
95	10.1	0.35	0.518	75140.69	7138365.61	42153.93	1.573605	28.3305	1.573605
90	10.1	0.35	0.604	85320.18	7678816.03	54348.95	2.028845	32.1685	2.028845
85	10.1	0.35	0.67	92820.85	7889772.52	64324.85	2.401245	34.9965	2.401245
80	10.1	0.35	0.716	97642.72	7811417.25	71181.54	2.657205	36.8145	2.657205
75	10.1	0.35	0.742	99718.8	7478909.65	74240.64	2.771401	37.59725	2.771401
70	10.1	0.35	0.747	99183.03	6942812.3	73445.04	2.741701	37.39525	2.741701
65	10.1	0.35	0.734	96169.37	6251008.97	69049.61	2.57762	36.259	2.57762
60	10.1	0.35	0.702	37181.92	2230915.05	25804.25	0.963272	14.0188	0.963272
58	10.1	0.35	0.686	144530.3	8382758.48	92571.67	3.281922	51.7524	3.281922
50	10.84	0.36	0.595	137915.7	6895783.62	74612.38	2.341448	46.9285	2.341448
42	11.59	0.388	0.487	192552.7	8087214.67	76250.88	2.038608	59.64473	2.038608
29	12.79	0.419	0.305	57289.58	1661397.68	15611.41	0.371281	17.43046	0.371281
24	13.26	0.431	0.24	70817.93	1699630.38	13738.68	0.301088	20.57486	0.301088
16	14	0.45	0.148	6820.816	109133.055	971.9663	0.020306	1.995	0.020306
15	14	0.45	0.137	13515.99	202739.779	1696.256	0.035438	3.95325	0.035438
12.75	14	0.45	0.114	11146.65	142119.777	1153.678	0.024103	3.26025	0.024103
10.5	14	0.45	0.093	6174.633	64833.6504	531.0185	0.011094	1.806	0.011094
9	14	0.45	0.079	7136.727	64230.5467	506.7076	0.010586	2.0874	0.010586
6.9	14	0.45	0.063	4128.389	28485.8813	237.3823	0.004959	1.2075	0.004959
5.4	14	0.45	0.052	9434.265	50945.0332	344.3507	0.007194	2.7594	0.007194
0	14	0.45	0.021	2764.225	0	29.02437	0.000606	0.8085	0.000606
-5.5	14	0.45	0						
			∑	1103145	42141657.1	1067753	37.92054	379.6942	37.92054
						me2	**28157.63**	**ηo2**	**0.013797**
						Ks2	**46.22551**		

Calculated values for the first 2 modes we get

ηo1	ηo2
0.02357315	0.013797

Calculation of the sectional shear force (F_{zoi})&Sectional Bending Moment (M_{zoi})

$$F_{zoi} = 4\,\pi^2\, f_1{}^2\, \eta_{oi} \int_{z0}^{H} m_z \phi_{zi}\, d_z$$

$$M_{zoi} = 4\,\pi^2\, f_1{}^2\, \eta_{oi} \int_{z0}^{H} m_z \phi_{zi} (z - z_0) d_z .$$

where

f1 = natural frequency of the chimney in Hz in the ith mode of vibration

mz = mass per unit length of the chimney at section z in kg/m.

Result taken from STAAD Pro.

Mode	Frequency Hz
1	0.373
2	1.818

Critical wind speed

$$V_{cri} = \frac{f_1 d}{S_n}$$

d	avgdia of top 1/3	10.1
Sn	strouhal number	0.2
Vcr1	18.8365	
Vcr1	91.809	does not govern

Thus calculated values of the Shear force Kg&Bending Moment Kg-M at base is as follows:

Fzo1	Fzo2	Mzo1	Mzo2
186431	Doesn't govern	20259236	Doesn't govern

5.5 ALONG WIND R.R.M. ANALYSIS

The along wind load per unit height at any height z on a chimney shall be calculated from the equation: Fz = Fzm + Fzf

							Along	Wind	R.R.M				**SHEAR**	**Bending**
Height(M)	**V_{10}**	**f_1**	**S**	**E**	**B**	**r**	**Vt**	**g_r**	**G**	**∫Fzm.Z.dz**	**F_{zf}**	**Fzf+ Fzm**	**M-Ton**	**Mton-M**
145.5	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	137102	28	**13602**	0	
144.5	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	616961	123	**13698**	1	1
140	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	133	**13707**	8	22
135	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	128	**13703**	14	77
130	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	123	**13698**	21	166
125	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	119	**13693**	28	289
120	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	114	**13688**	35	447
115	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	109	**13684**	42	639
110	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	104	**13679**	49	864
105	49.92	0.37	0.3	0.09	**0.63**	0.24	1148.96	3.91	2.42	685512	100	**13674**	55	1123
100	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	88	**12827**	62	1415
95	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	83	**12823**	68	1739
90	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	79	**12818**	74	2096
85	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	75	**12814**	81	2484
80	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	70	**12810**	87	2904
75	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	66	**12805**	94	3357
70	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	62	**12801**	100	3841
65	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	643337	57	**12796**	106	4357
60	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	257335	21	**12760**	113	4896
58	48.36	0.37	0.3	0.09	**0.63**	0.24	1143.13	3.91	2.4	1029339	82	**12821**	115	5132
50	45.63	0.37	0.28	0.09	**0.63**	0.24	1131.88	3.9	2.37	1056192	70	**12246**	126	6097
42	45.63	0.37	0.28	0.09	**0.63**	0.24	1131.88	3.9	2.37	1959586	110	**13120**	136	7171
29	43.68	0.37	0.27	0.09	**0.63**	0.24	1122.92	3.9	2.34	842041	32	**13196**	154	8983
24	43.68	0.37	0.27	0.09	**0.63**	0.24	1122.92	3.9	2.34	1446767	45	**13687**	160	9776
16	41.73	0.37	0.27	0.08	**0.63**	0.24	1113.06	3.9	2.31	184080	4	**13152**	171	11063
15	40.95	0.37	0.26	0.08	**0.63**	0.24	1108.85	3.9	2.3	398841	8	**12669**	172	11235
12.75	40.95	0.37	0.26	0.08	**0.63**	0.24	1108.85	3.9	2.3	398841	6	**12668**	175	11625
10.5	40.95	0.37	0.26	0.08	**0.63**	0.24	1108.85	3.9	2.3	265894	4	**12665**	177	12019
9	39	0.37	0.25	0.08	**0.63**	0.24	1097.56	3.9	2.27	337643	4	**11488**	179	12287
6.9	39	0.37	0.25	0.08	**0.63**	0.24	1097.56	3.9	2.27	241173	2	**11487**	182	12665
5.4	39	0.37	0.25	0.08	**0.63**	0.24	1097.56	3.9	2.27	868224	6	**11490**	183	12940
0	39	0.37	0.25	0.08	**0.63**	0.24	1097.56	3.9	2.27	0	0	**11484**	**186**	**13929**
									=	**20670804**				

5.6 ACROSS WIND R.R.M. ANALYSIS

Height	**Mode 1**	β	CL	**L**	Sn	σ	∩	me1	ka	**ø1^2 dz**	**deflection**
M	**ø1**					mass density of air				**with respect to height**	**M**
145.5	1	0.016	0.12	**1**	0.2	1.2	14.40594059	26822.90553	0.5	32.94352519	0.073196556
144.5	0.989	0.016	0.12	**1**	0.2	1.2	14.30693069	26822.90553	0.5	31.95449494	0.073250134
140	0.942	0.016	0.12	**1**	0.2	1.2	13.86138614	26822.90553	0.5	27.75963881	0.073680438
135	0.89	0.016	0.12	**1**	0.2	1.2	13.36633663	26822.90553	0.5	23.56435881	0.074194765
130	0.837	0.016	0.12	**1**	0.2	1.2	12.87128713	26822.90553	0.5	19.83619756	0.074629771
125	0.785	0.016	0.12	**1**	0.2	1.2	12.37623762	26822.90553	0.5	16.54759256	0.075145234
120	0.732	0.016	0.12	**1**	0.2	1.2	11.88118812	26822.90553	0.5	13.67098131	0.075534619
115	0.68	0.016	0.12	**1**	0.2	1.2	11.38613861	26822.90553	0.5	11.17880131	0.075963401
110	0.629	0.016	0.12	**1**	0.2	1.2	10.89108911	26822.90553	0.5	9.036950063	0.076432881
105	0.578	0.016	0.12	**1**	0.2	1.2	10.3960396	26822.90553	0.5	7.215888813	0.076793022
100	0.528	0.016	0.12	**1**	0.2	1.2	9.900990099	26822.90553	0.5	5.686843813	0.077115638
95	0.48	0.016	0.12	**1**	0.2	1.2	9.405940594	26822.90553	0.5	4.416763813	0.077534526
90	0.432	0.016	0.12	**1**	0.2	1.2	8.910891089	26822.90553	0.5	3.377083813	0.077674464
85	0.386	0.016	0.12	**1**	0.2	1.2	8.415841584	26822.90553	0.5	2.540678813	0.077761758
80	0.342	0.016	0.12	**1**	0.2	1.2	7.920792079	26822.90553	0.5	1.878198813	0.077739994
75	0.3	0.016	0.12	**1**	0.2	1.2	7.425742574	26822.90553	0.5	1.362993813	0.077508464
70	0.261	0.016	0.12	**1**	0.2	1.2	6.930693069	26822.90553	0.5	0.969592563	0.077239433
65	0.224	0.016	0.12	**1**	0.2	1.2	6.435643564	26822.90553	0.5	0.675561313	0.076527319
60	0.19	0.016	0.12	**1**	0.2	1.2	5.940594059	26822.90553	0.5	0.461316313	0.07546994
58	0.178	0.016	0.12	**1**	0.2	1.2	5.742574257	26822.90553	0.5	0.393604313	0.075257235
50	0.134	0.016	0.12	**1**	0.2	1.2	4.611269944	26822.90553	0.5	0.198916313	0.083858767
42	0.097	0.016	0.12	**1**	0.2	1.2	3.625064733	26822.90553	0.5	0.092194313	0.087830751
29	0.052	0.016	0.12	**1**	0.2	1.2	2.266864692	26822.90553	0.5	0.020041063	0.097161465
24	0.039	0.016	0.12	**1**	0.2	1.2	1.810364336	26822.90553	0.5	0.009689813	0.100612033
16	0.022	0.016	0.12	**1**	0.2	1.2	1.142857143	26822.90553	0.5	0.002247813	0.10471596
15	0.02	0.016	0.12	**1**	0.2	1.2	1.071428571	26822.90553	0.5	0.001806813	0.102808572
12.75	0.016	0.016	0.12	**1**	0.2	1.2	0.910714286	26822.90553	0.5	0.001077813	0.098177894
10.5	0.013	0.016	0.12	**1**	0.2	1.2	0.75	26822.90553	0.5	0.00060475	0.096640754
9	0.011	0.016	0.12	**1**	0.2	1.2	0.642857143	26822.90553	0.5	0.00038875	0.094425433
6.9	0.008	0.016	0.12	**1**	0.2	1.2	0.492857143	26822.90553	0.5	0.000199225	0.083994889
5.4	0.007	0.016	0.12	**1**	0.2	1.2	0.385714286	26822.90553	0.5	0.00011485	0.085632706
0	0.002	0.016	0.12	**1**	0.2	1.2	0	26822.90553	0.5	5.5E-06	
-5.5	0	0.016	0.12	**1**	0.2	1.2					
										∑	32.94352519
										ηo1 (max)	**0.10471596**

5.6.1 ACROSS WIND R.R.M. ANALYSIS CONTINUED

Thus values of the Shear force Kg&Bending Moment Kg-M at base is as follows:

Fzo1	**Fzo2**	**Mzo1**	**Mzo2**
53268.48743	DOES NOT GOVERN	43560.9311	DOES NOT GOVERN

.

5.7 SEISMIC ANALYSIS

5.10.1 Horizontal Seismic Force The horizontal seismic coefficient Ah, shall be obtained using the period T, described as under.

5.10.2 When using site specific spectra, the seismic coefficient shall be calculated from the expression :

$$A_h = \frac{\left[S_a / g\right]}{(R/I)}$$

where / g = spectral acceleration coefficient calculated from the expression:

$$A_h = \frac{\left[Z/2\right]\left[S_a/g\right]}{(R/I)}$$

where

Z = Zone factor

Sa/g = Spectral acceleration coefficient

R = Response reduction factor

Table 2 Importance factor for various Industrial structures
II

Sl No.	Categories of Structures (*see* 7.1)	Importance Factor
(1)	(2)	(3)
i)	Structures in Category 1	2.00
ii)	Structures in Category 2	1.75
iii)	Structures in Category 3	1.50
iv)	Structures in Category 4	1.00
NOTE — Higher importance factor may be assigned to different structures at the discretion of the project authorities.		

The fundamental time period for stake-like structures, ‘T” is given by:

$$T = C_T \sqrt{\frac{W_t.h}{E_s.A.g}}$$

C_T = coefficient depending upon slenderness ratio.

W_T = Total weight of structure.

h = Height of structure above the base.

Table 3 Values of C_T and C_v

Sl No.	$k = h/r_c$	Coefficient, C_T	Coefficient, C_v
(1)	(2)	(3)	(4)
i)	5	14.4	1.02
ii)	10	21.2	1.12
ii)	15	29.6	1.19
iv)	20	38.4	1.25
v)	25	47.2	1.30
vi)	30	56.0	1.35
vii)	35	65.0	1.39
viii)	40	73.8	1.43
ix)	45	82.8	1.47
x)	50 or more	1.8 k	1.50

NOTE — k = slenderness ratio, and

r_c = radius of gyration of the structural shell at the base section.

Calculation for Time period:

Area	g	Es (M25)	wt	H/r	Ct	T
19.14615	9.81	32000000000	4651909	30.3	56	1.86

5.7.1 SEISMIC CALCULATIONS

Height	Outer Diameter	Thickness	Mass	Mass				time period	medium soil	Ah1	HORIZONTAL SEISMIC LOAD	BENDING MOMENT
M	OD	M	Kg/m	kg	Z	I	R		Sa/g			
145.5	10.1	0.35	26788.13	13394.06	0.24	1.75	3	1.8613	0.731	0.0511	685.0619904	99676.51961
144.5	10.1	0.35	26788.13	73667.34	0.24	1.75	3	1.8613	0.731	0.0511	3767.840947	544453.0169
140	10.1	0.35	26788.13	127243.6	0.24	1.75	3	1.8613	0.731	0.0511	6508.088909	911132.4473
135	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	924833.6871
130	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	890580.5876
125	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	856327.488
120	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	822074.3885
115	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	787821.289
110	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	753568.1895
105	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	719315.09
100	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	685061.9904
95	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	650808.8909
90	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	616555.7914
85	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	582302.6919
80	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	548049.5923
75	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	513796.4928
70	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	479543.3933
65	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	445290.2938
60	10.1	0.35	26788.13	93758.44	0.24	1.75	3	1.8613	0.731	0.0511	4795.433933	287726.036
58	10.1	0.35	26788.13	133940.6	0.24	1.75	3	1.8613	0.731	0.0511	6850.619904	397335.9545
50	10.84	0.36	29624.96	236999.7	0.24	1.75	3	1.8613	0.731	0.0511	12121.74884	606087.4419
42	11.59	0.388	34106.87	358122.1	0.24	1.75	3	1.8613	0.731	0.0511	18316.76171	769303.9917
29	12.79	0.419	40699.94	366299.5	0.24	1.75	3	1.8613	0.731	0.0511	18735.00666	543315.1931
24	13.26	0.431	43394.85	282066.5	0.24	1.75	3	1.8613	0.731	0.0511	14426.76874	346242.4497
16	14	0.45	47865.38	215394.2	0.24	1.75	3	1.8613	0.731	0.0511	11016.70018	176267.203
15	14	0.45	47865.38	77781.23	0.24	1.75	3	1.8613	0.731	0.0511	3978.252844	59673.79267
12.75	14	0.45	47865.38	107697.1	0.24	1.75	3	1.8613	0.731	0.0511	5508.350092	70231.46368
10.5	14	0.45	47865.38	89747.58	0.24	1.75	3	1.8613	0.731	0.0511	4590.291744	48198.06331
9	14	0.45	47865.38	86157.68	0.24	1.75	3	1.8613	0.731	0.0511	4406.680074	39660.12066
6.9	14	0.45	47865.38	86157.68	0.24	1.75	3	1.8613	0.731	0.0511	4406.680074	30406.09251
5.4	14	0.45	47865.38	165135.5	0.24	1.75	3	1.8613	0.731	0.0511	8446.136808	45609.13876
0	14	0.45	47865.38	129236.5	0.24	1.75	3	1.8613	0.731	0.0511	6610.020111	0
				4651909							**231319.722**	**15251248.78**
				wt							**KG**	**KG-M**
											DOSENT GOVERN	

Chapter 6: CFD ANALYSIS

Experiments vs. Simulations

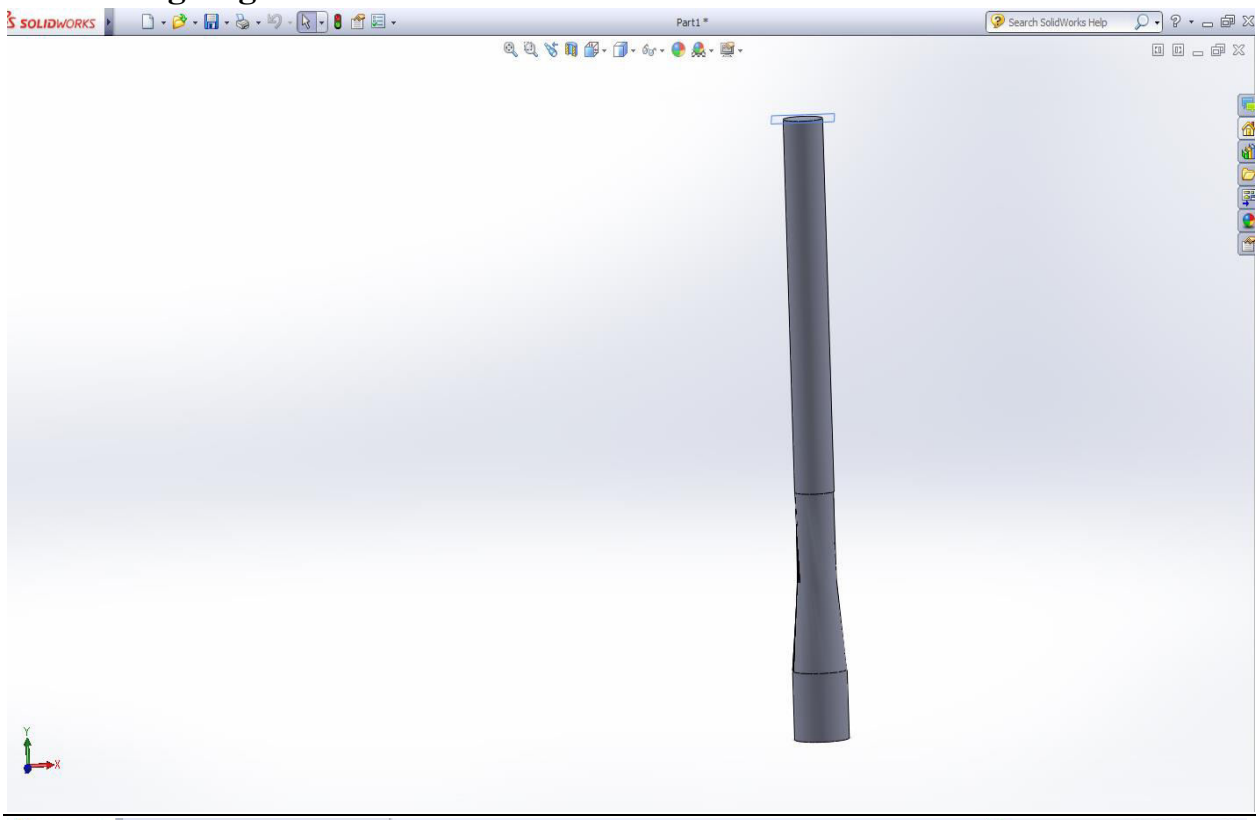
CFD gives an insight into flow patterns that are difficult, expensive or impossible to study using traditional (experimental) techniques

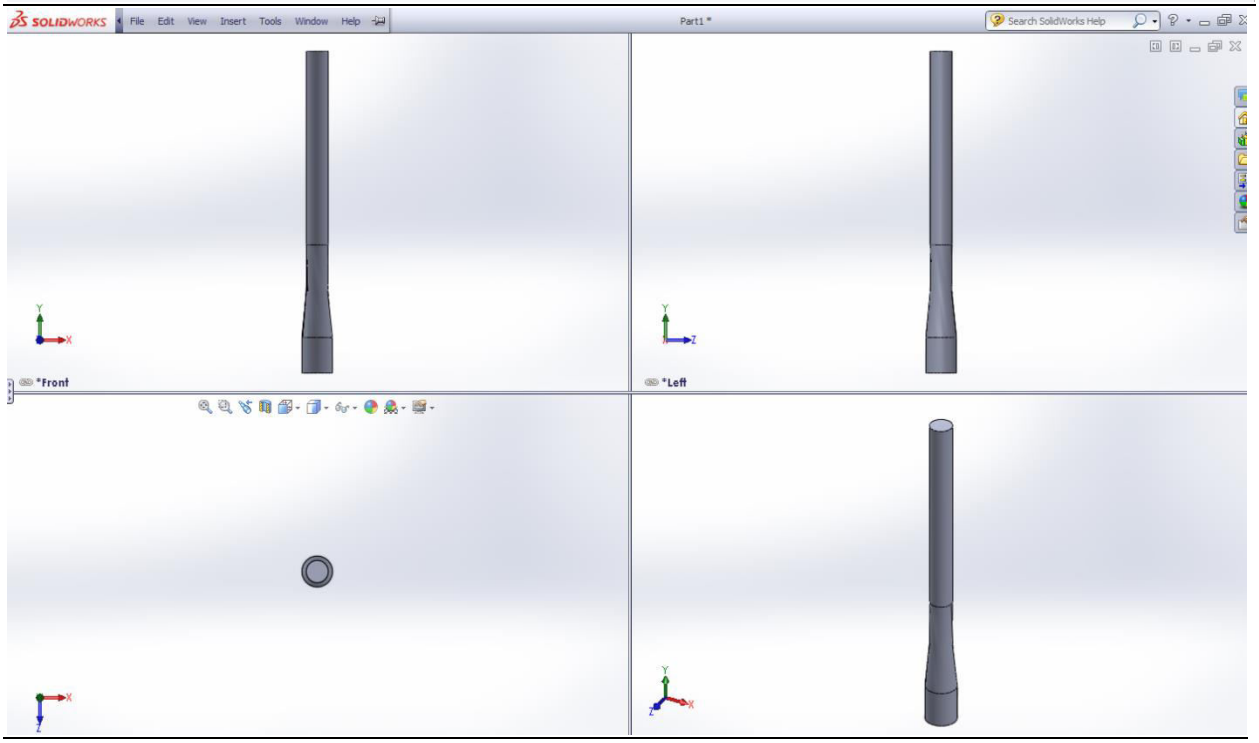
EXPERIMENTS	SIMULATIONS
Quantitative **description** of flow phenomena using measurements • for one quantity at a time • at a limited number of points and time instants • for a laboratory-scale model • for a limited range of problems and operating conditions Error sources: measurement errors, flow disturbances by the probes	Quantitative **prediction** of flow phenomena using CFD software • for all desired quantities • with high resolution in space and time • for the actual flow domain • for virtually any problem and realistic operating conditions Error sources: modeling, discretization, iteration, implementation

CFD analysis process

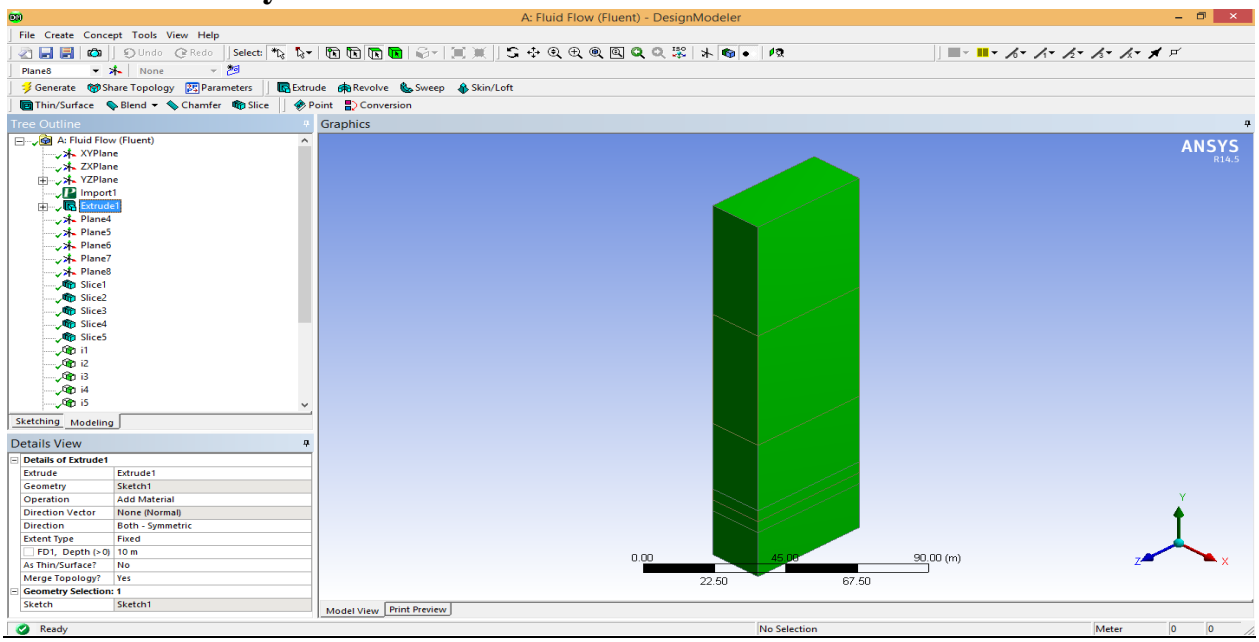
1.	**Problem statement**	information about the flow
2.	**Mathematical model**	IBVP = PDE + IC + BC
3.	**Mesh generation**	nodes/cells, time instants
4.	**Space discretization**	coupled ODE/DAE systems
5.	**Time discretization**	algebraic system $Ax = b$
6.	**Iterative solver**	discrete function values
7.	**CFD software**	implementation, debugging
8.	**Simulation run**	parameters, stopping criteria
9.	**Postprocessing**	visualization, analysis of data
10.	**Verification**	model validation / adjustment

6.1 Designing on Solid Works

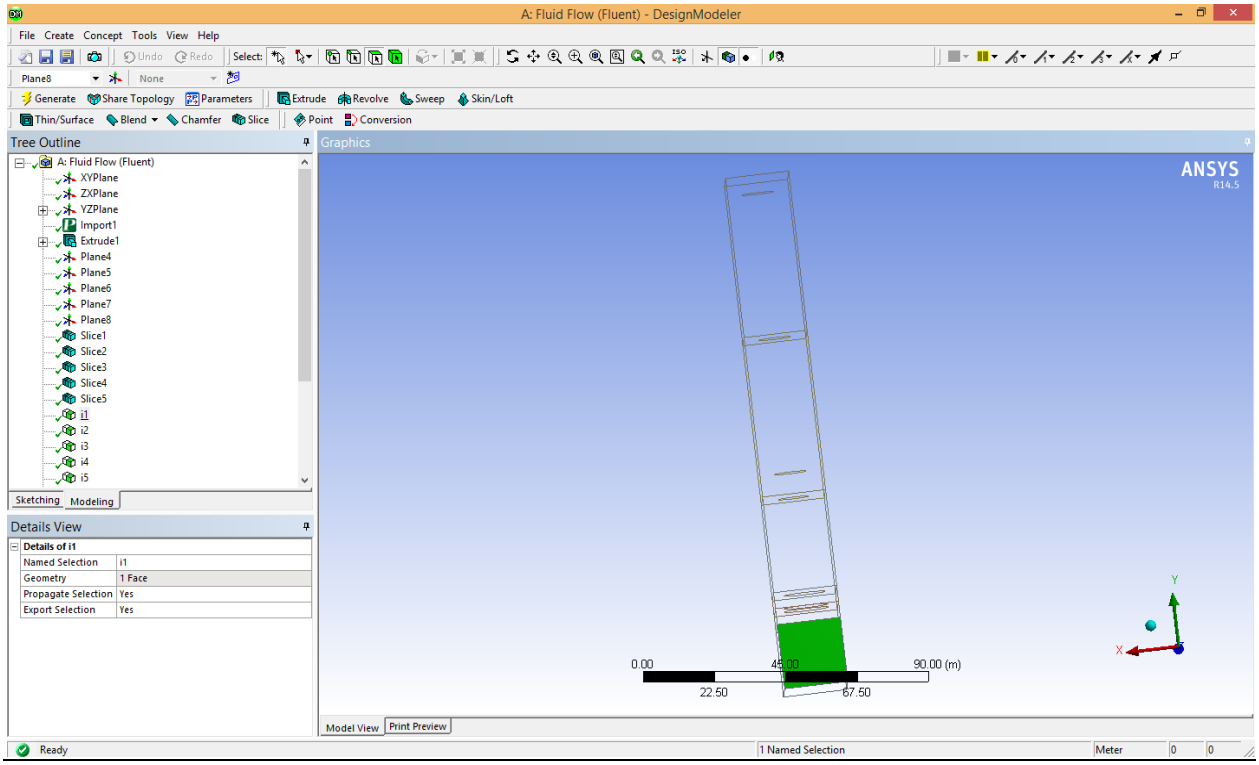




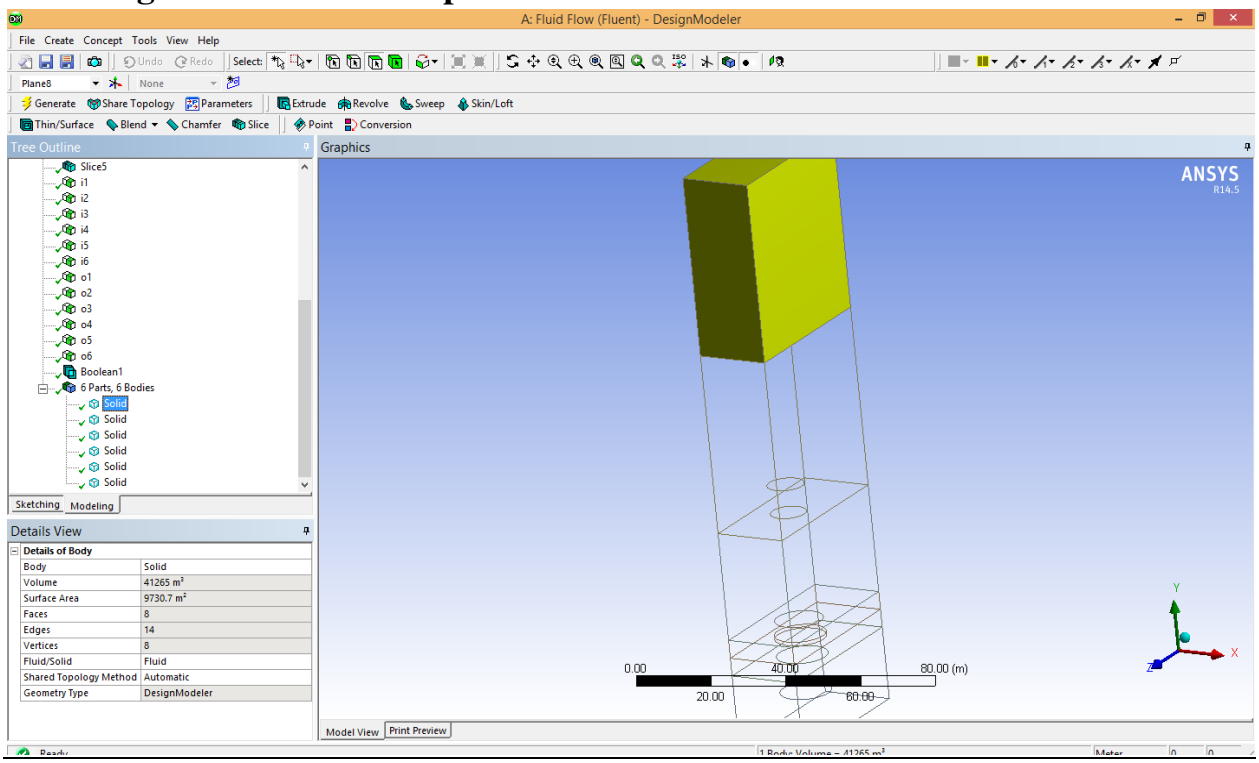
6.2 CFD analysis on ANSYS FLUENT

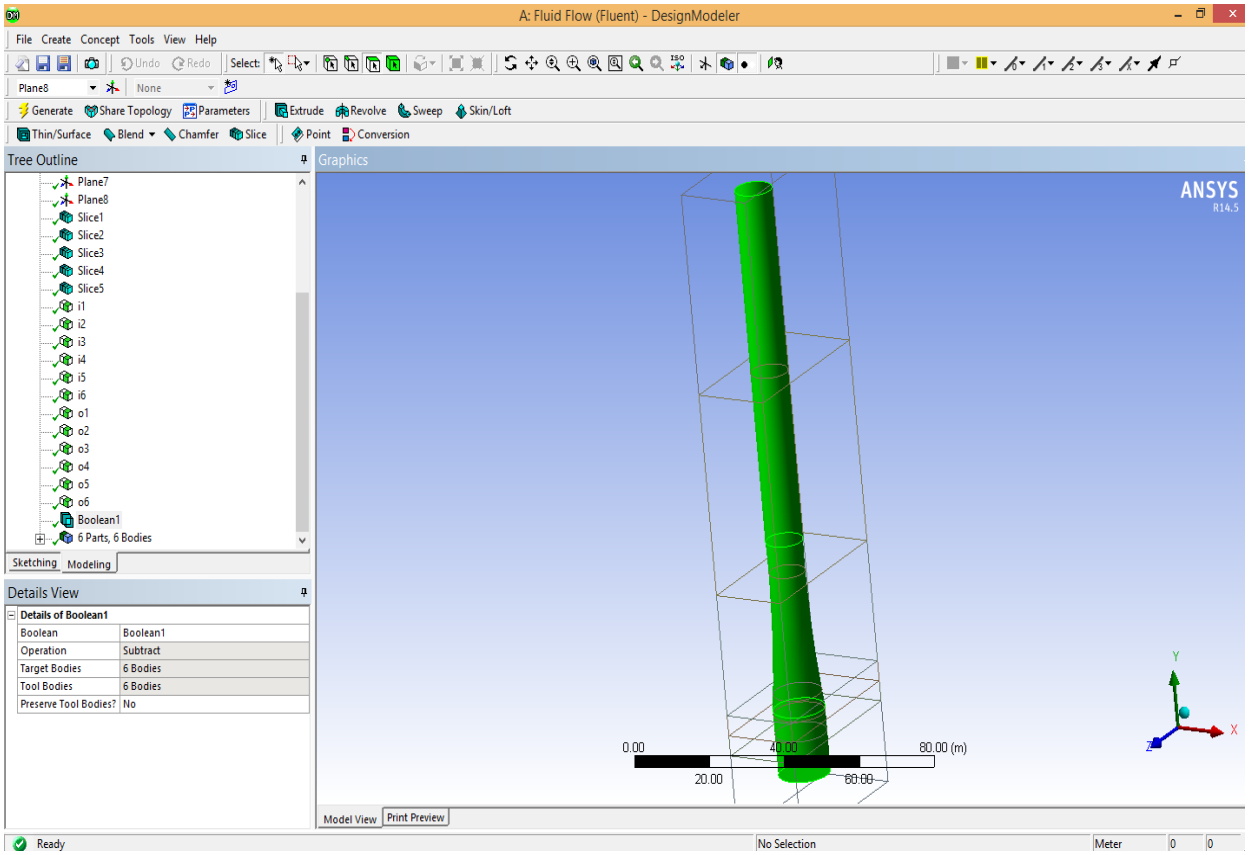


6.3 Generation of computational domain for flow analysis

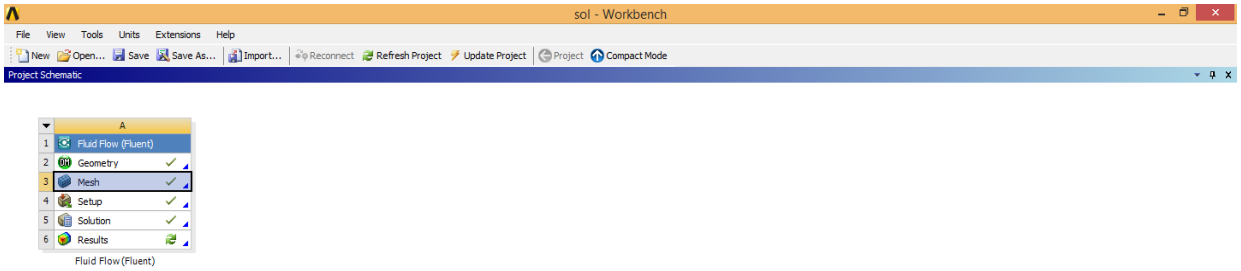


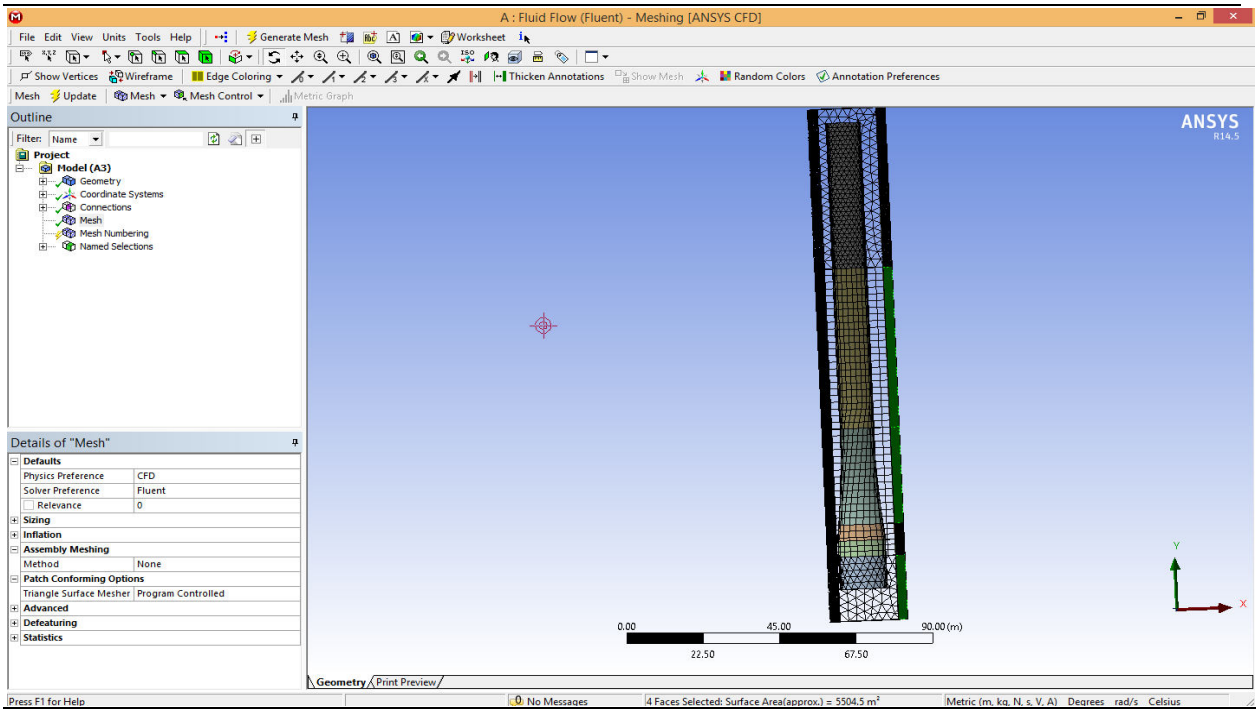
6.4 Segmentation of Computational domain



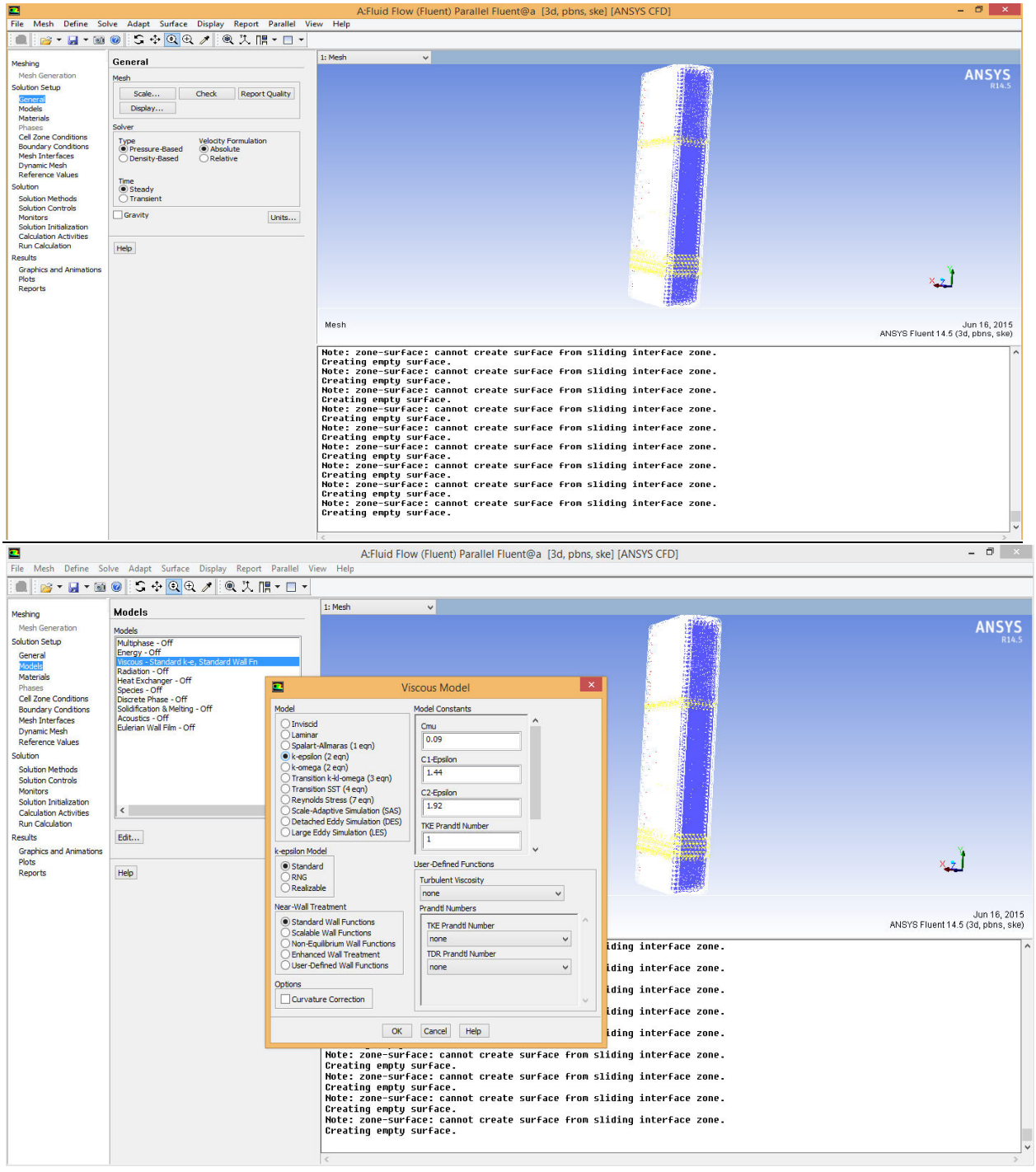


6.5 Meshing

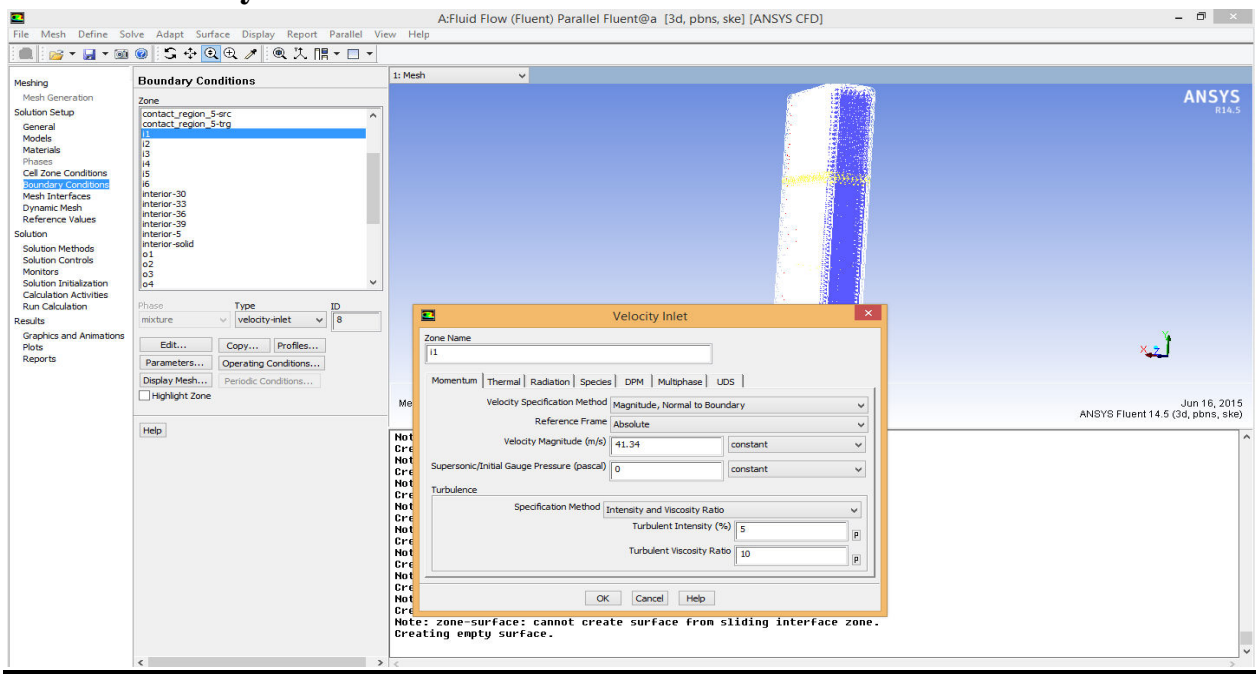

sol - Workbench
File View Tools Units Extensions Help
New Open... Save Save As... Import... Reconnect Refresh Project Update Project Project Compact Mode
Project Schematic
A
1 Fluid Flow (Fluid)
2 Geometry
3 Mesh
4 Setup
5 Solution
6 Results
Fluid Flow (Fluent)


A : Fluid Flow (Fluent) - Meshing [ANSYS CFD]
File Edit View Units Tools Help
Generate Mesh
Worksheet
Show Vertices Wireframe Edge Coloring Thicken Annotations Show Mesh Random Colors Annotation Preferences
Mesh Update Mesh Mesh Control Metric Graph
Outline
Filter: Name
Project
Model (A3)
Geometry
Coordinate Systems
Connections
Mesh
Mesh Numbering
Named Selections
Details of "Mesh"
Defaults
Physics Preference CFD
Solver Preference Fluent
Relevance 0
Sizing
Inflation
Assembly Meshing
Method None
Patch Conforming Options
Triangle Surface Mesher Program Controlled
Advanced
Defeaturing
Statistics
ANSYS
R14.5
0.00 45.00 90.00 (m)
22.50 67.50
Y
X
Geometry Print Preview
Press F1 for Help
No Messages
4 Faces Selected: Surface Area(approx.) = 5504.5 m²
Metric (m, kg, N, s, V, A) Degrees rad/s Celsius

6.6 Setup (solution generation)

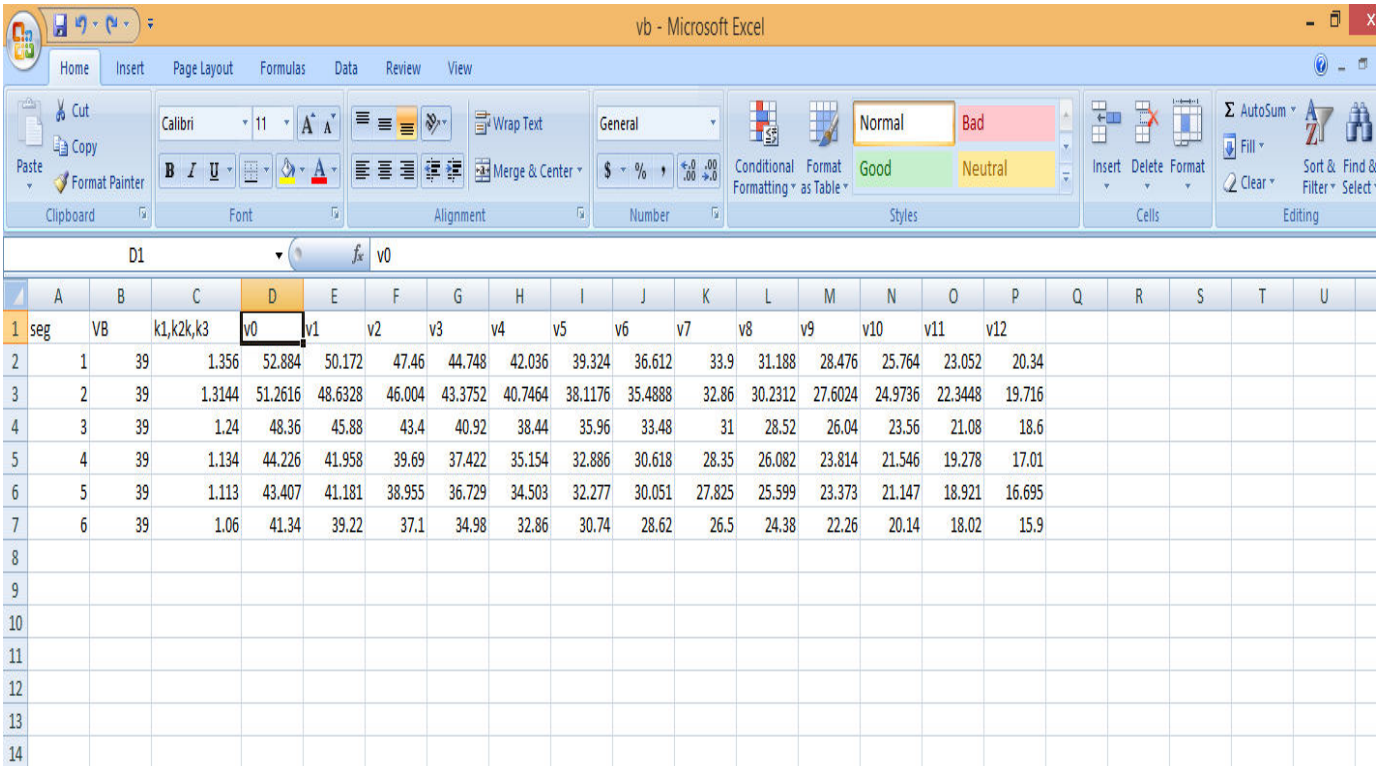


6.7 Boundary Condtions

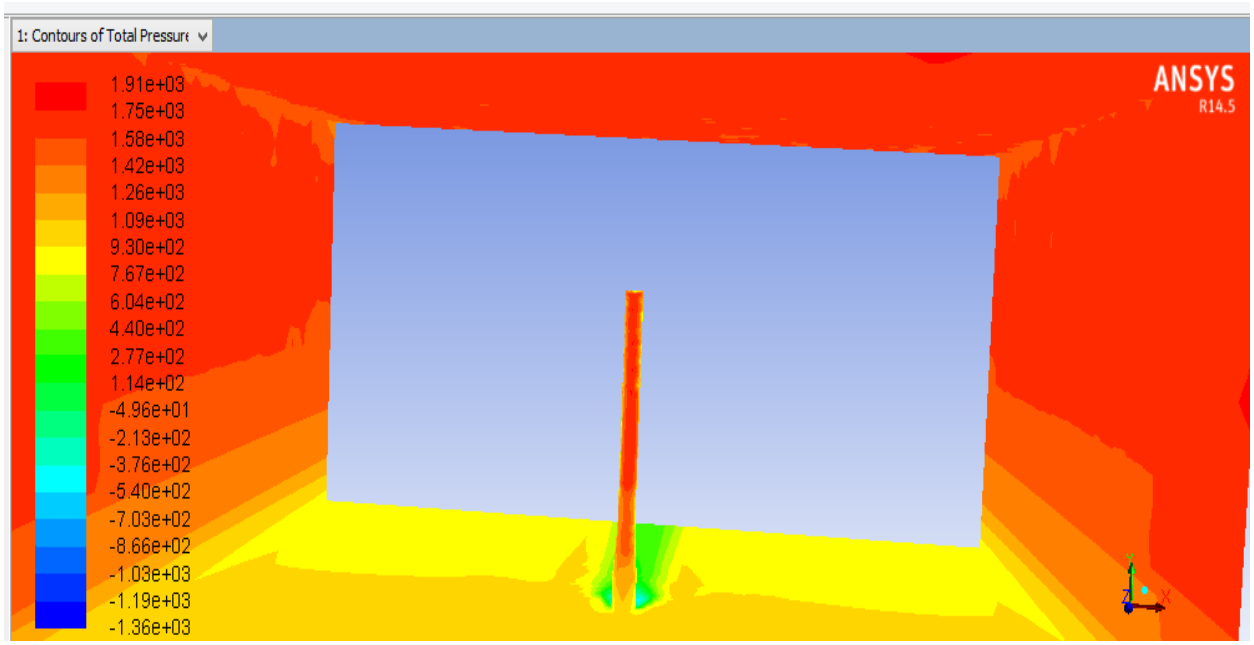


For 13 different boundary condition analysis(v0, v1, v2, v3, v4, v5, v6, v7, v8, v9, v10, v11, v12)

6.8 RESULTS (Total pressure contours and curves)



	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																
9																
10																
11																
12																
13																
14																


1: Contours of Total Pressure
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1.75e+03
1.58e+03
1.42e+03
1.26e+03
1.09e+03
9.30e+02
7.67e+02
6.04e+02
4.40e+02
2.77e+02
1.14e+02
-4.96e+01
-2.13e+02
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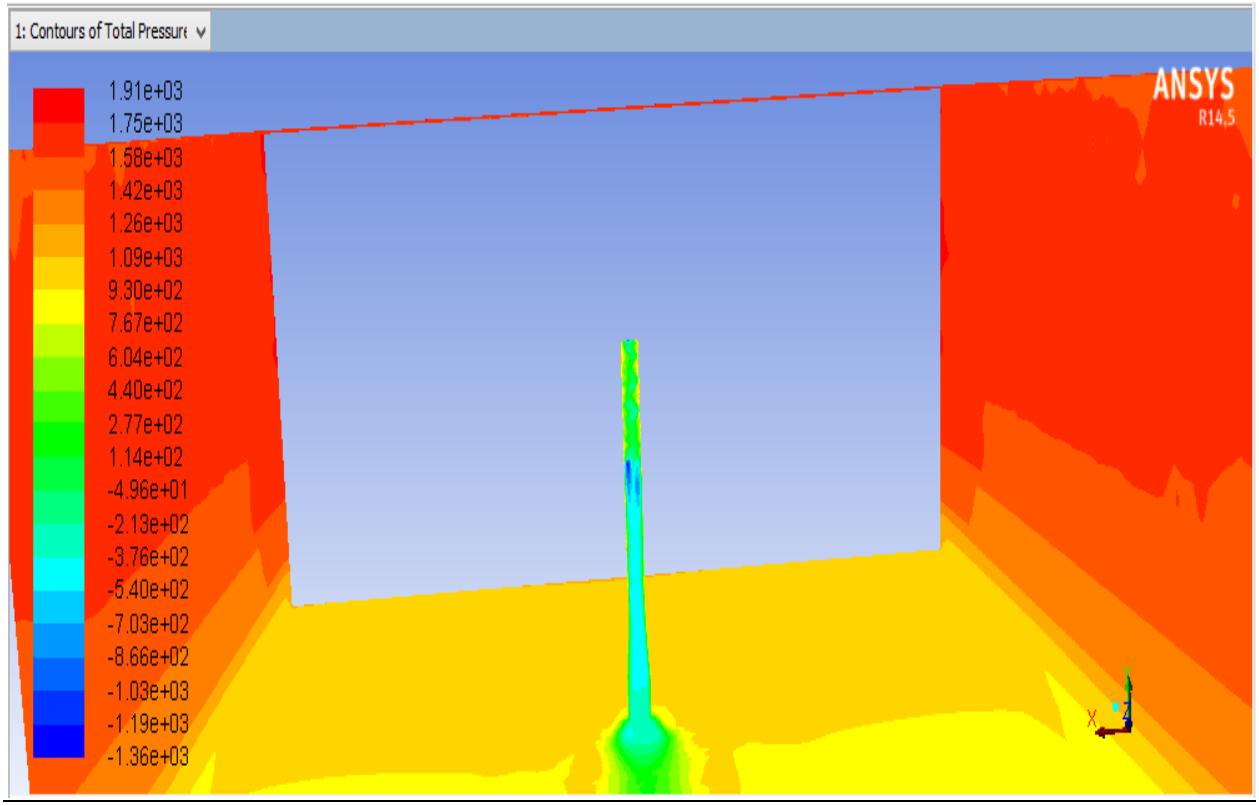
ANSYS
R14.5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1.09e+03
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7.67e+02
6.04e+02
4.40e+02
2.77e+02
1.14e+02
-4.96e+01
-2.13e+02
-3.76e+02
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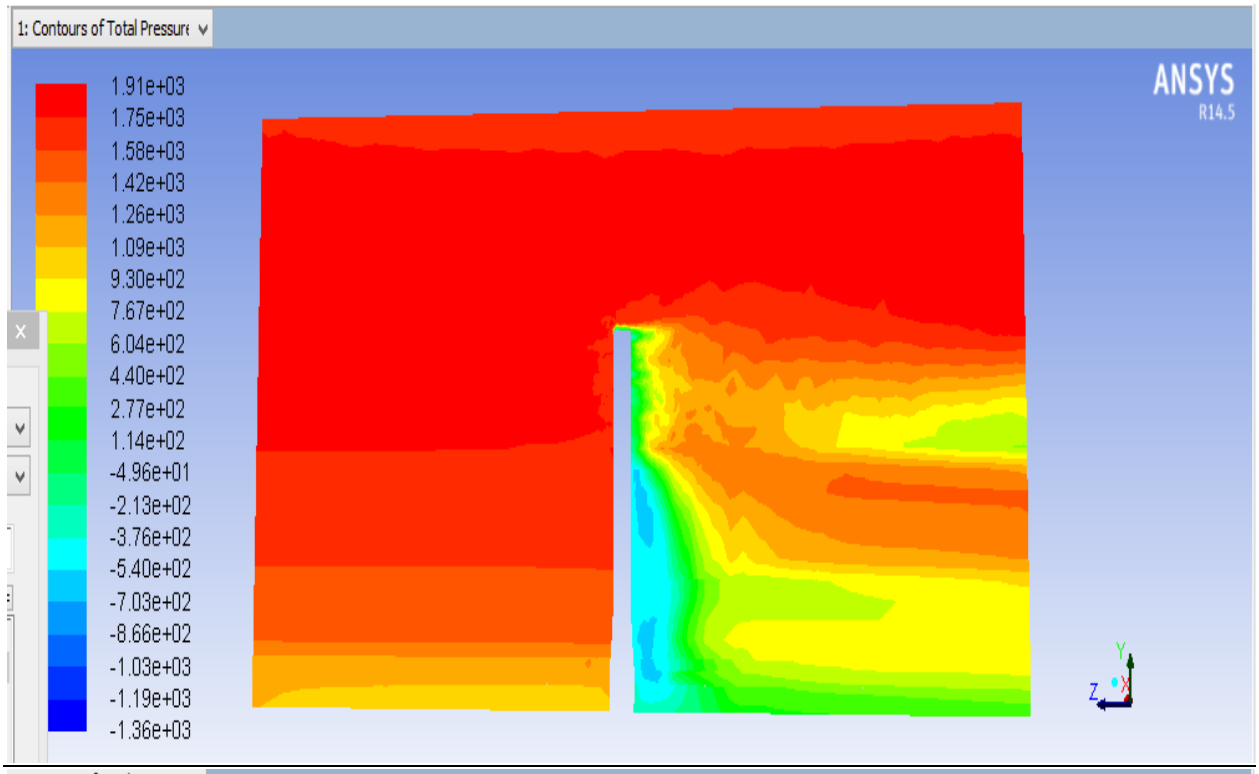
-1.19e+03
-1.36e+03
ANSYS
R14.5


1: Contours of Total Pressure
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1.42e+03
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1.09e+03
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7.67e+02
6.04e+02
4.40e+02
2.77e+02
1.14e+02
-4.96e+01
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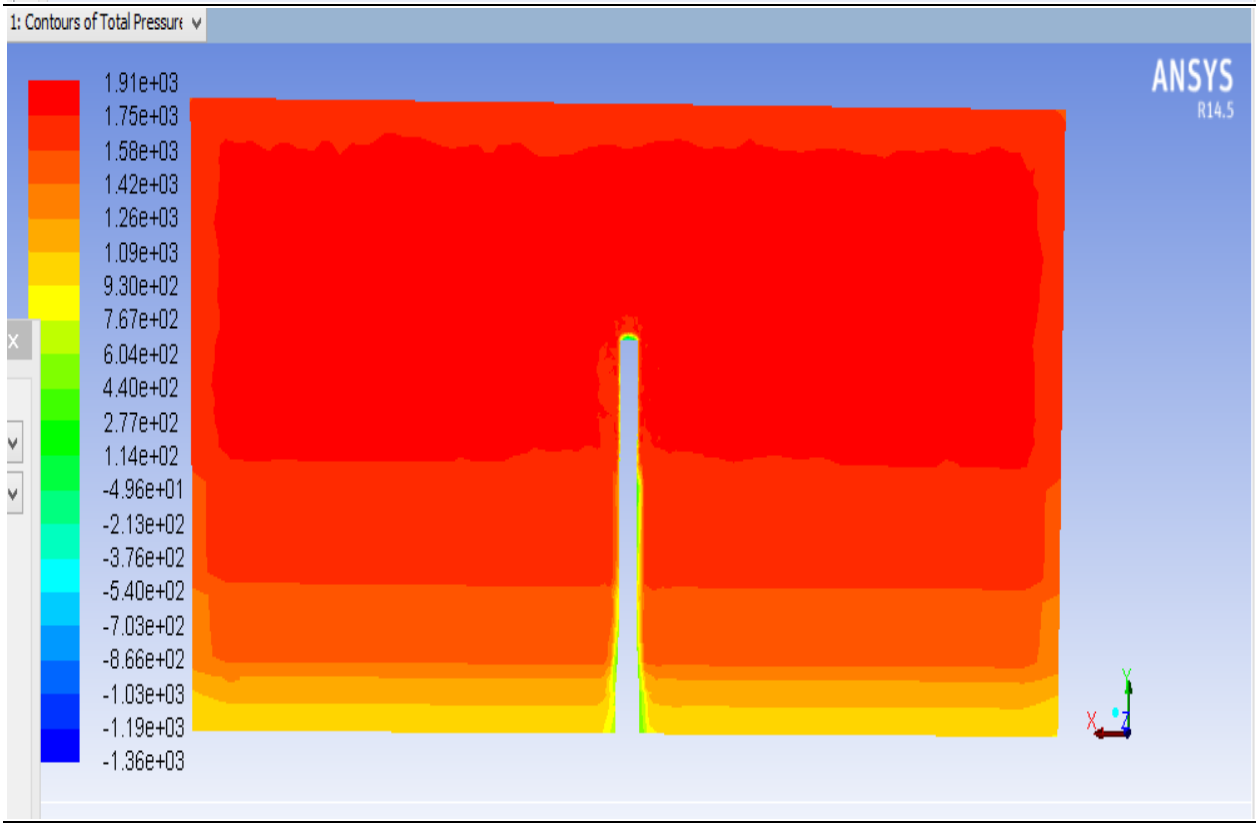
ANSYS
R14.5


1: Contours of Total Pressure
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1.58e+03
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7.67e+02
6.04e+02
4.40e+02
2.77e+02
1.14e+02
-4.96e+01
-2.13e+02
-3.76e+02
-5.40e+02
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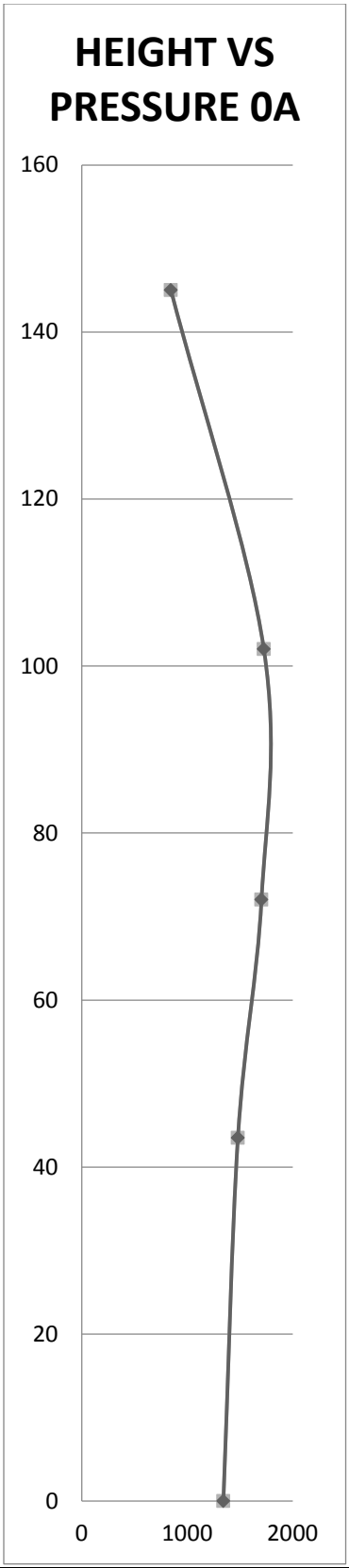
ANSYS
R14.5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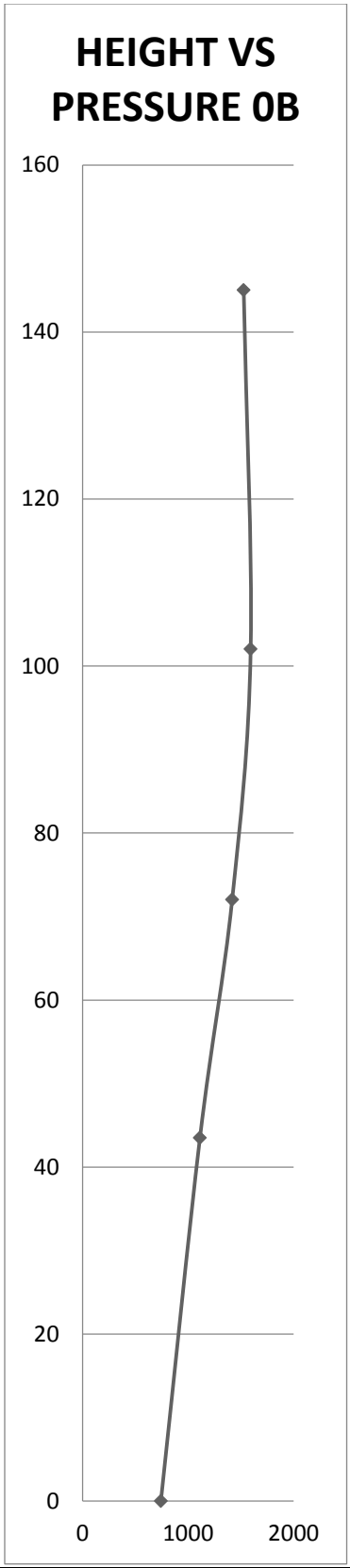
160
140
120
100
80
60
40
20
0
0
1000
2000


HEIGHT VS PRESSURE 0B
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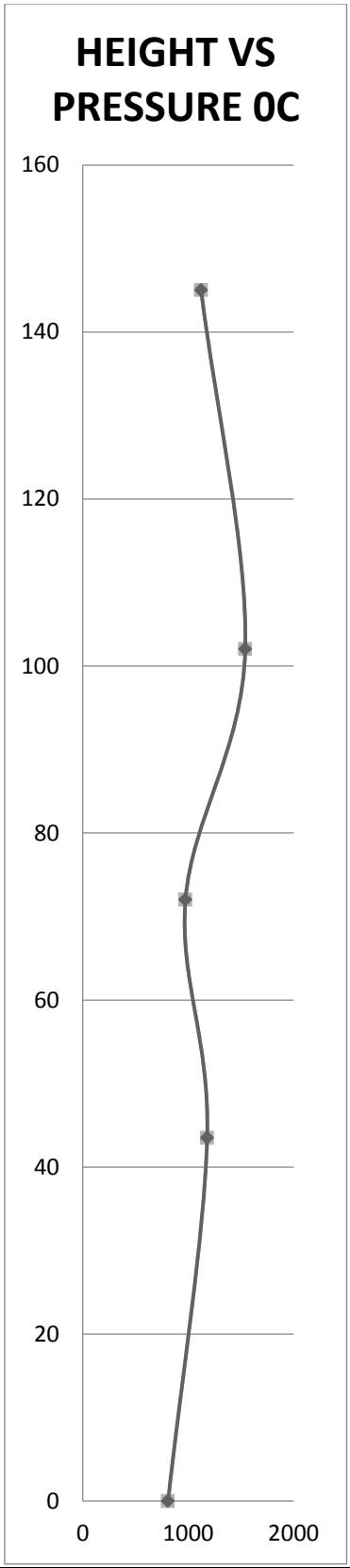
120
100
80
60
40
20
0
0
1000
2000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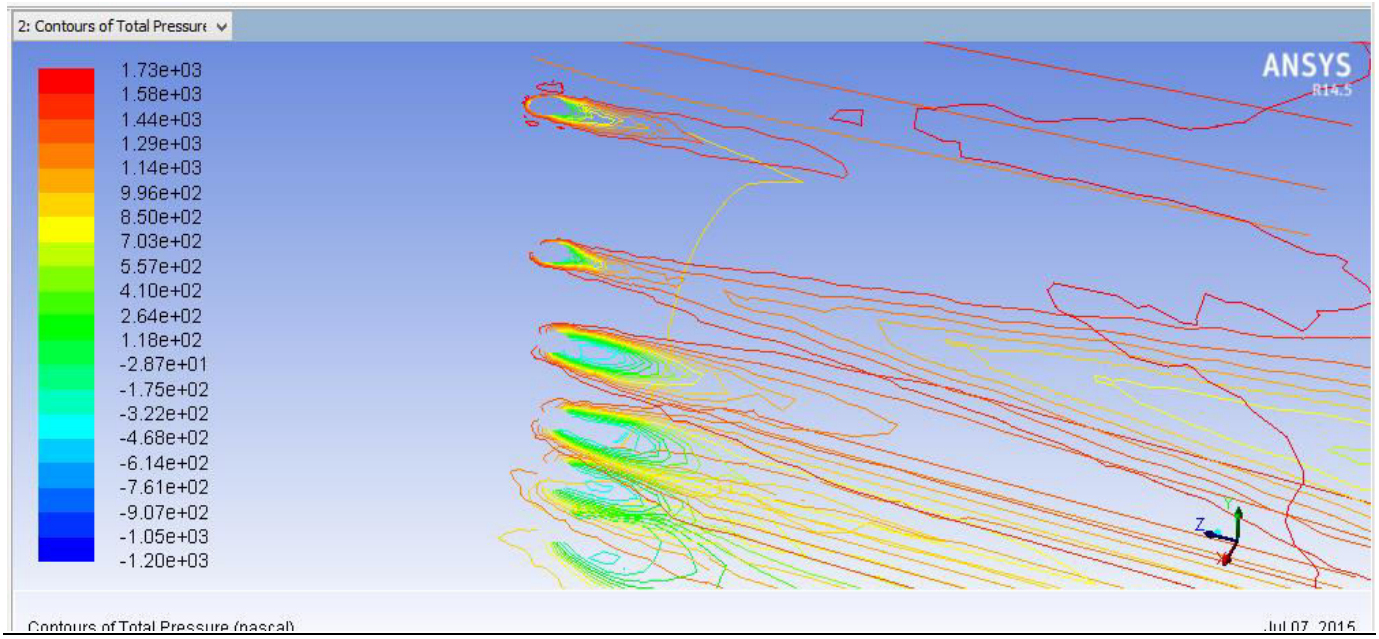
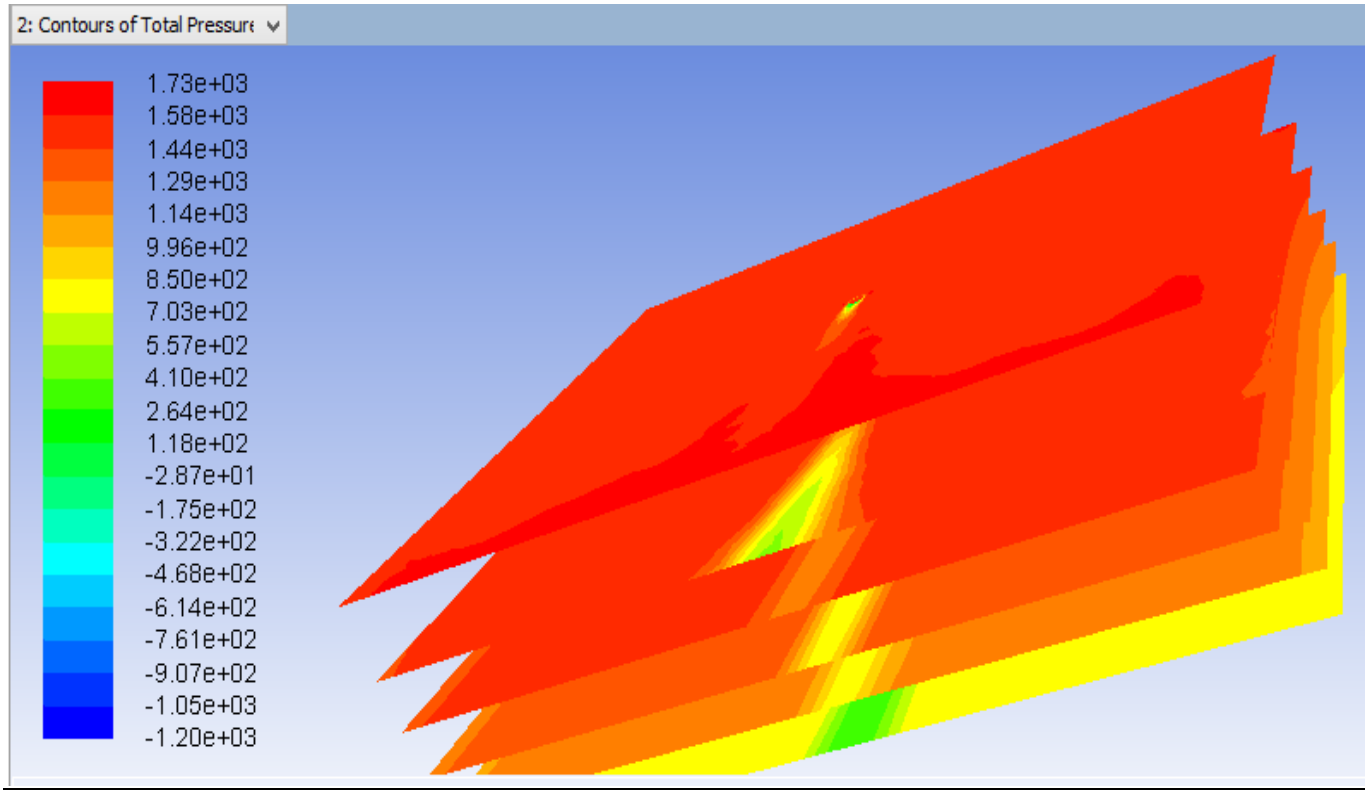
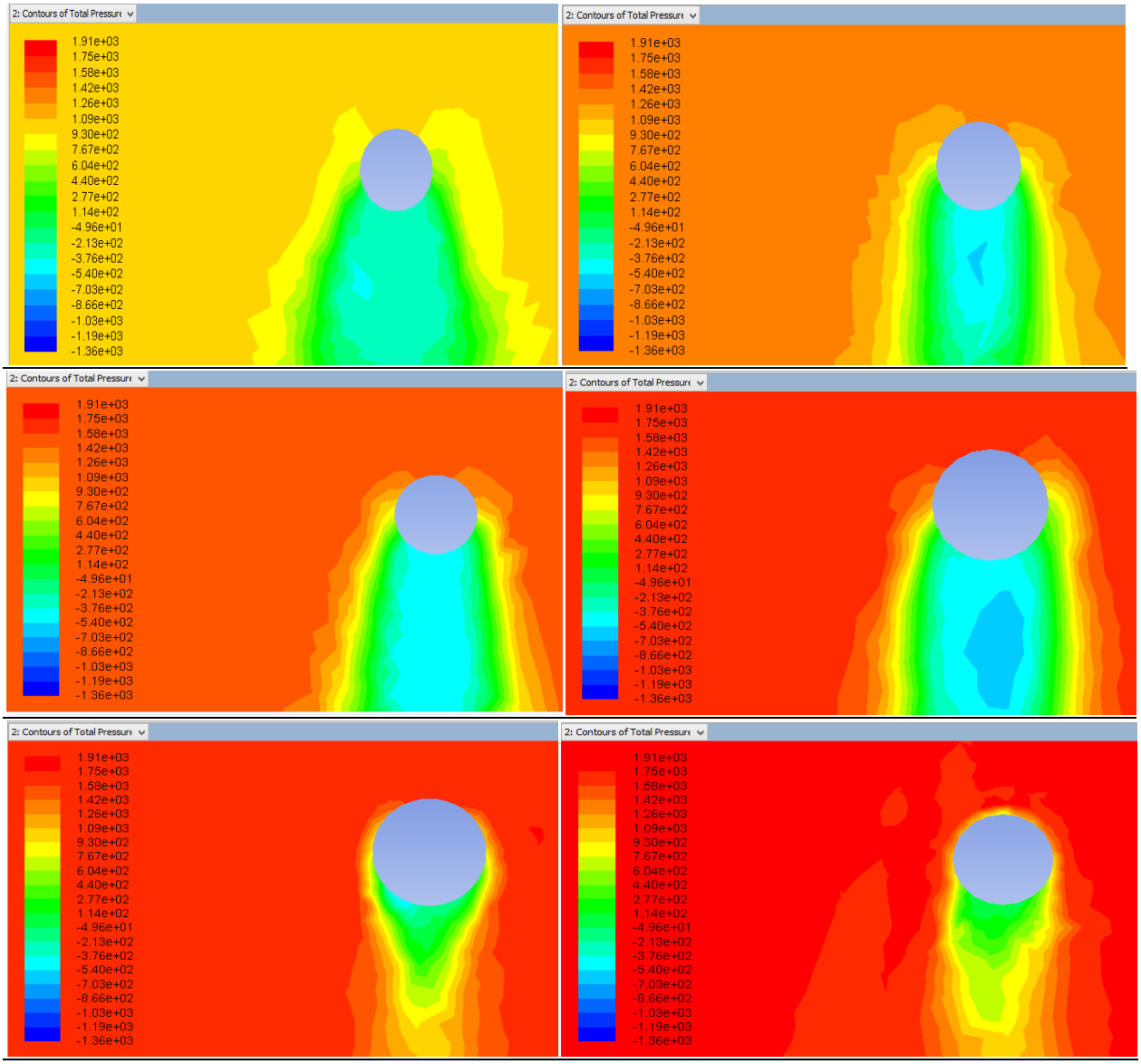
140
120
100
80
60
40
20
0
0
1000
2000



Cross sectional plane contours of total pressure at (0, 23, 46, 72, 102 and 145.5m)




2: Contours of Total Pressure
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1.75e+03
1.58e+03
1.42e+03
1.26e+03
1.09e+03
9.30e+02
7.67e+02
6.04e+02
4.40e+02
2.77e+02
1.14e+02
-4.96e+01
-2.13e+02
-3.76e+02
-5.40e+02
-7.03e+02
-8.66e+02
-1.03e+03
-1.19e+03
-1.36e+03

vb - Microsoft Excel

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Cut | Copy | Format Painter | Paste | Clipboard

Calibri | 11 | Font

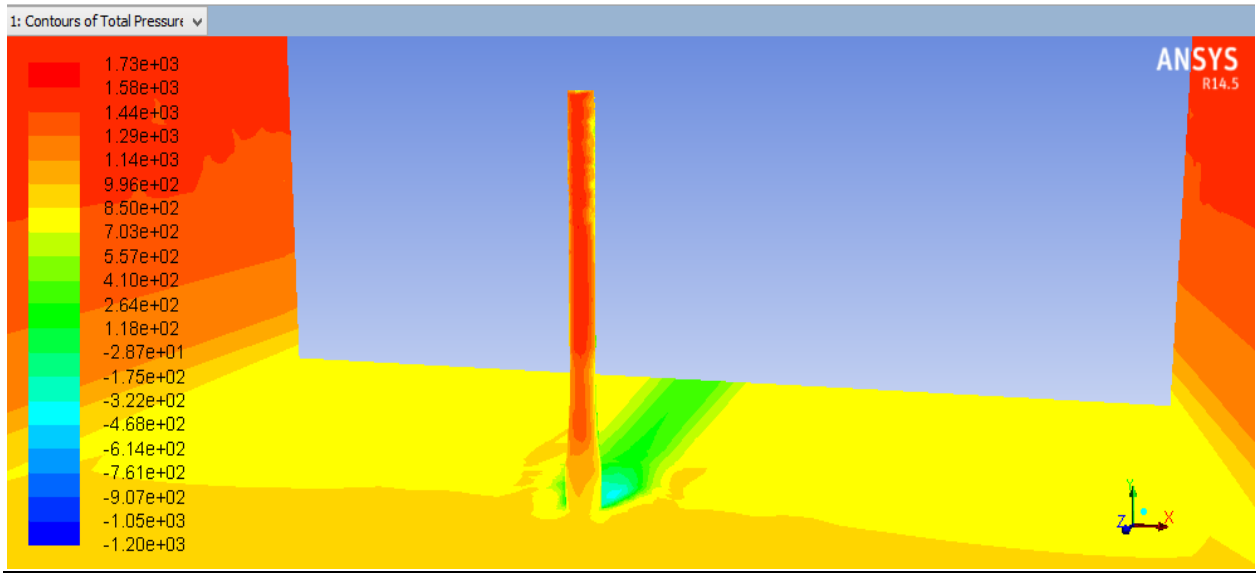
Wrap Text | Merge & Center | Alignment

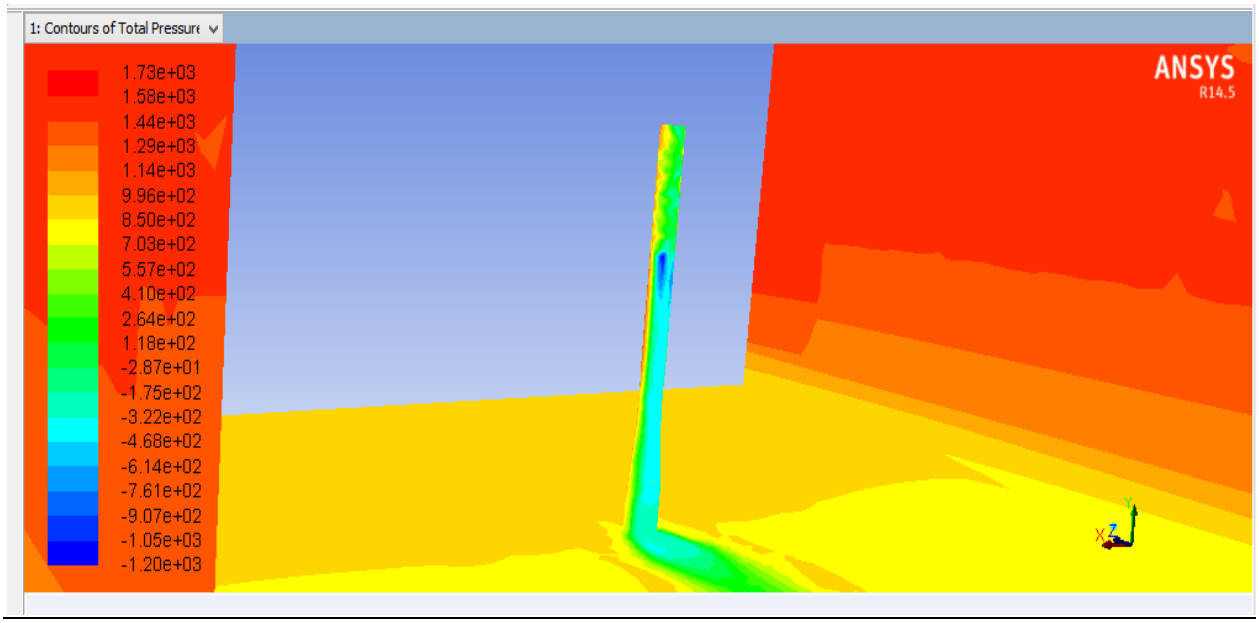
General | Number

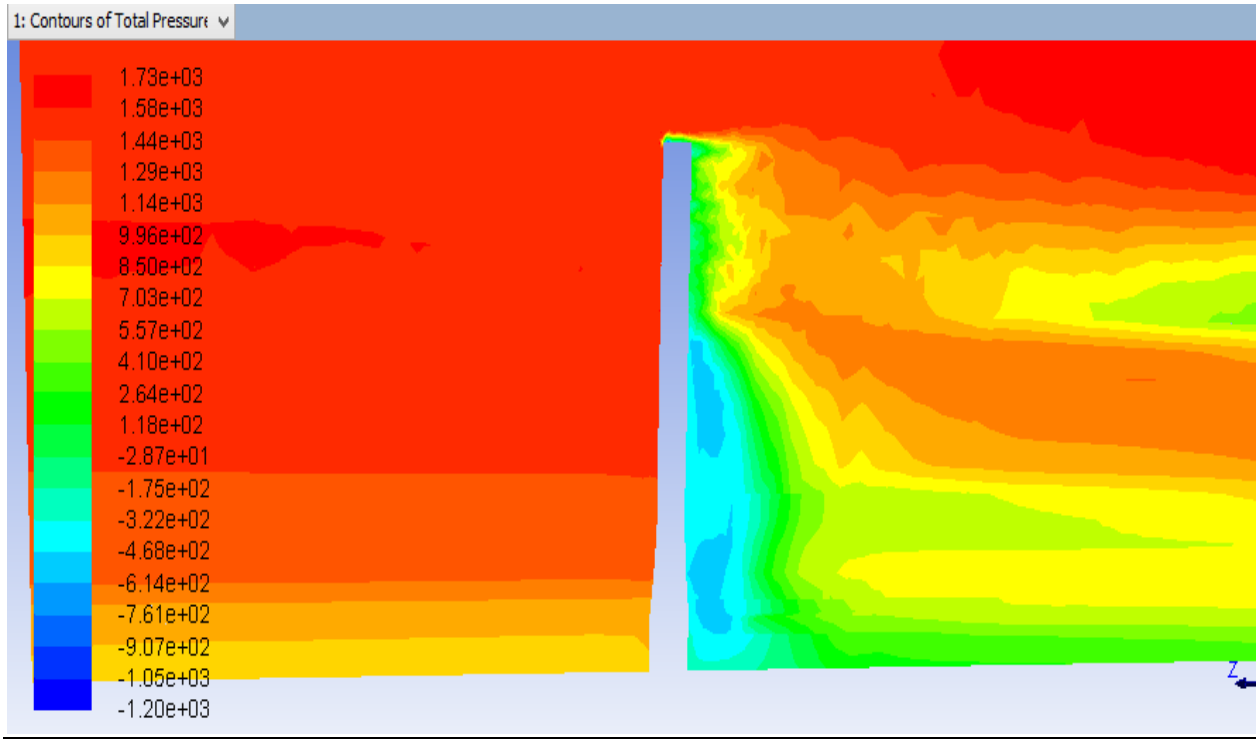
Conditional Formatting | Format as Table | Normal | Bad | Good | Neutral | Styles

E1 | v1

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																






1: Contours of Total Pressure
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7.03e+02
5.57e+02
4.10e+02
2.64e+02
1.18e+02
-2.87e+01
-1.75e+02
-3.22e+02
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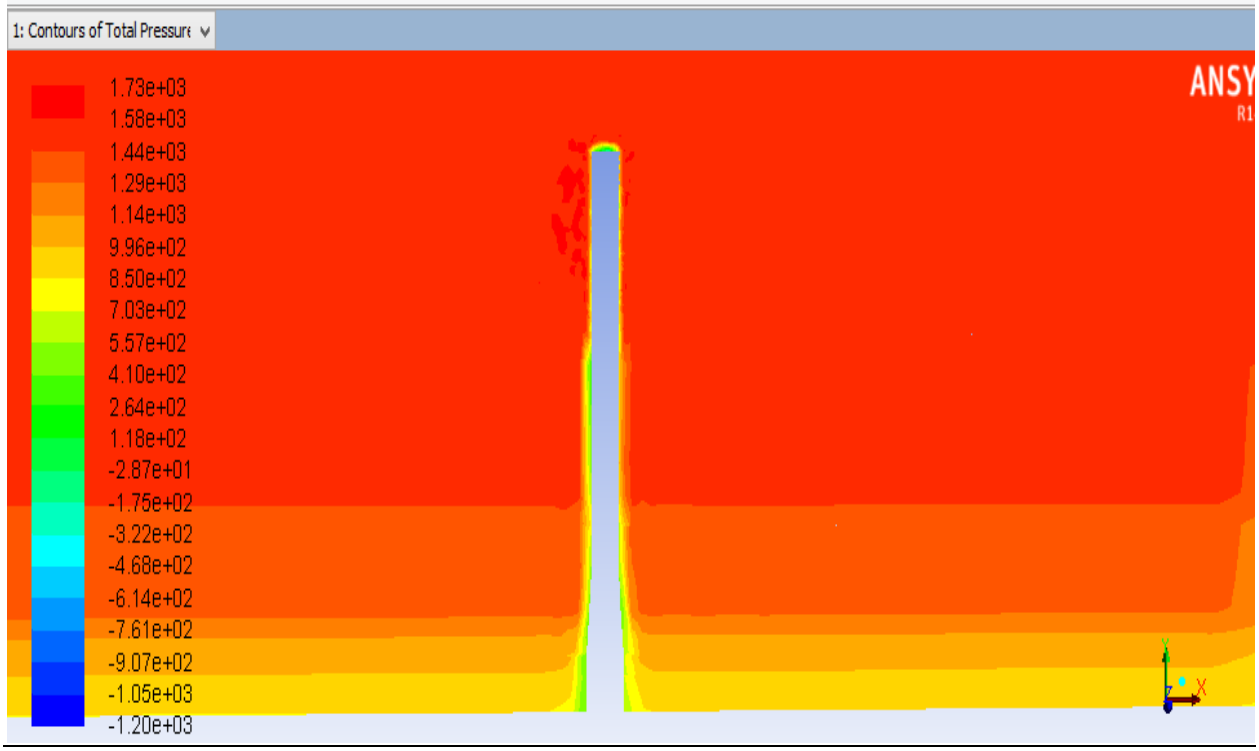
-9.07e+02
-1.05e+03
-1.20e+03
Z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7.03e+02
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4.10e+02
2.64e+02
1.18e+02
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-4.68e+02
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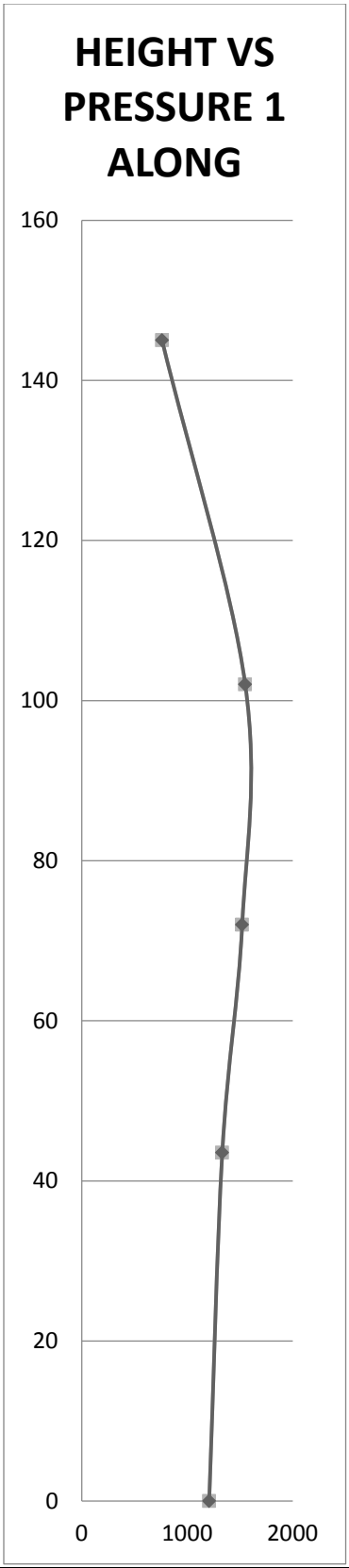
ANSY
R1
Y
X
Z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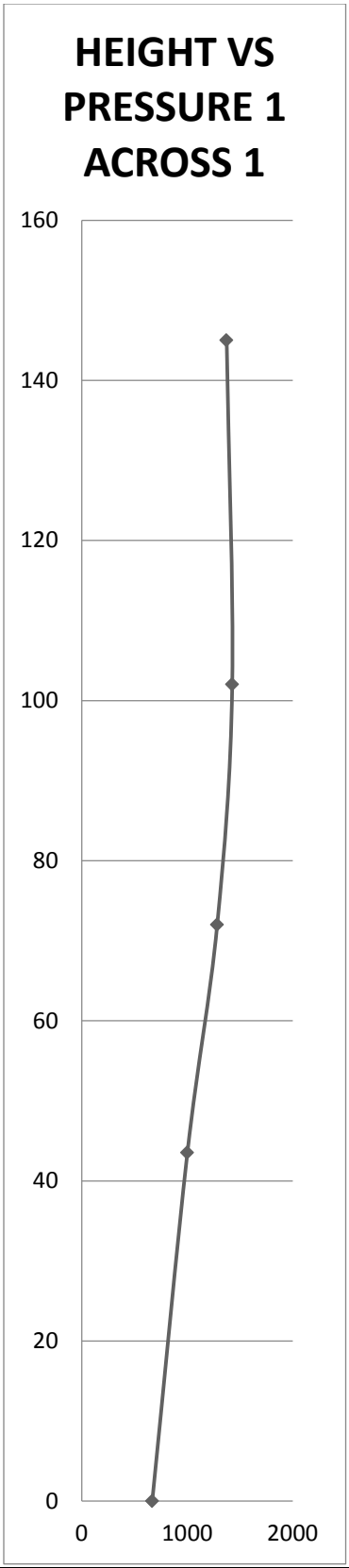
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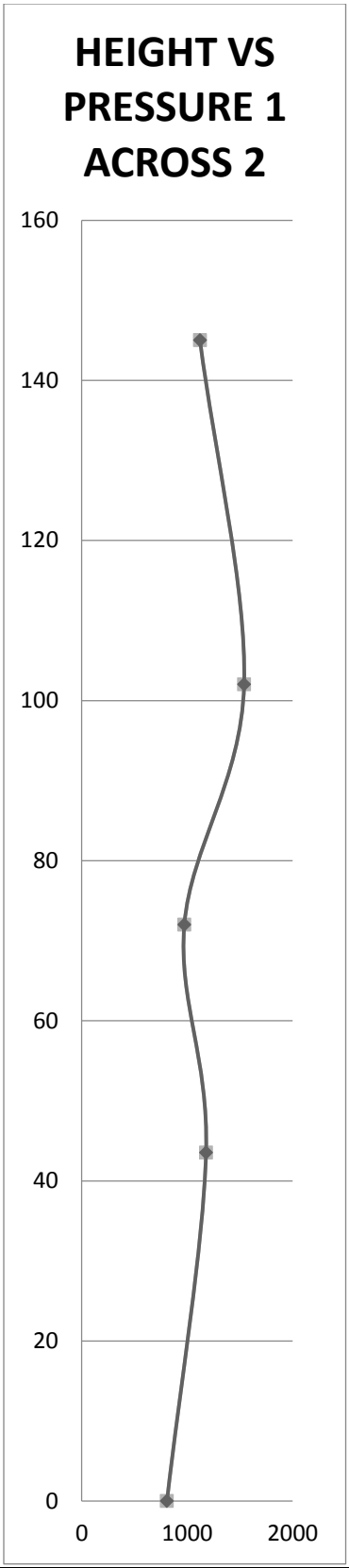
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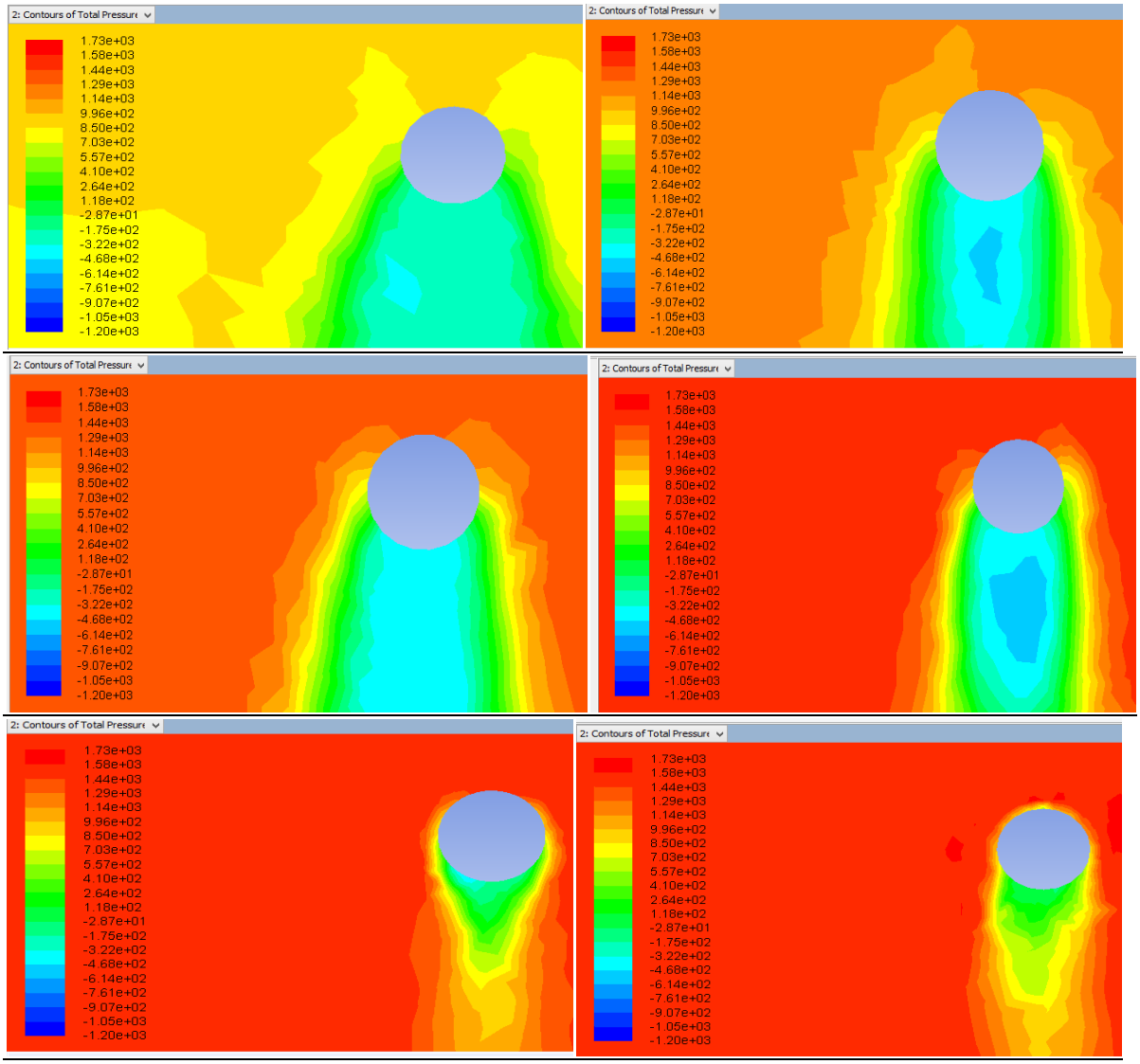
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7.03e+02
5.57e+02
4.10e+02
2.64e+02
1.18e+02
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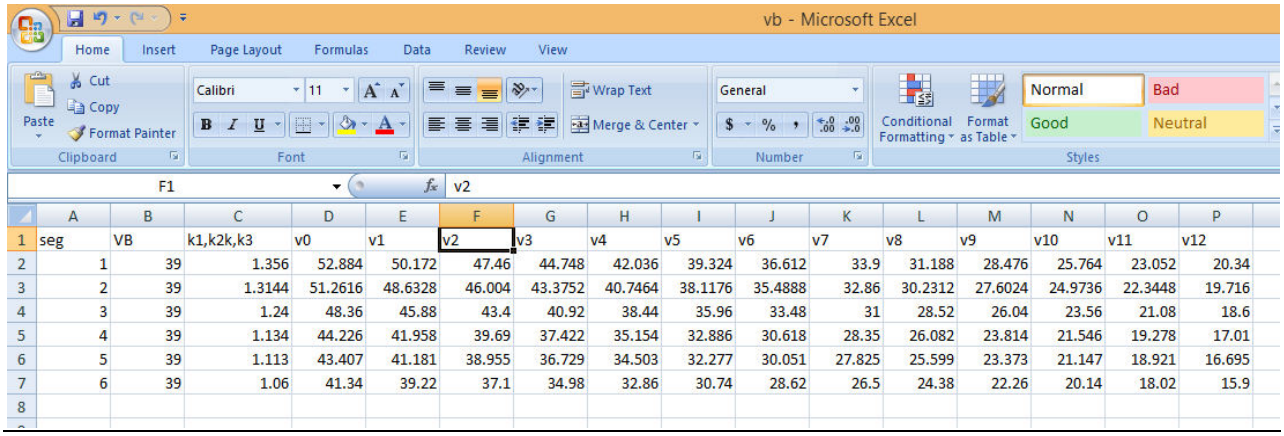
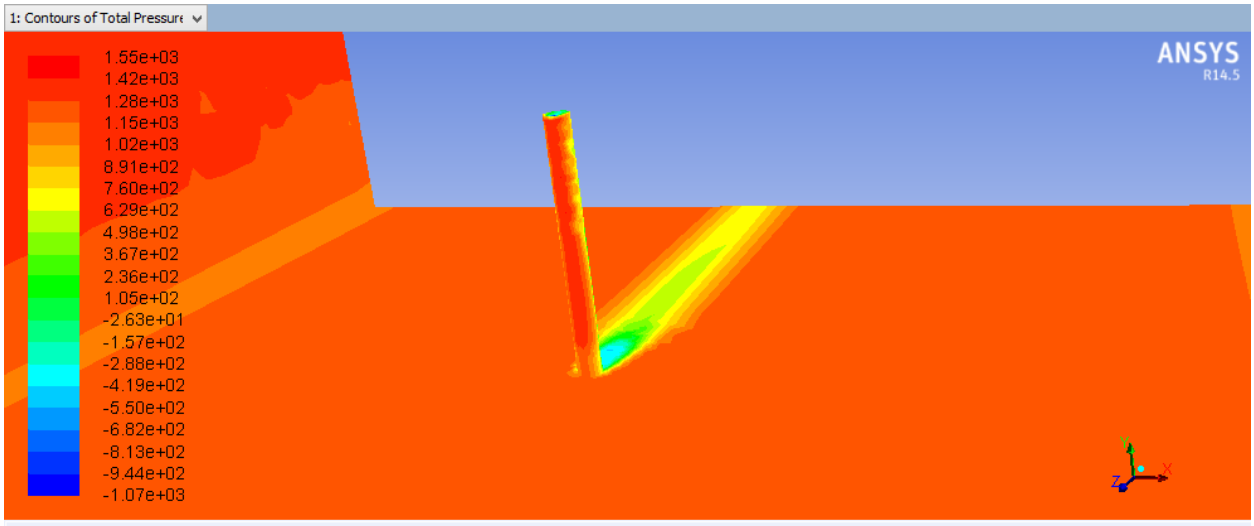
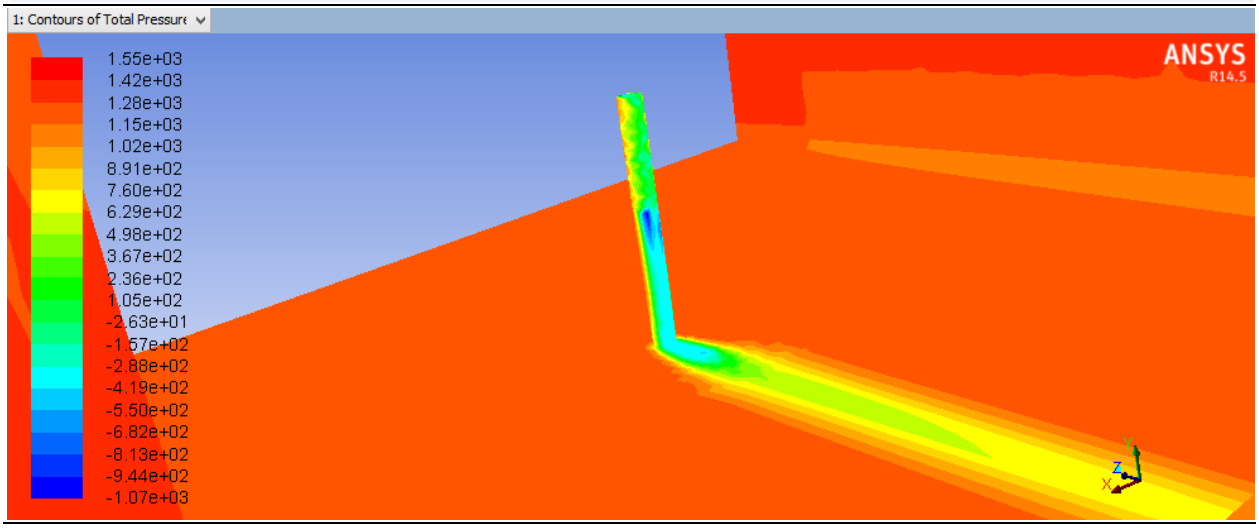
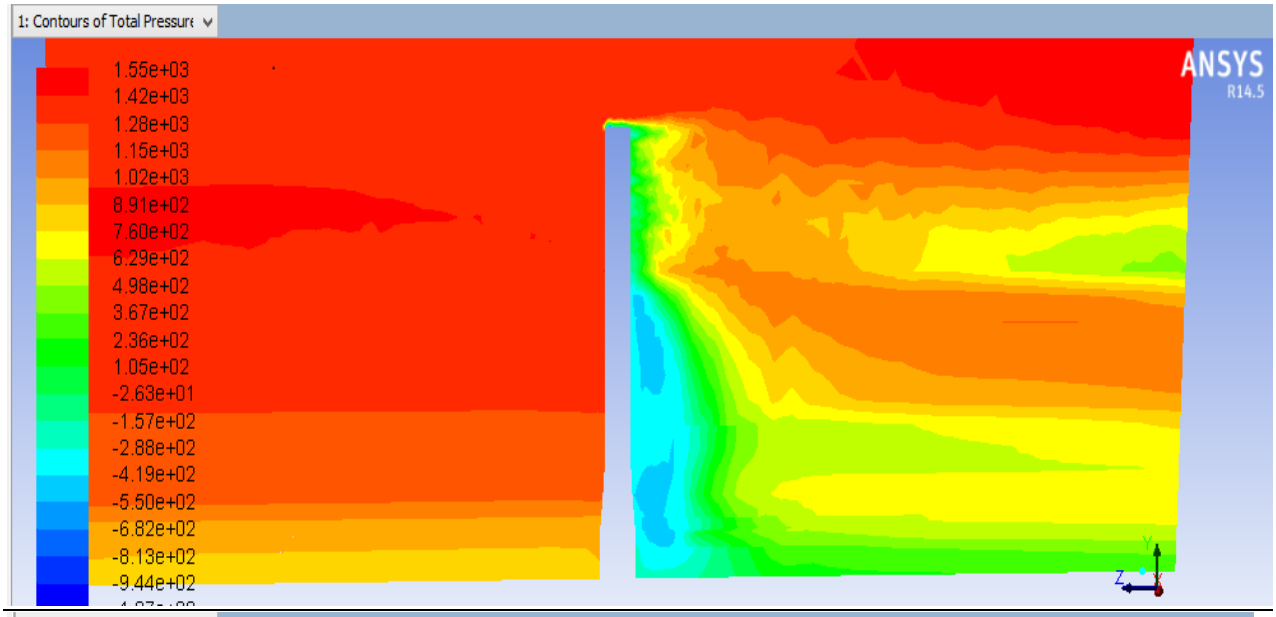


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																






1: Contours of Total Pressure
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1.28e+03
1.15e+03
1.02e+03
8.91e+02
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6.29e+02
4.98e+02
3.67e+02
2.36e+02
1.05e+02
-2.63e+01
-1.57e+02
-2.88e+02
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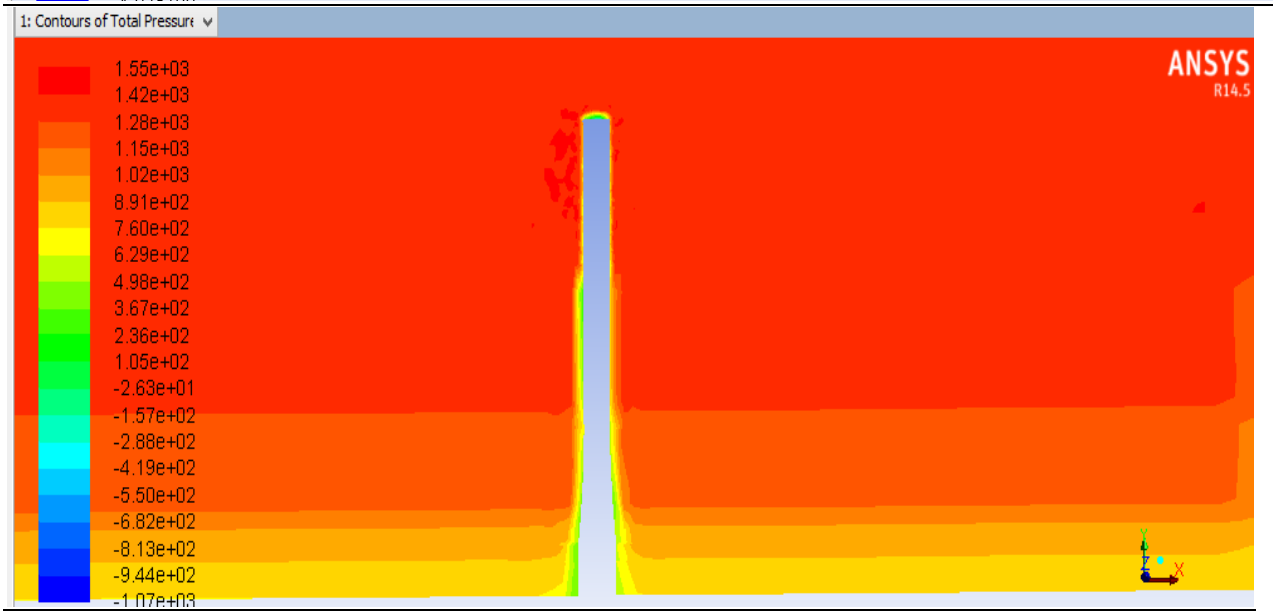
-8.13e+02
-9.44e+02
ANSYS
R14.5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1.42e+03
1.28e+03
1.15e+03
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8.91e+02
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6.29e+02
4.98e+02
3.67e+02
2.36e+02
1.05e+02
-2.63e+01
-1.57e+02
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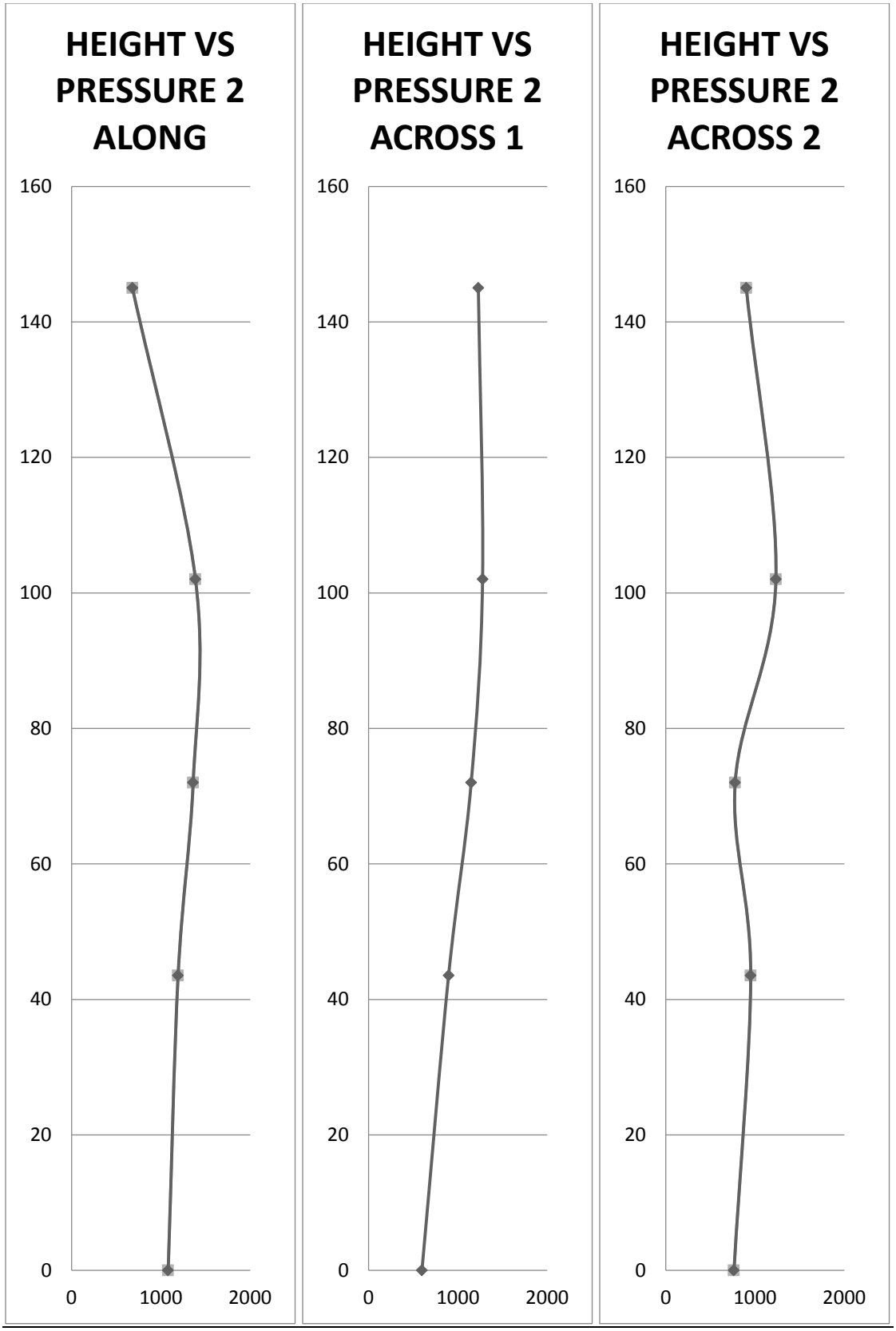
ANSYS
R14.5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120
100
80
60
40
20
0
0
1000
2000
HEIGHT VS PRESSURE 2 ACROSS 1
160
140
120
100
80
60
40
20
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HEIGHT VS PRESSURE 2 ACROSS 2
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140
120
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80
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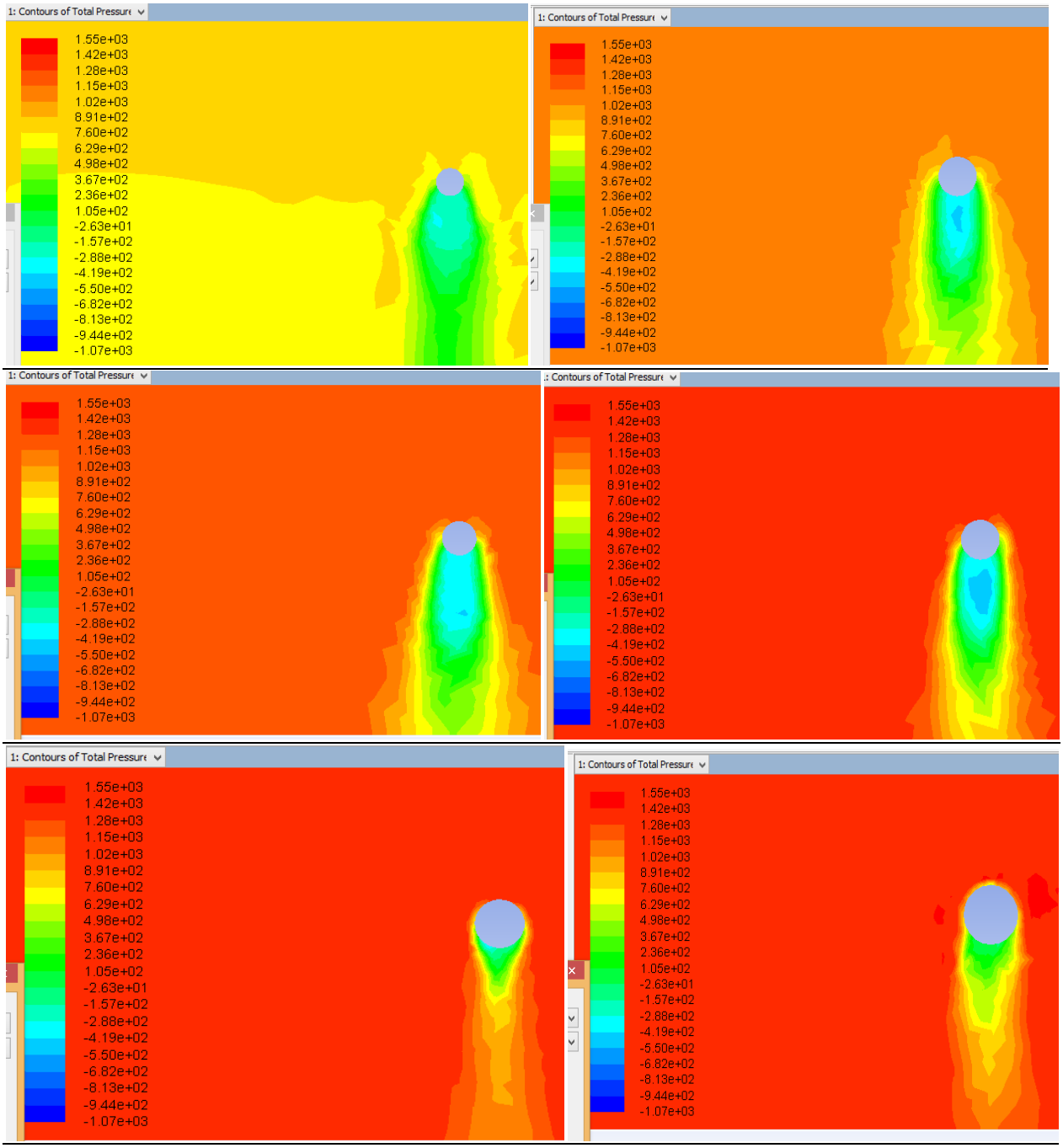
1000
2000


1: Contours of Total Pressure
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1.28e+03
1.15e+03
1.02e+03
8.91e+02
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6.29e+02
4.98e+02
3.67e+02
2.36e+02
1.05e+02
-2.63e+01
-1.57e+02
-2.88e+02
-4.19e+02
-5.50e+02
-6.82e+02
-8.13e+02
-9.44e+02
-1.07e+03

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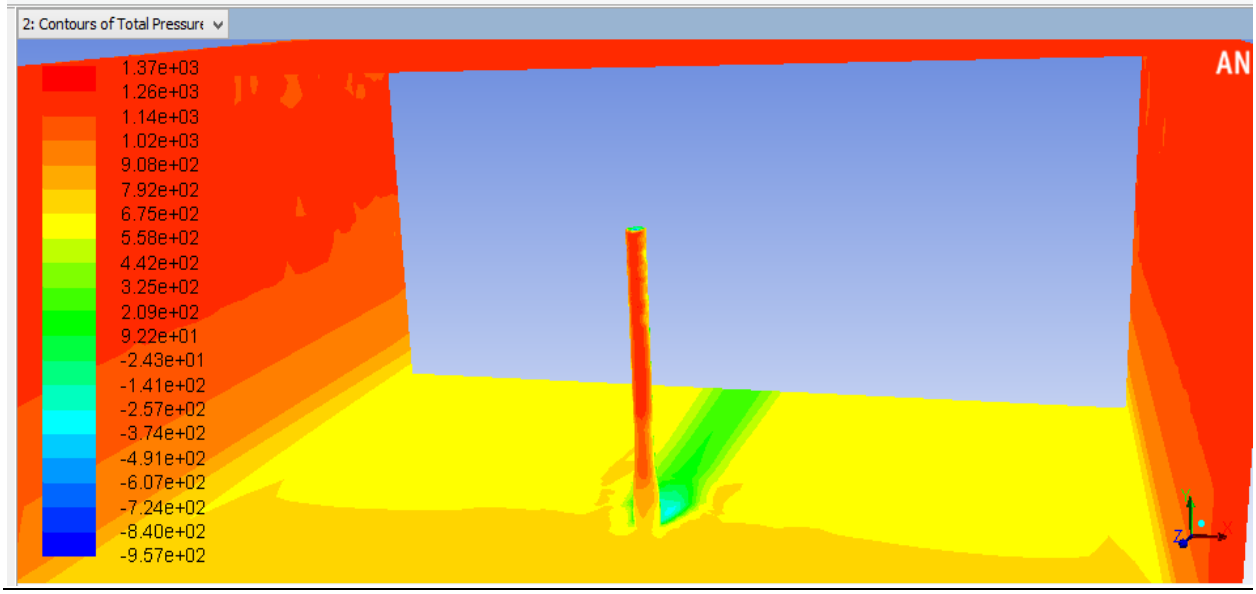
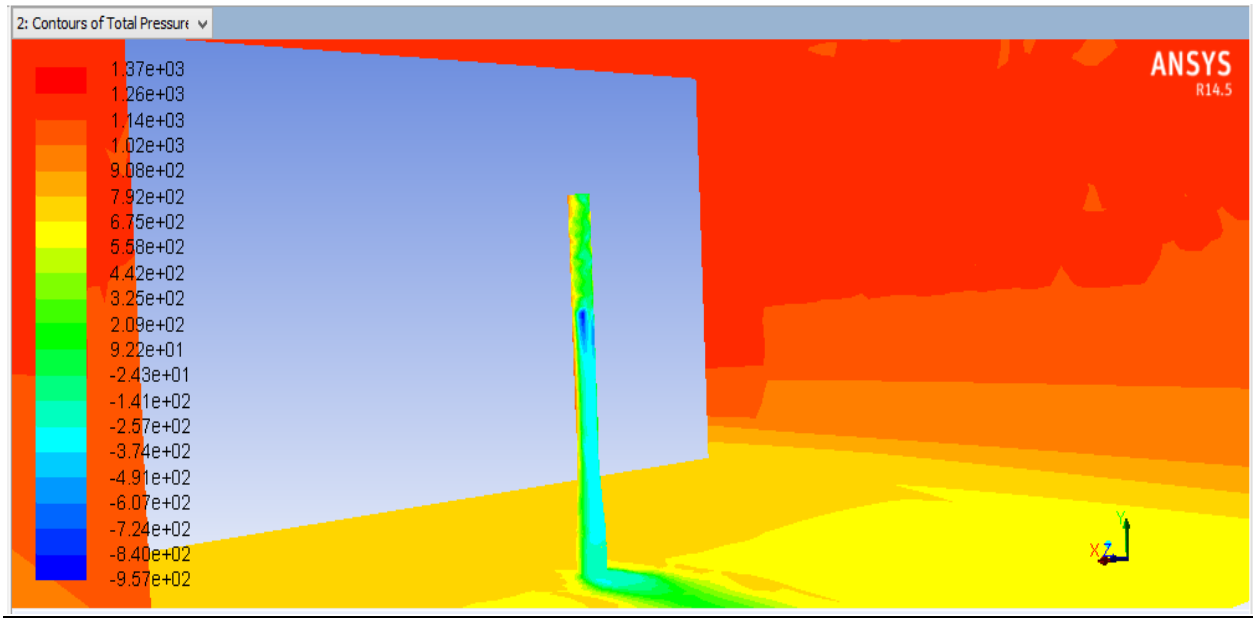
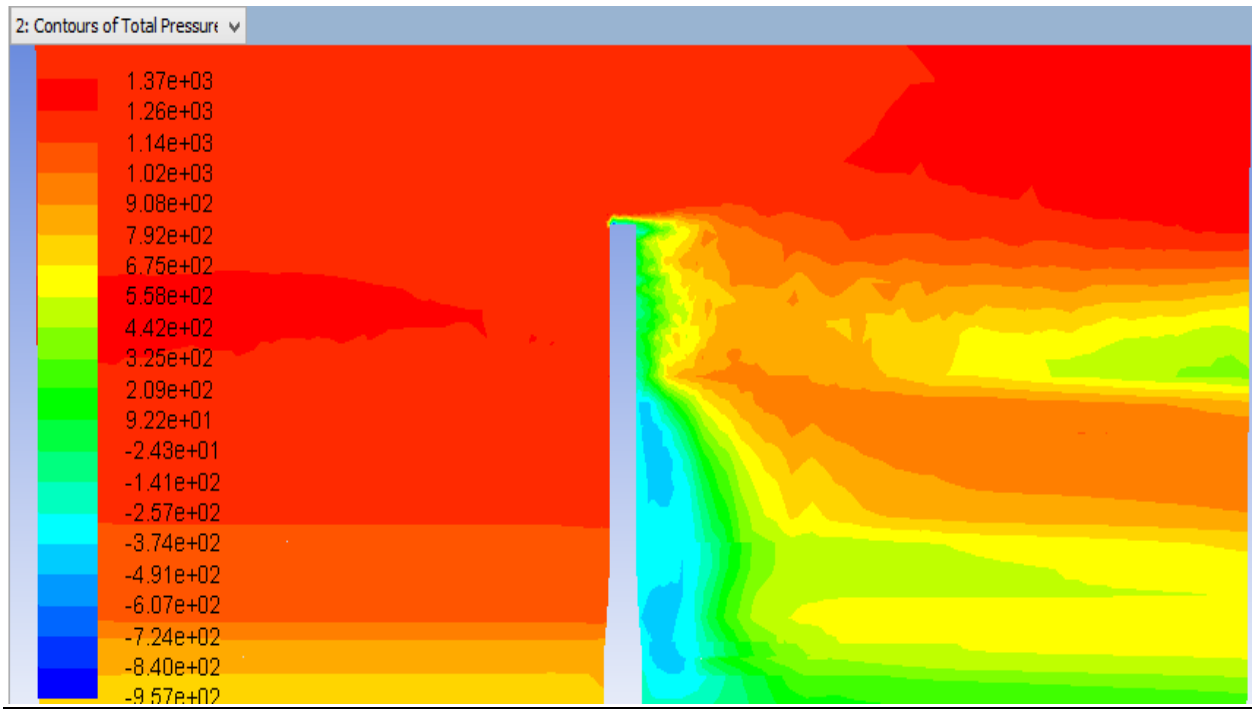
G1 | v3

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695






2: Contours of Total Pressure
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1.26e+03
1.14e+03
1.02e+03
9.08e+02
7.92e+02
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5.58e+02
4.42e+02
3.25e+02
2.09e+02
9.22e+01
-2.43e+01
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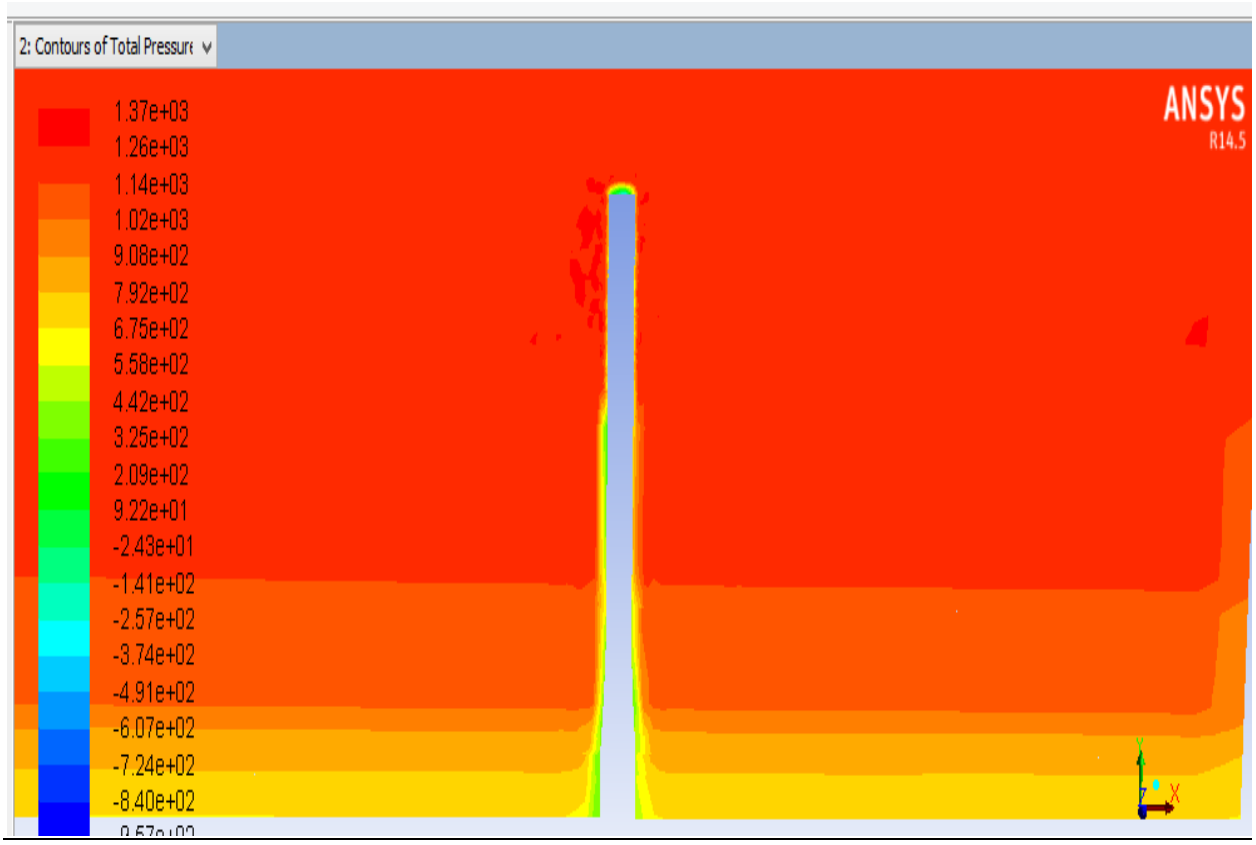
-8.40e+02


2: Contours of Total Pressure
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1.26e+03
1.14e+03
1.02e+03
9.08e+02
7.92e+02
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5.58e+02
4.42e+02
3.25e+02
2.09e+02
9.22e+01
-2.43e+01
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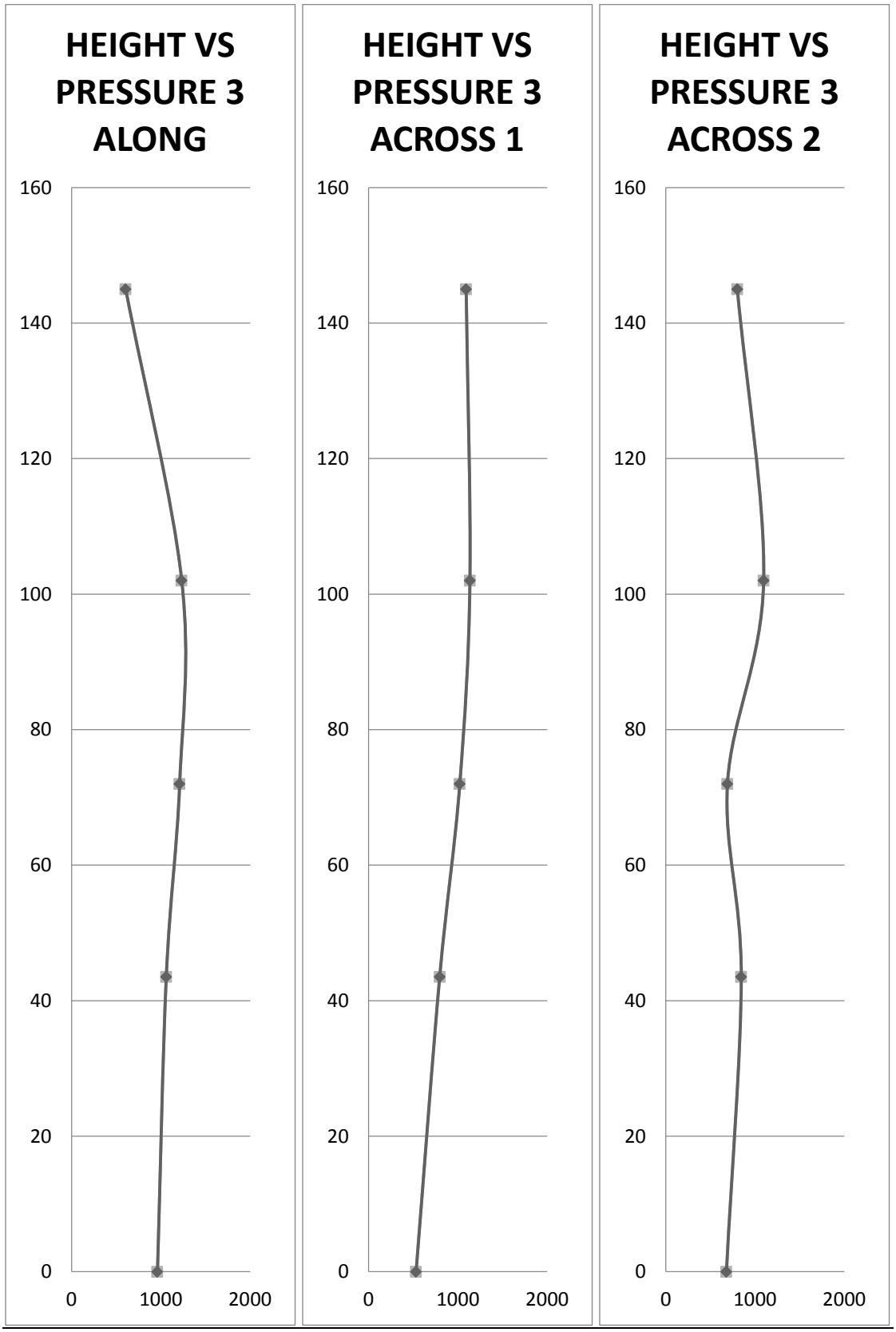
ANSYS
R14.5


HEIGHT VS PRESSURE 3 ALONG
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HEIGHT VS PRESSURE 3 ACROSS 1
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120
100
80
60
40
20
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HEIGHT VS PRESSURE 3 ACROSS 2
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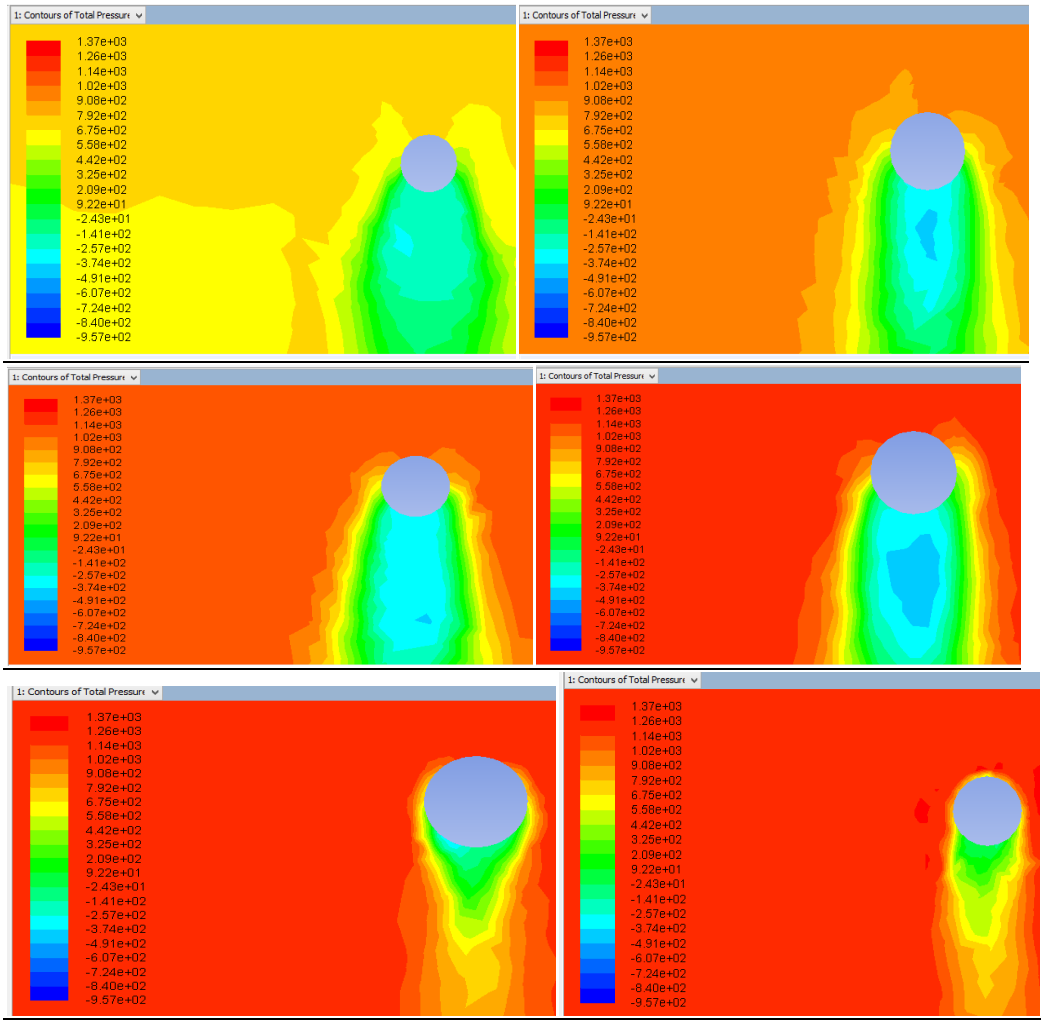
1: Contours of Total Pressure
1.37e+03
1.26e+03
1.14e+03
1.02e+03
9.08e+02
7.92e+02
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5.58e+02
4.42e+02
3.25e+02
2.09e+02
9.22e+01
-2.43e+01
-1.41e+02
-2.57e+02
-3.74e+02
-4.91e+02
-6.07e+02
-7.24e+02
-8.40e+02
-9.57e+02

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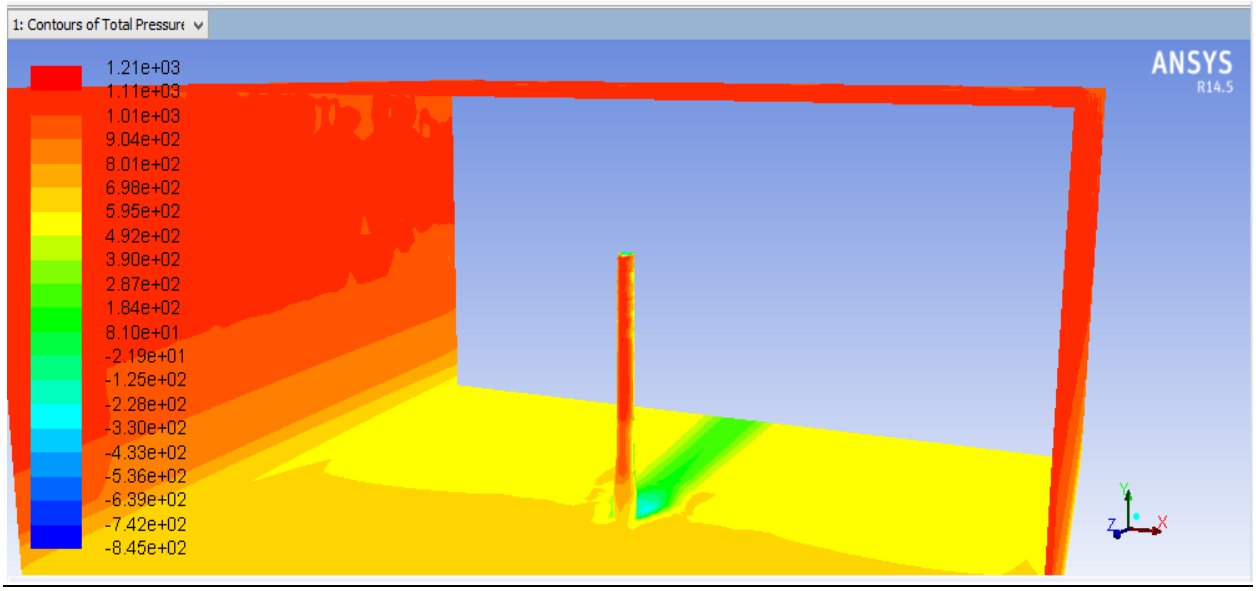
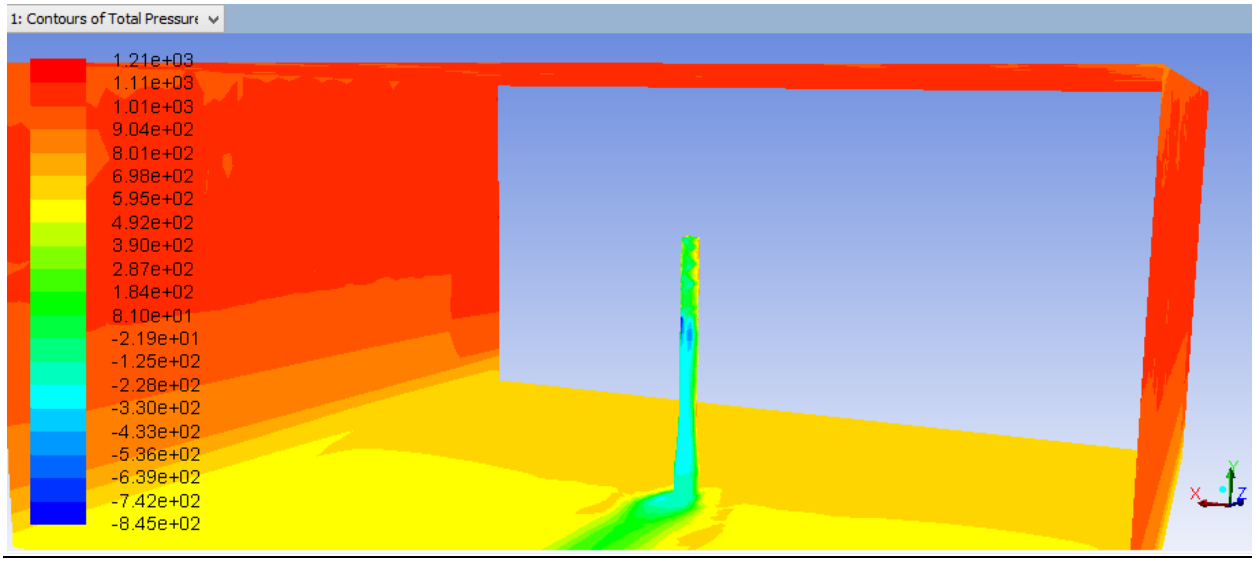
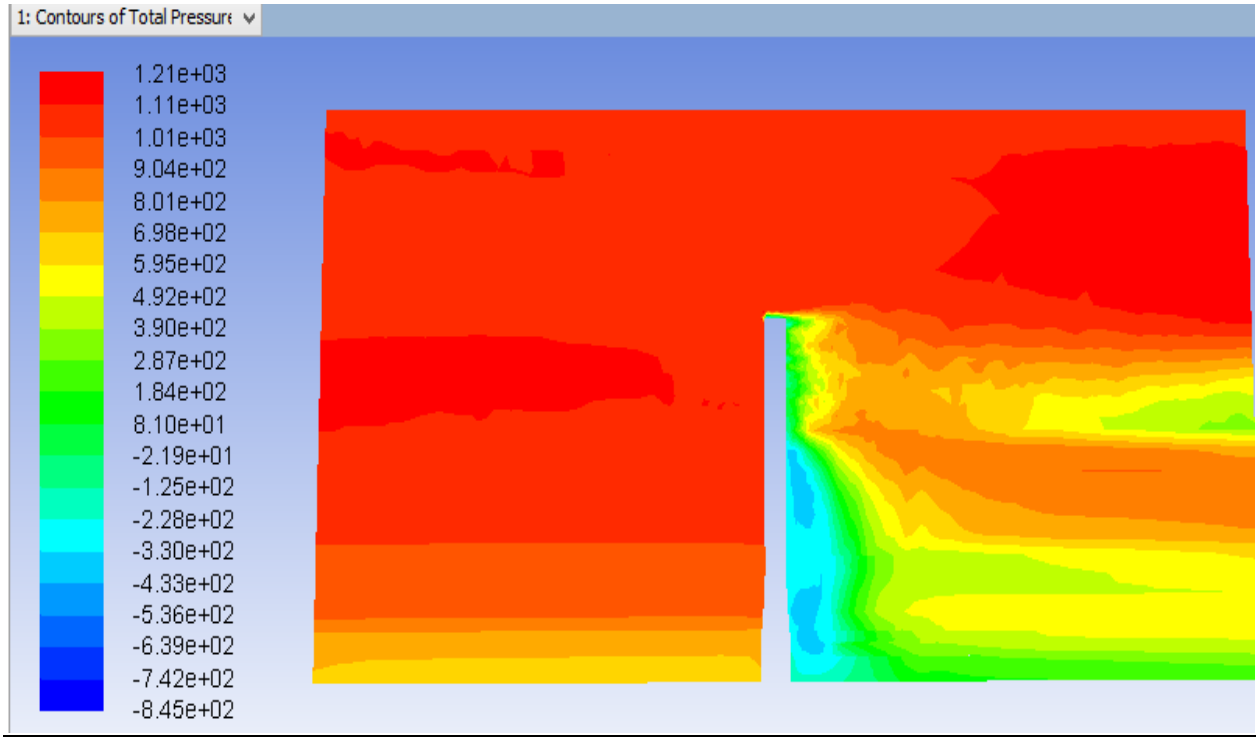
Conditional Formatting, Format as Table — Styles
Normal, Bad, Good, Neutral

H1 | v4

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																






1: Contours of Total Pressure
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1.11e+03
1.01e+03
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8.01e+02
6.98e+02
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4.92e+02
3.90e+02
2.87e+02
1.84e+02
8.10e+01
-2.19e+01
-1.25e+02
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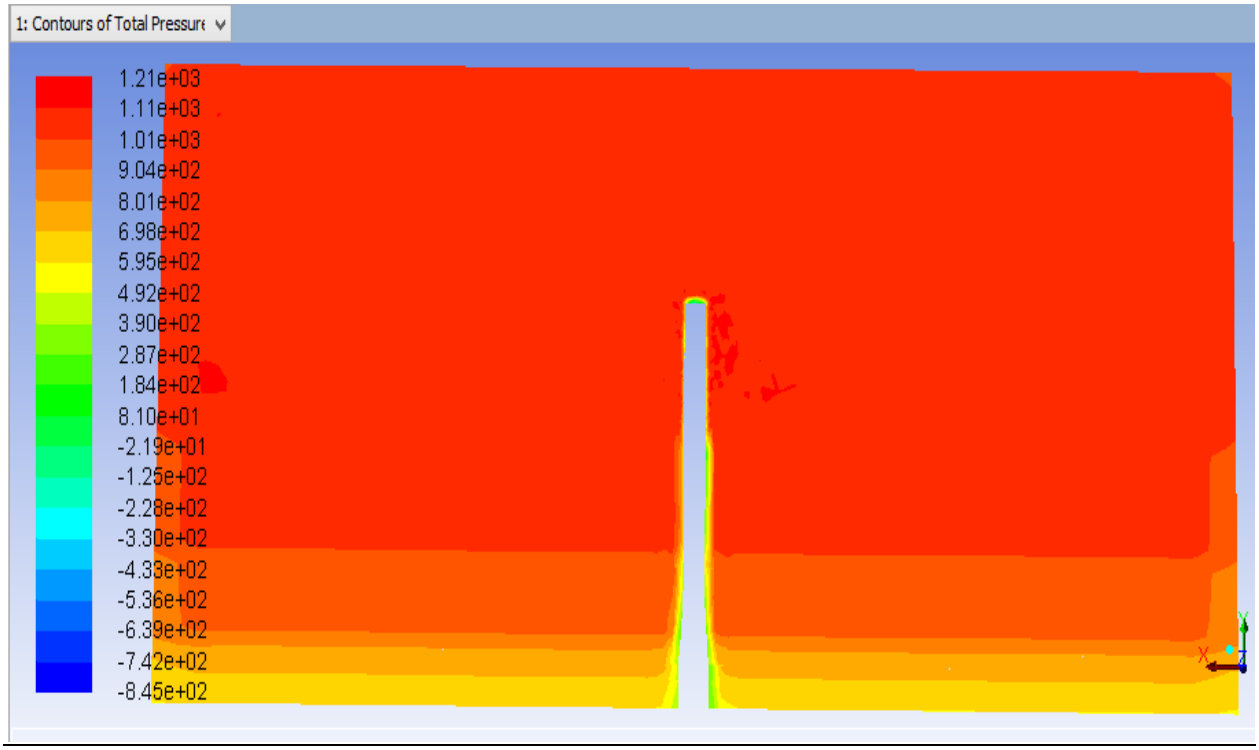
1: Contours of Total Pressure
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1.11e+03
1.01e+03
9.04e+02
8.01e+02
6.98e+02
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4.92e+02
3.90e+02
2.87e+02
1.84e+02
8.10e+01
-2.19e+01
-1.25e+02
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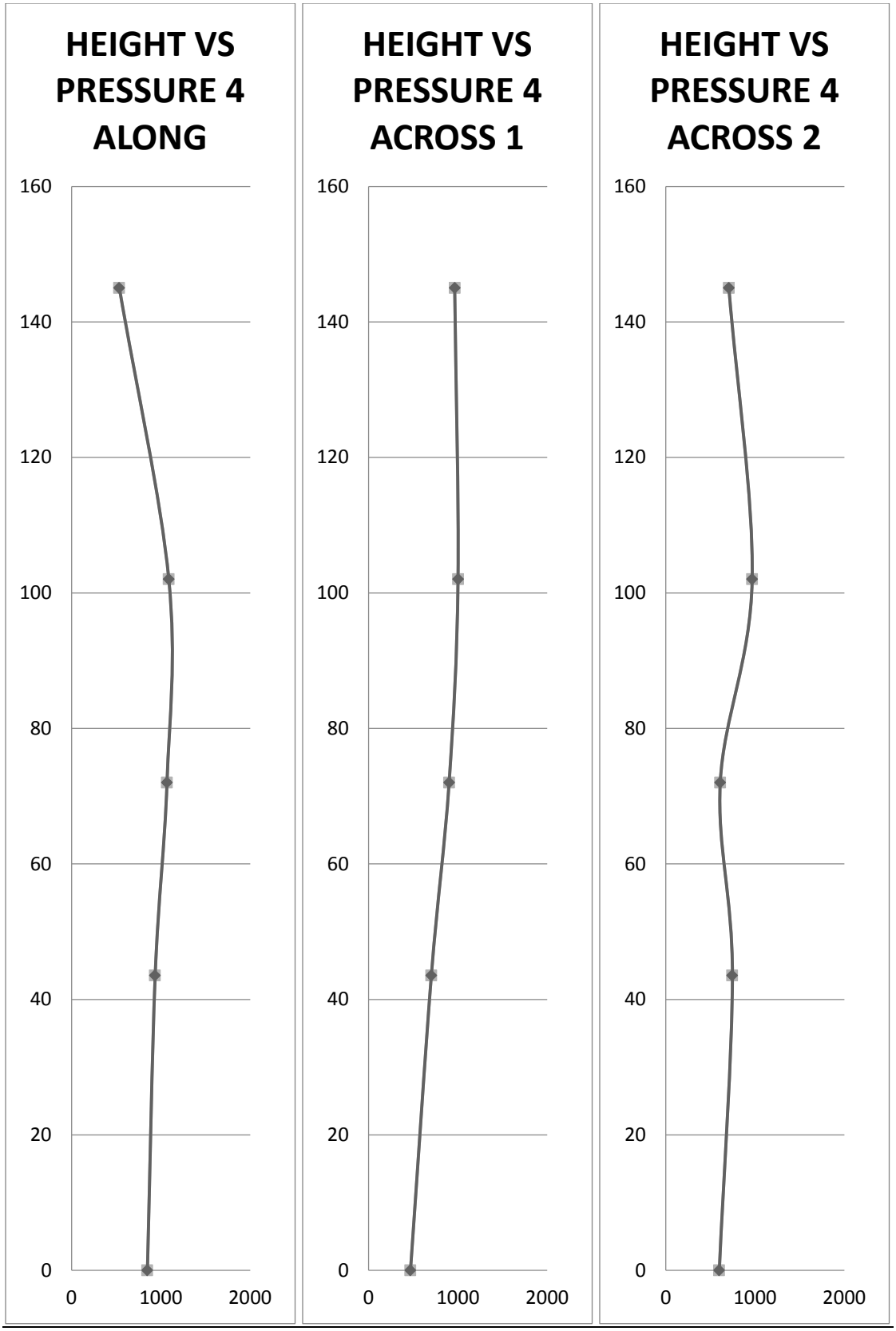
HEIGHT VS PRESSURE 4 ALONG
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HEIGHT VS PRESSURE 4 ACROSS 1
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80
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40
20
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HEIGHT VS PRESSURE 4 ACROSS 2
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80
60
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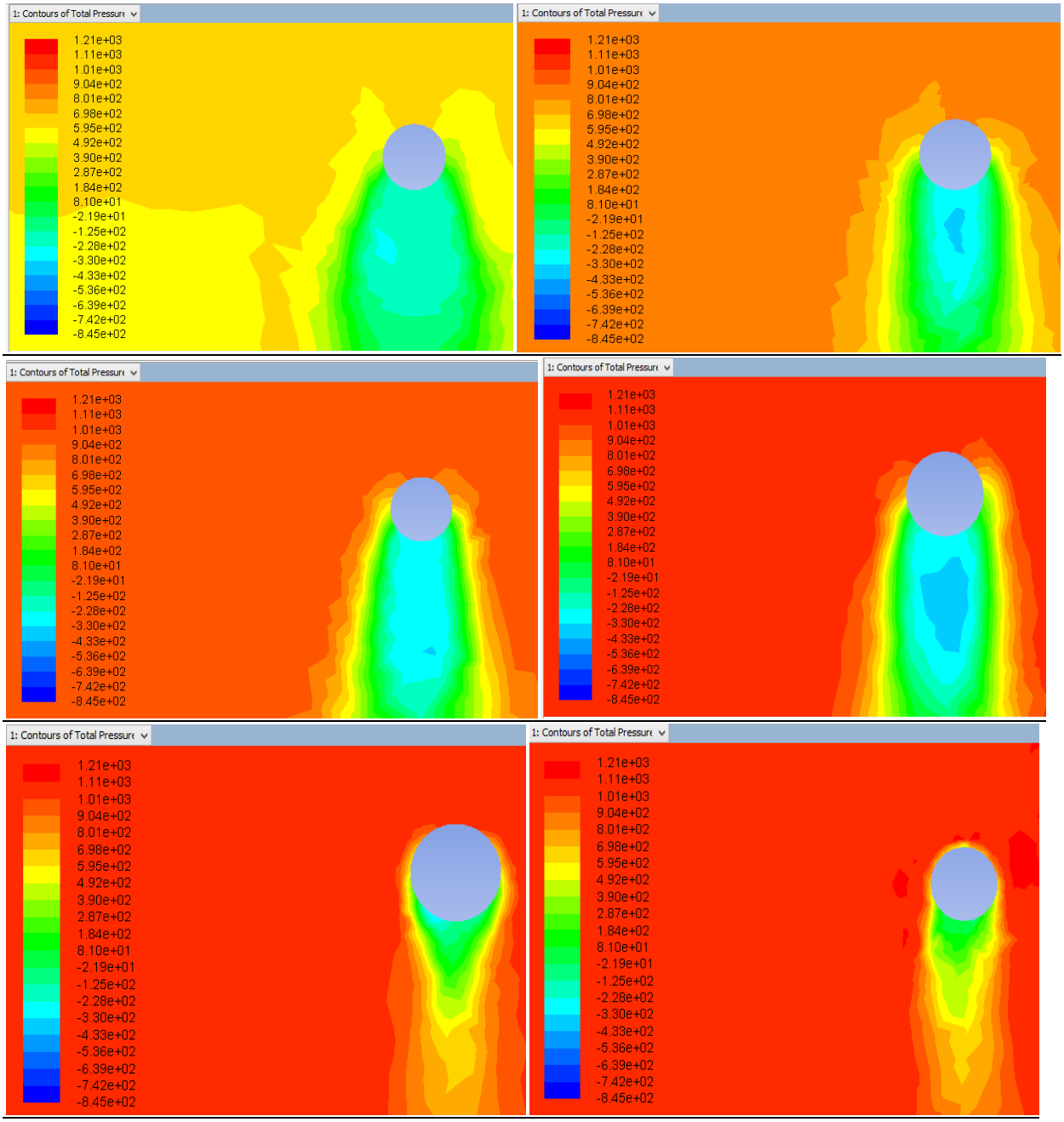
20
0
0
1000
2000


1: Contours of Total Pressure
1.21e+03
1.11e+03
1.01e+03
9.04e+02
8.01e+02
6.98e+02
5.95e+02
4.92e+02
3.90e+02
2.87e+02
1.84e+02
8.10e+01
-2.19e+01
-1.25e+02
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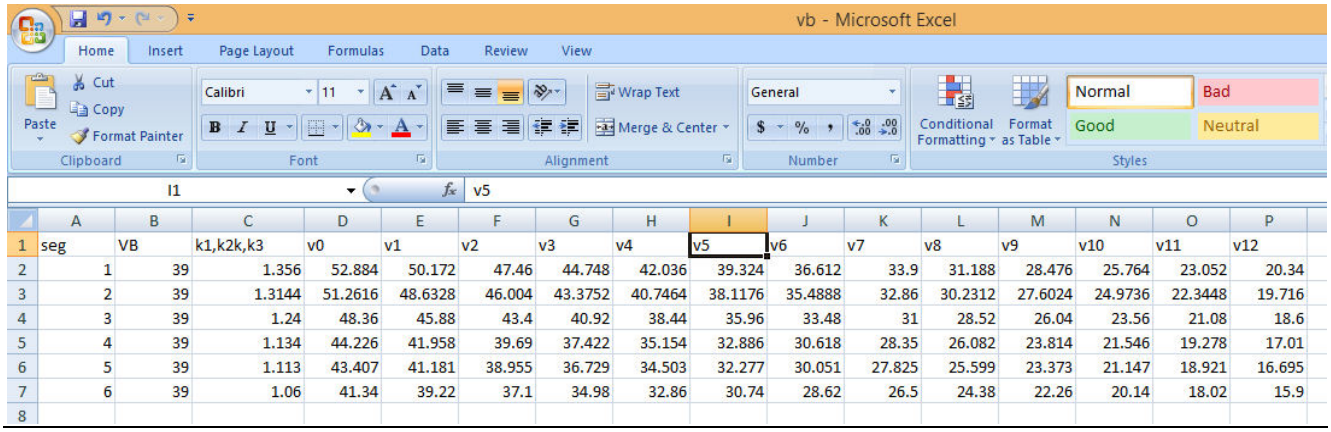
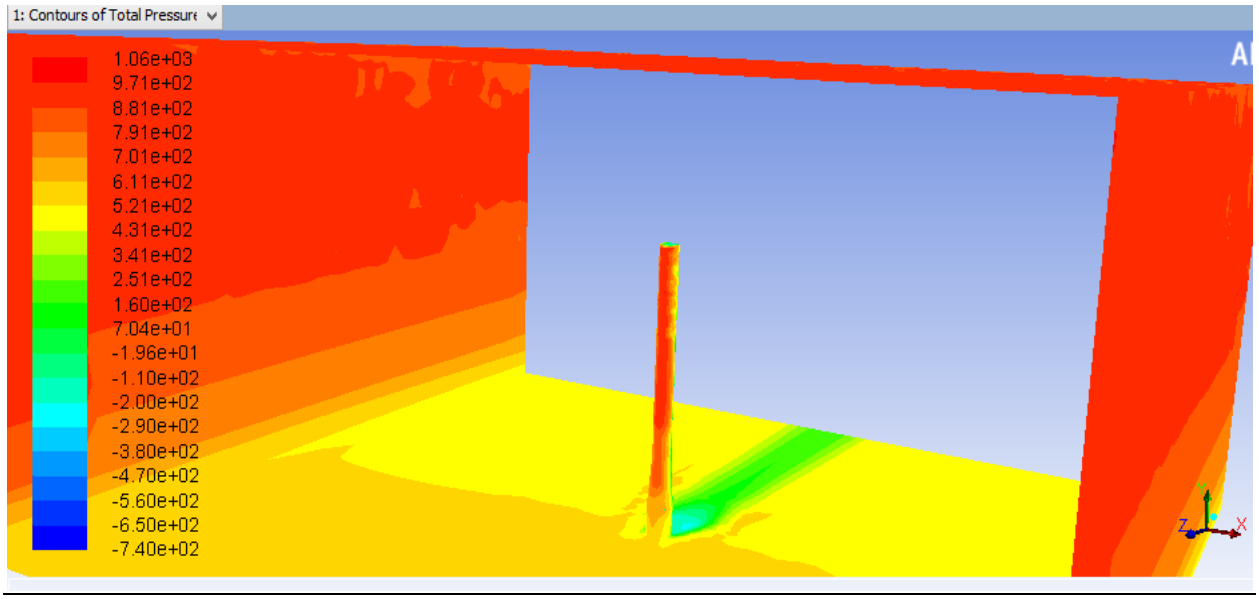
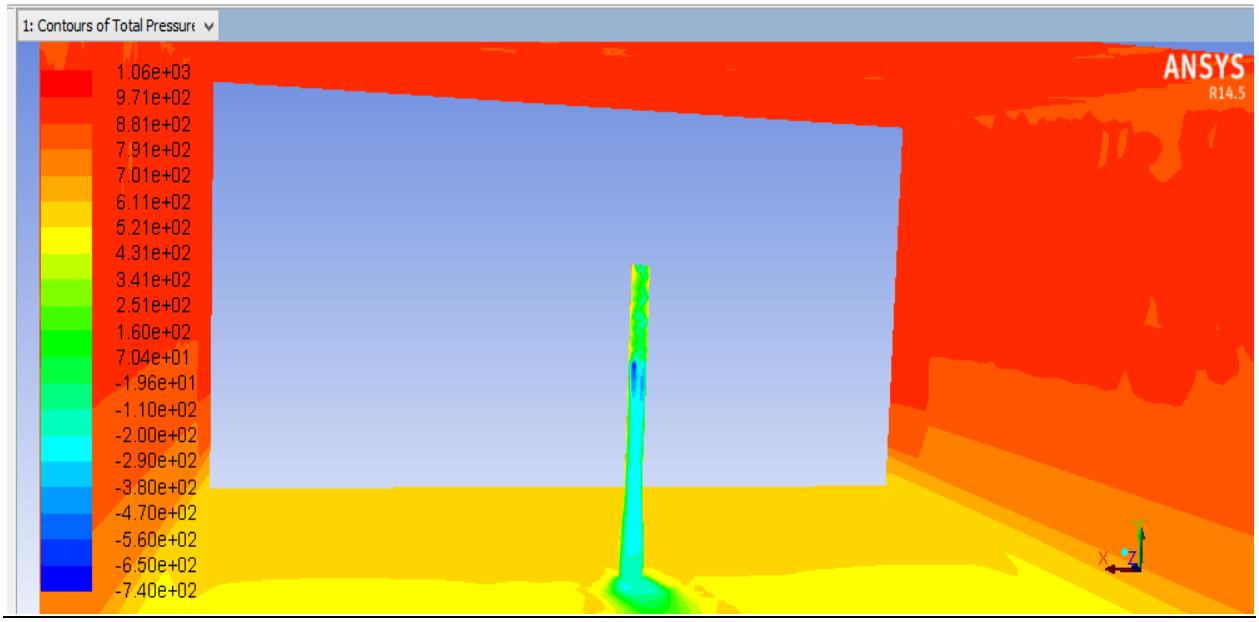
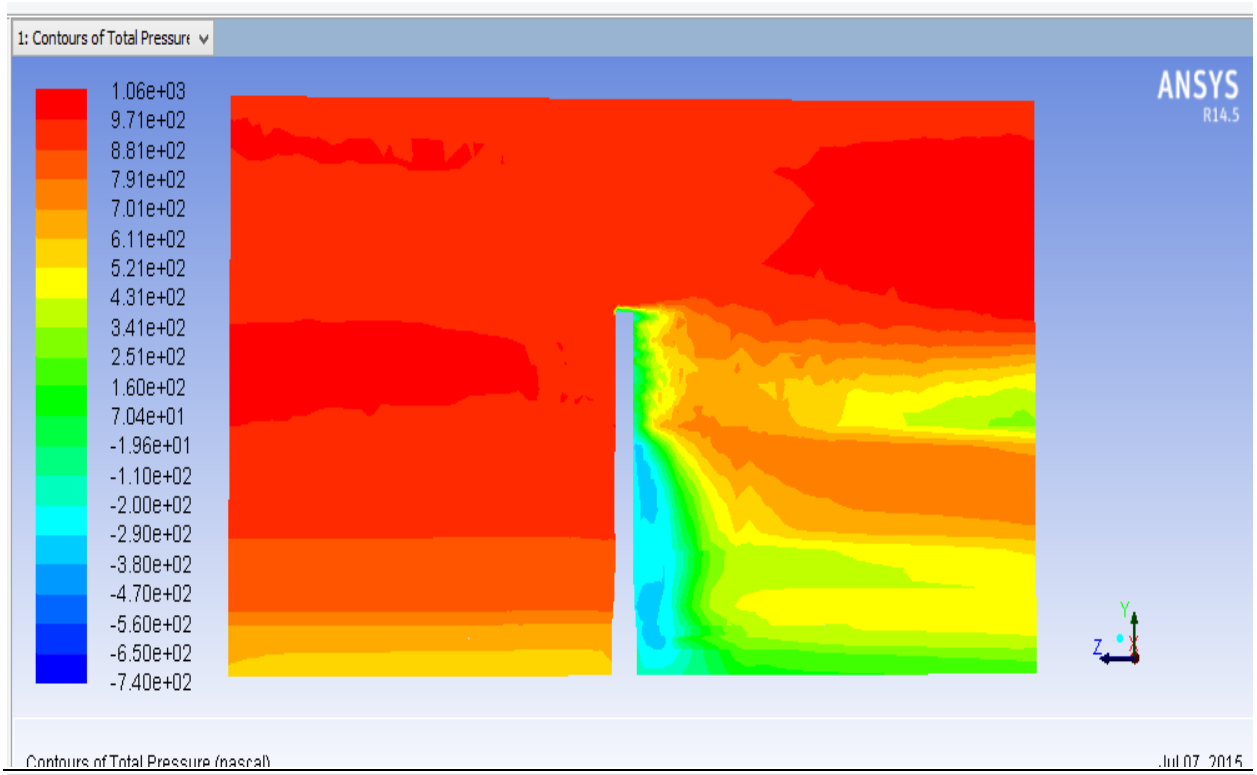


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																



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7.01e+02
6.11e+02
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4.31e+02
3.41e+02
2.51e+02
1.60e+02
7.04e+01
-1.96e+01
-1.10e+02
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-3.80e+02
-4.70e+02
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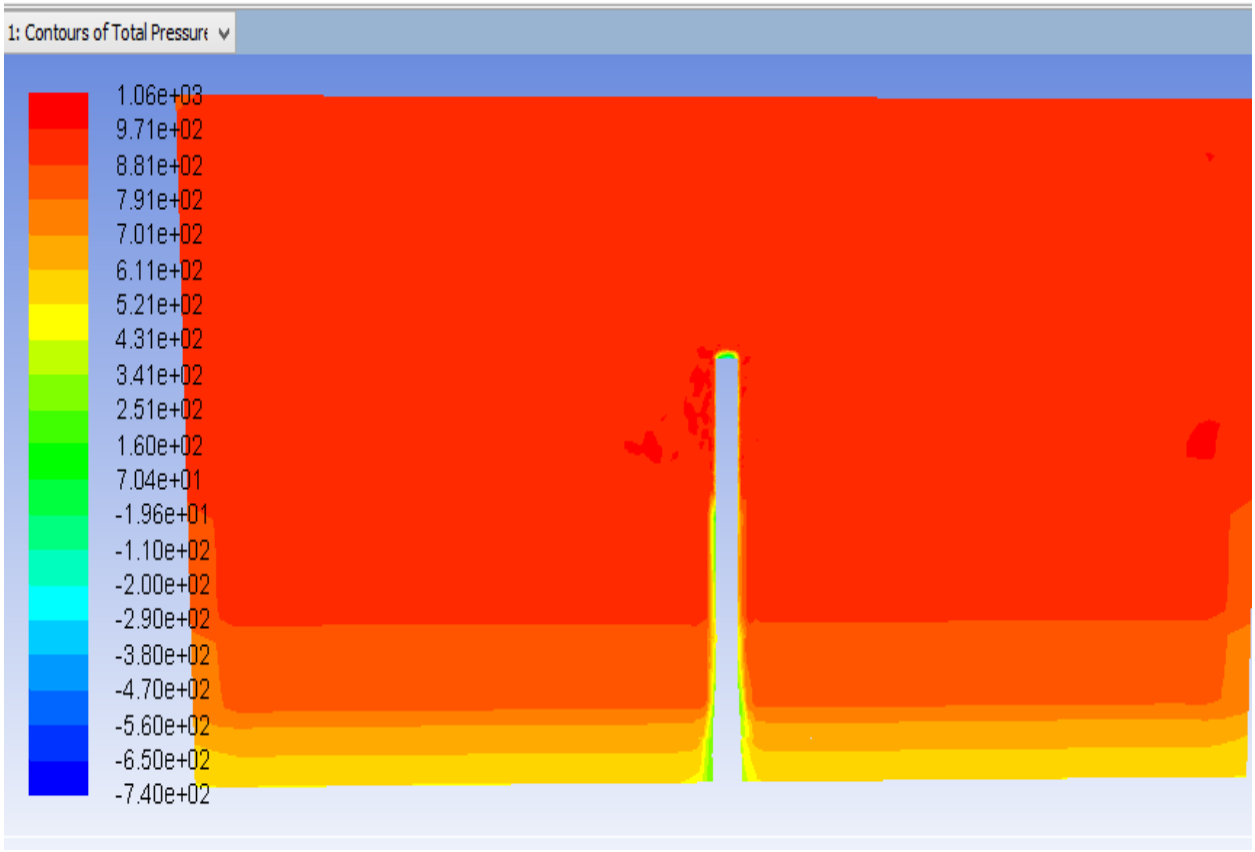
-7.40e+02
ANSYS
R14.5
Y
Z
X
Contours of Total Pressure (pascal)
Jul 07, 2015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8.81e+02
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6.11e+02
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4.31e+02
3.41e+02
2.51e+02
1.60e+02
7.04e+01
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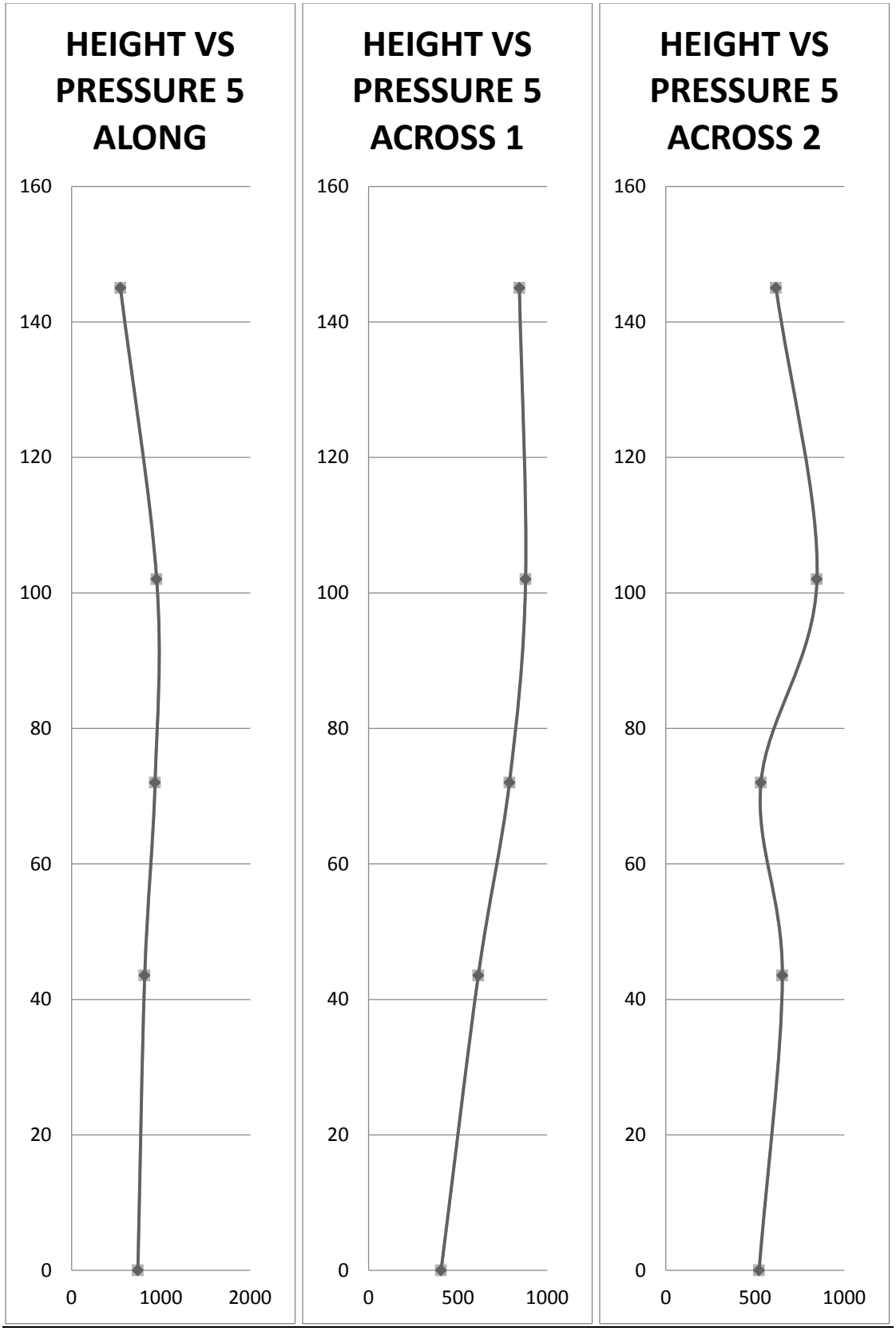
HEIGHT VS PRESSURE 5 ALONG
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120
100
80
60
40
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0
0
1000
2000
HEIGHT VS PRESSURE 5 ACROSS 1
160
140
120
100
80
60
40
20
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HEIGHT VS PRESSURE 5 ACROSS 2
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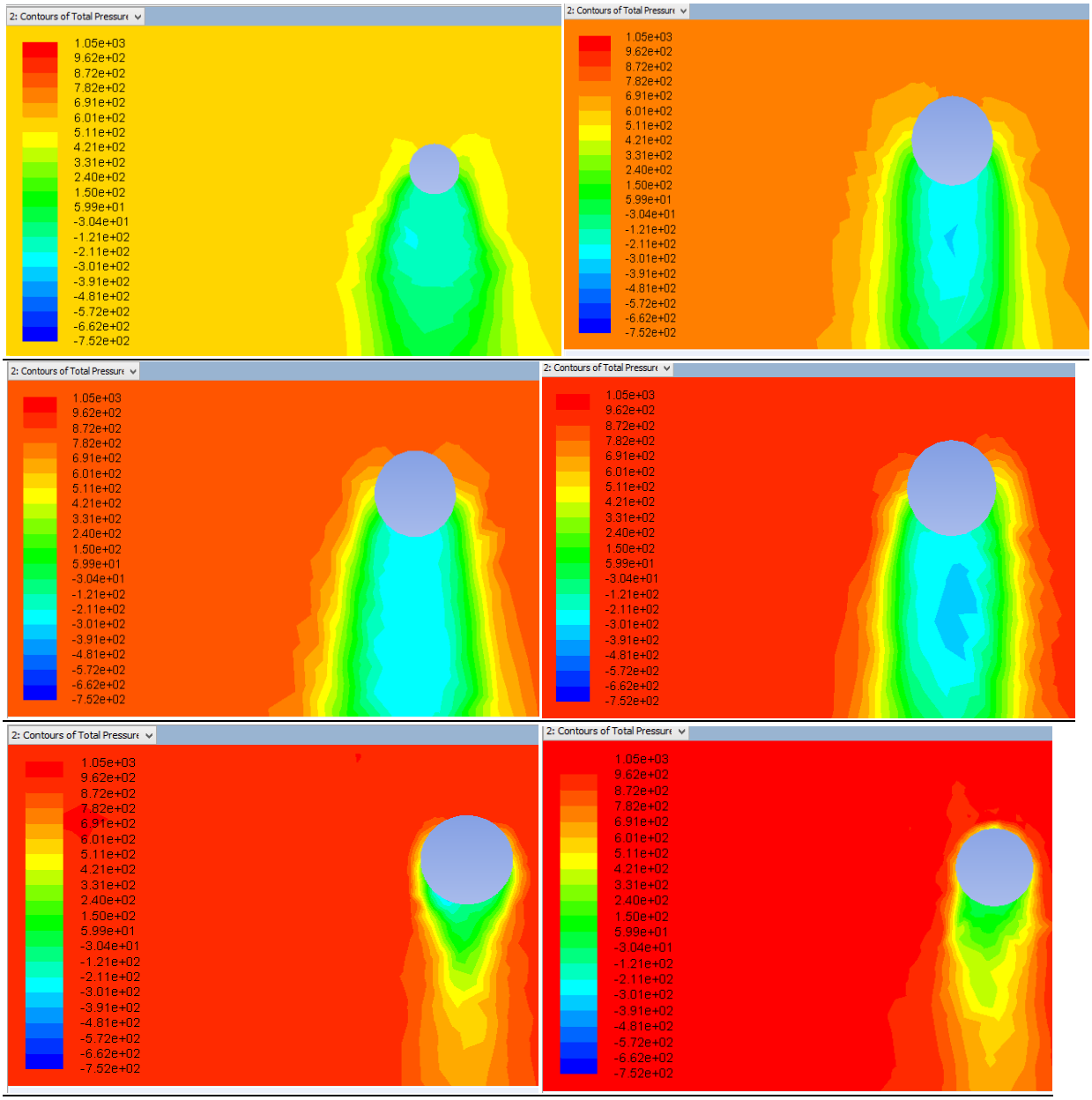
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7.82e+02
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6.01e+02
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3.31e+02
2.40e+02
1.50e+02
5.99e+01
-3.04e+01
-1.21e+02
-2.11e+02
-3.01e+02
-3.91e+02
-4.81e+02
-5.72e+02
-6.62e+02
-7.52e+02

vb - Microsoft Excel

Home | Insert | Page Layout | Formulas | Data | Review | View

Cut | Copy | Format Painter | Paste | Clipboard

Calibri | 11 | Font

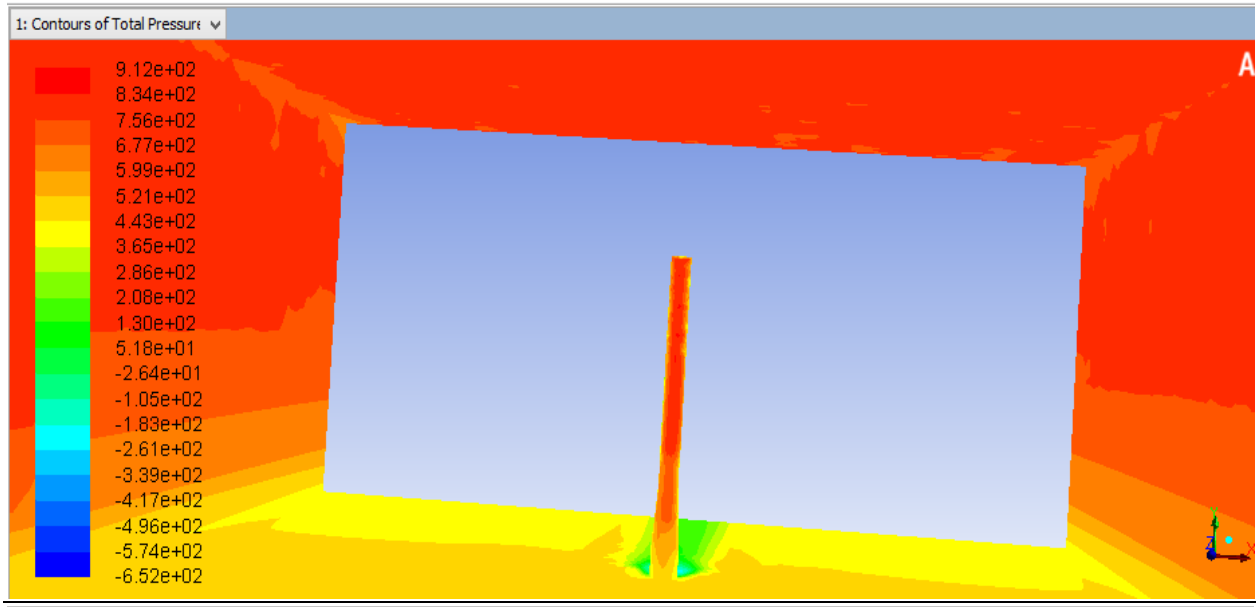
Wrap Text | Merge & Center | Alignment

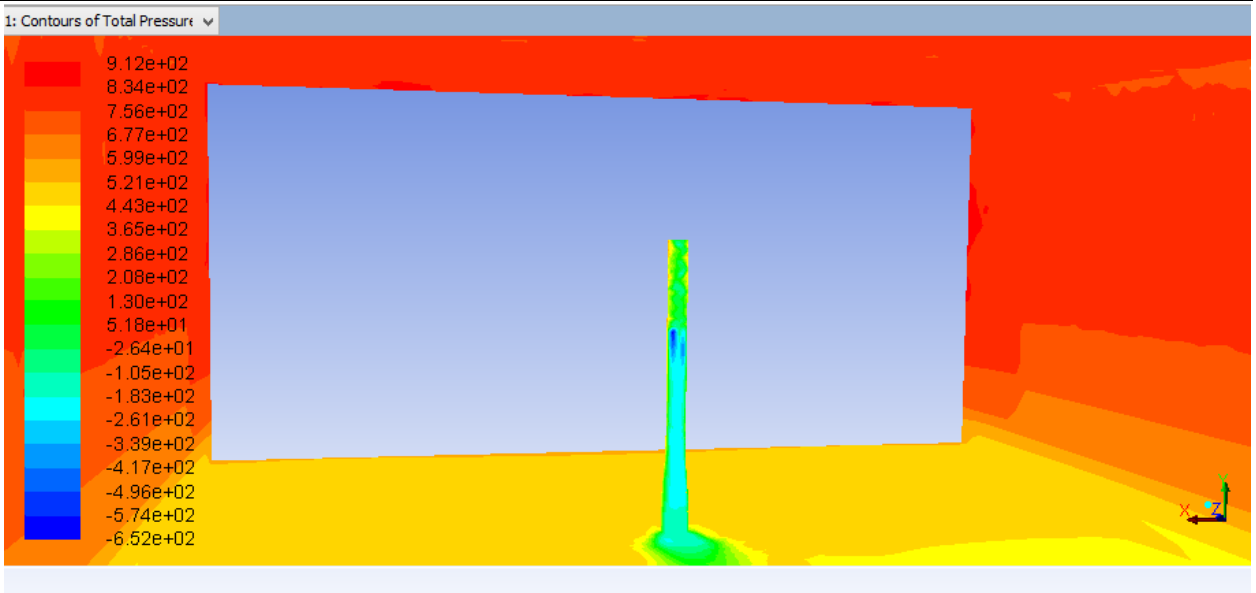
General | Number

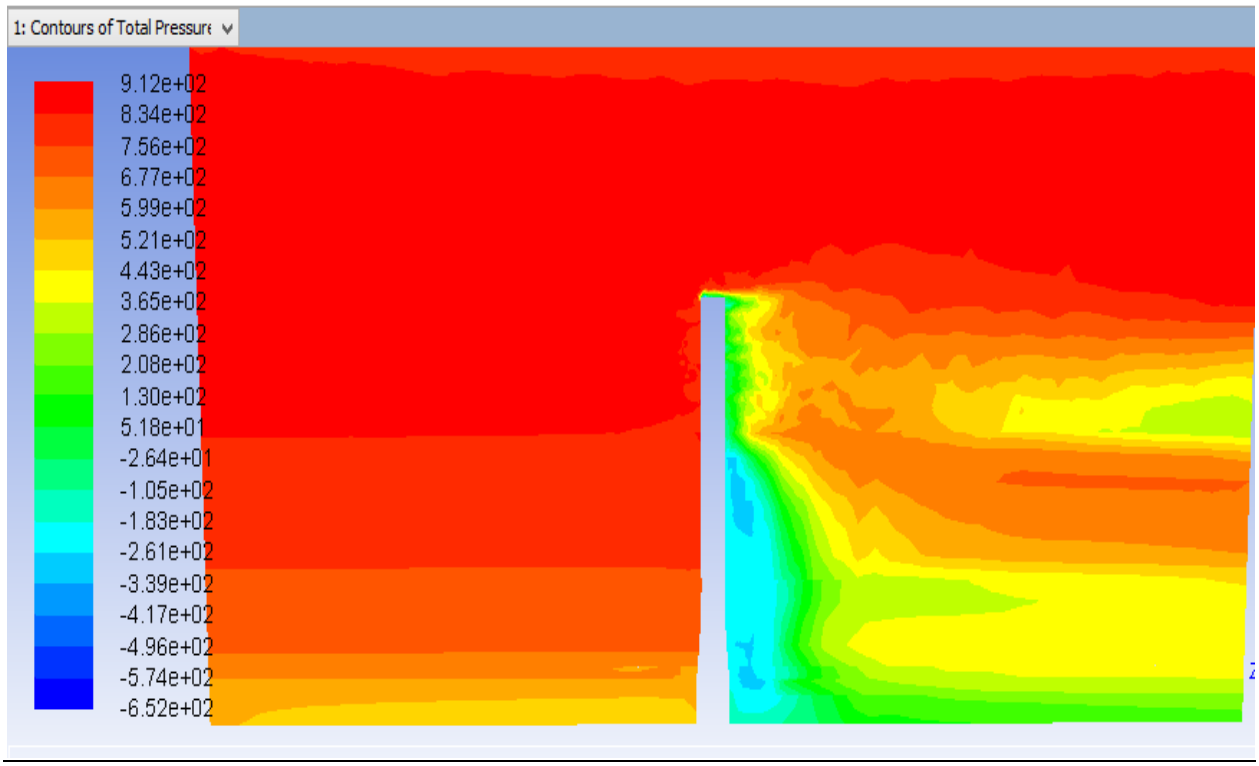
Conditional Formatting | Format as Table | Normal | Bad | Good | Neutral | Styles

J1 | v6

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34	
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716	
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6	
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01	
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695	
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9	
8																	






1: Contours of Total Pressure
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7.56e+02
6.77e+02
5.99e+02
5.21e+02
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3.65e+02
2.86e+02
2.08e+02
1.30e+02
5.18e+01
-2.64e+01
-1.05e+02
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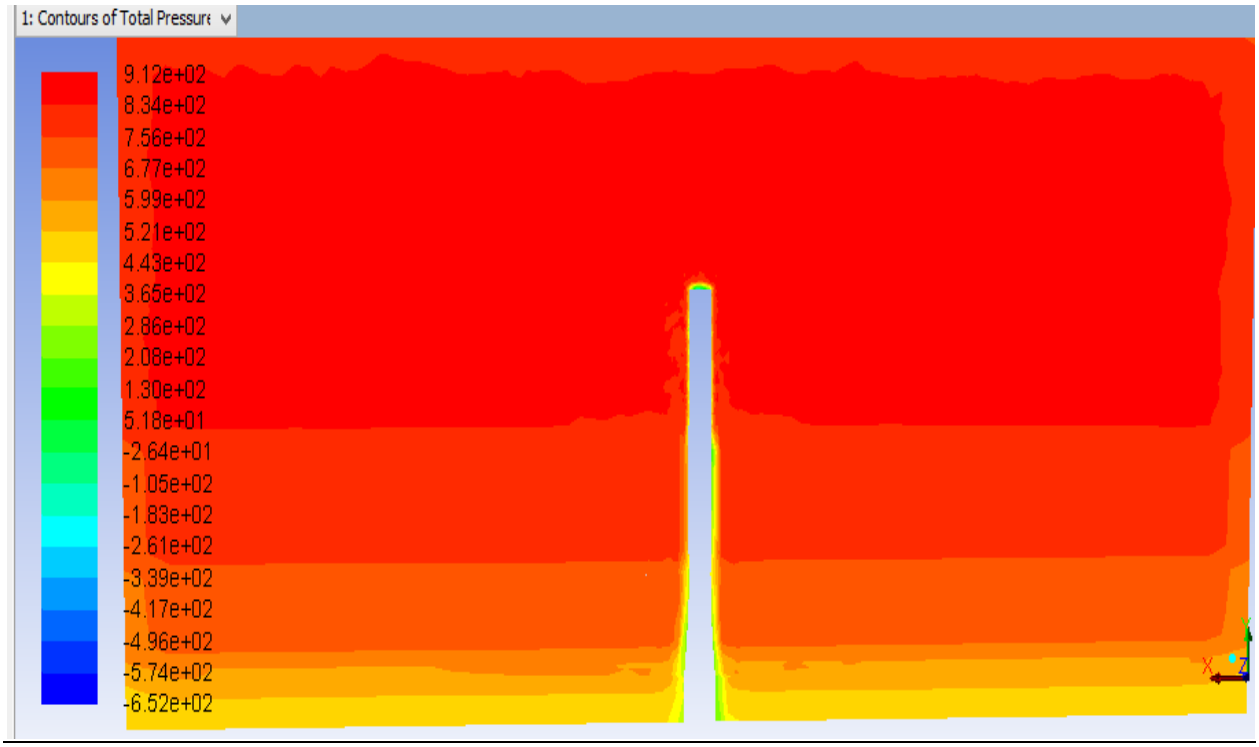
-5.74e+02
-6.52e+02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7.56e+02
6.77e+02
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5.21e+02
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3.65e+02
2.86e+02
2.08e+02
1.30e+02
5.18e+01
-2.64e+01
-1.05e+02
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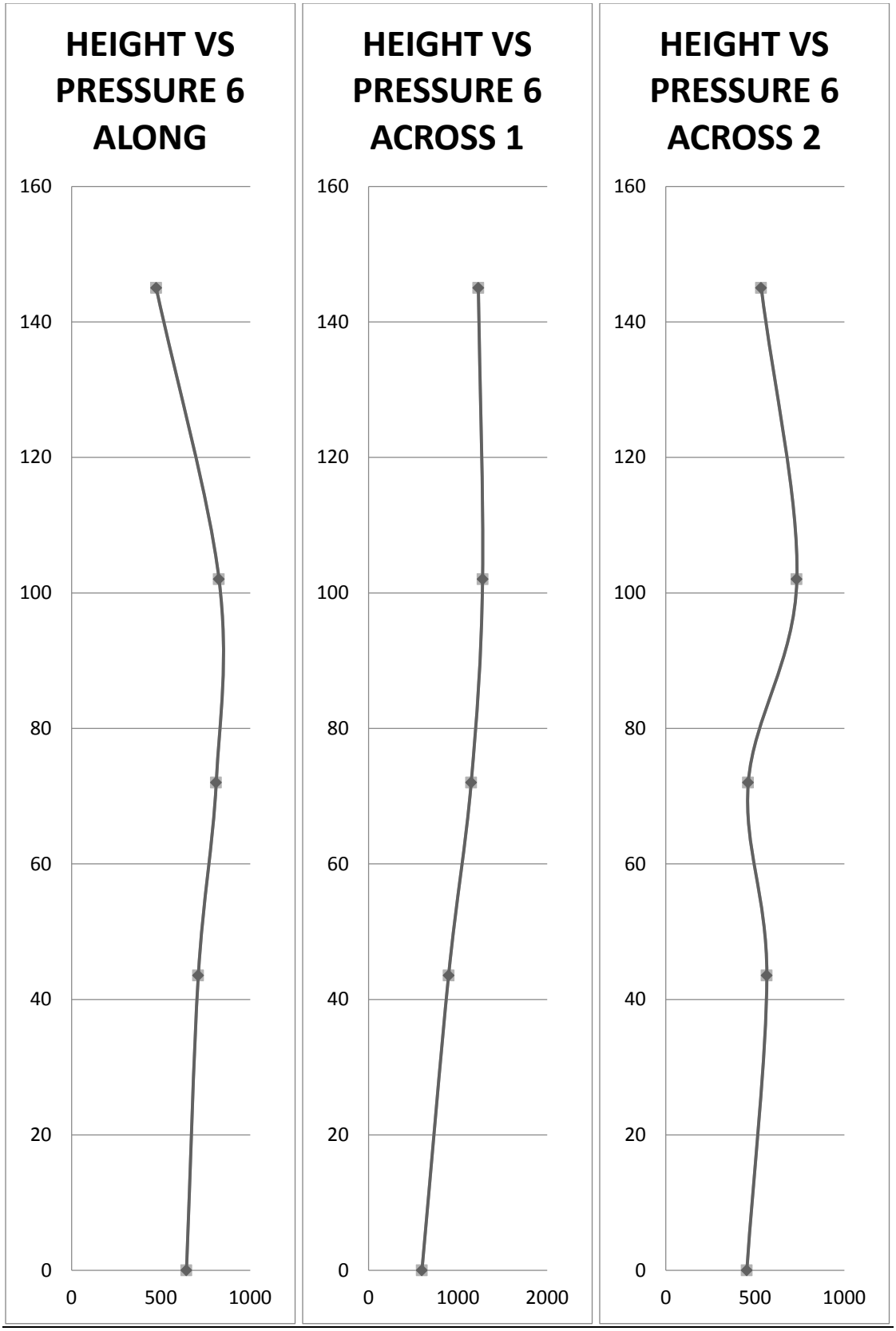
-6.52e+02


HEIGHT VS PRESSURE 6 ALONG
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40
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0
500
1000
HEIGHT VS PRESSURE 6 ACROSS 1
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140
120
100
80
60
40
20
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0
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HEIGHT VS PRESSURE 6 ACROSS 2
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120
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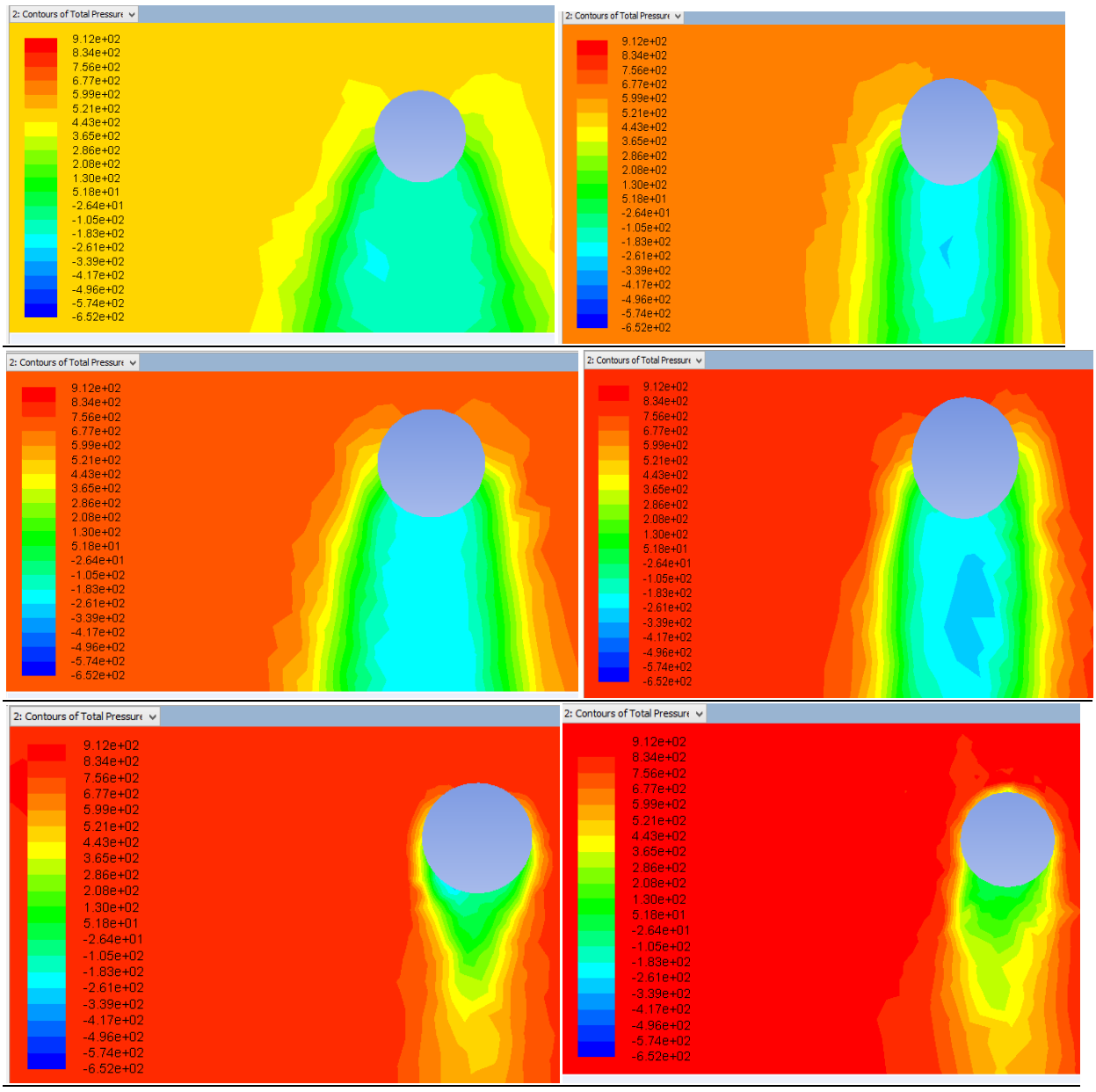
80
60
40
20
0
0
500
1000


2: Contours of Total Pressure
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7.56e+02
6.77e+02
5.99e+02
5.21e+02
4.43e+02
3.65e+02
2.86e+02
2.08e+02
1.30e+02
5.18e+01
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-1.05e+02
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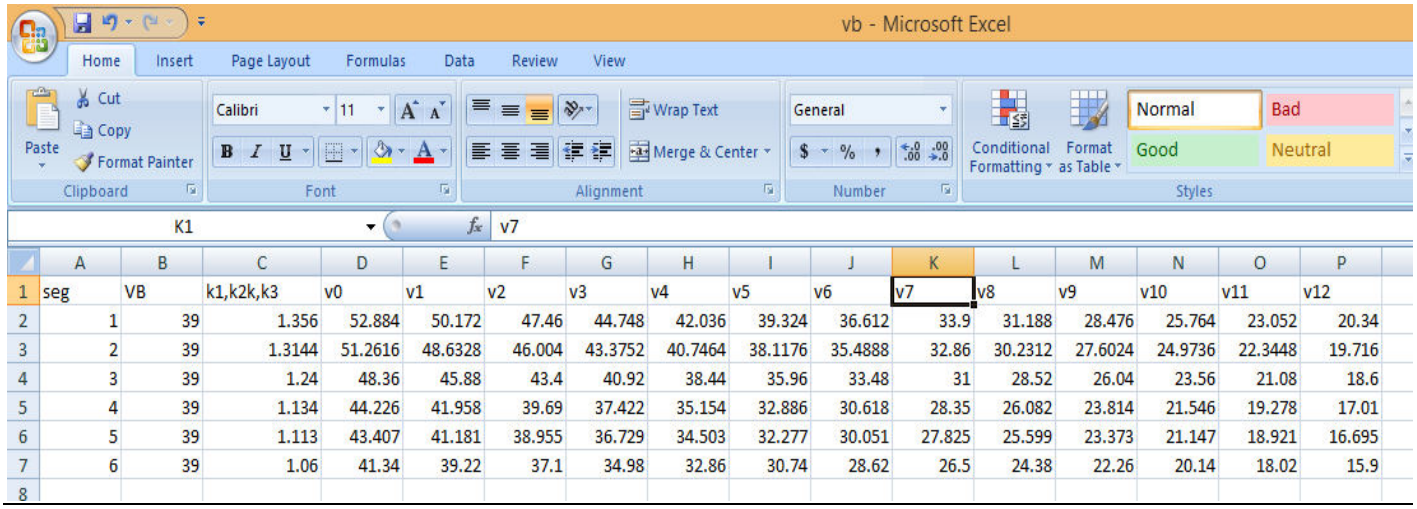
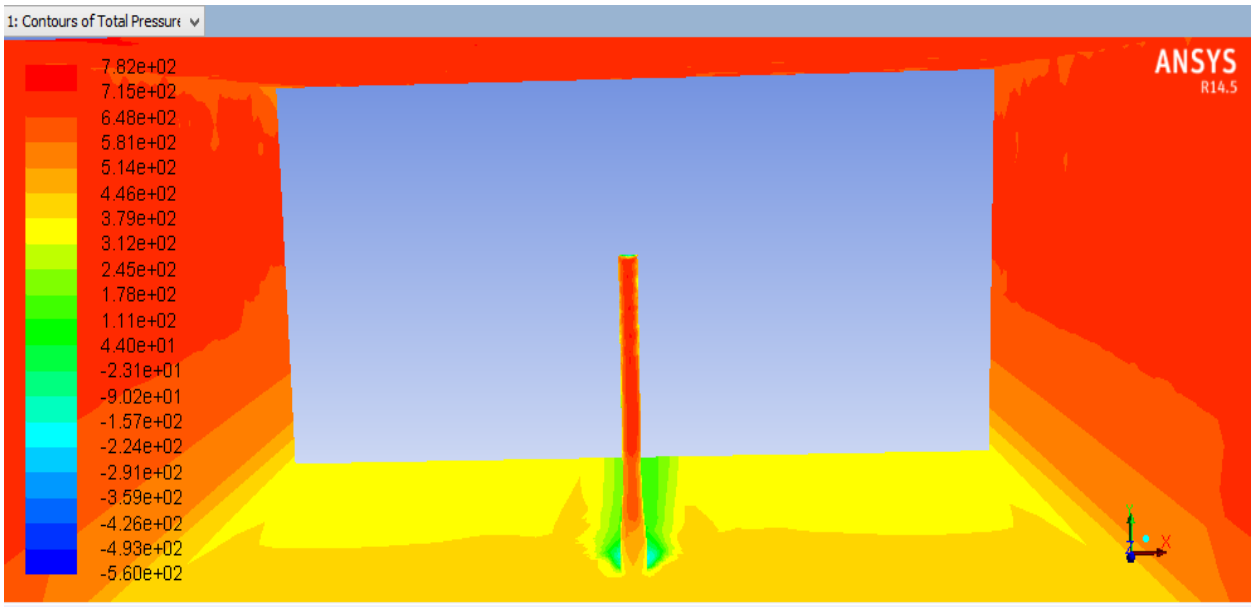
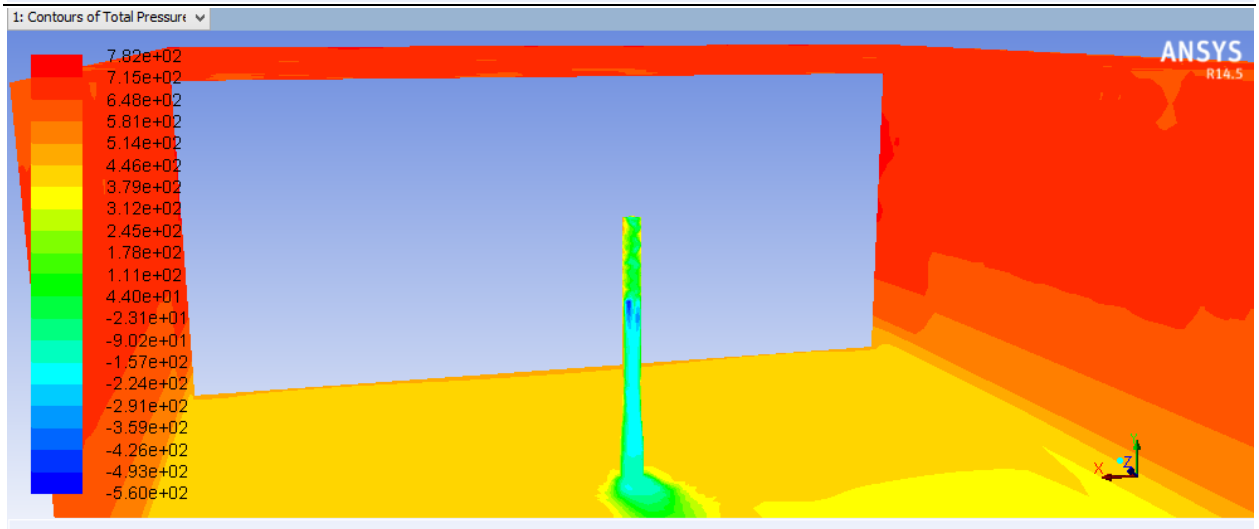
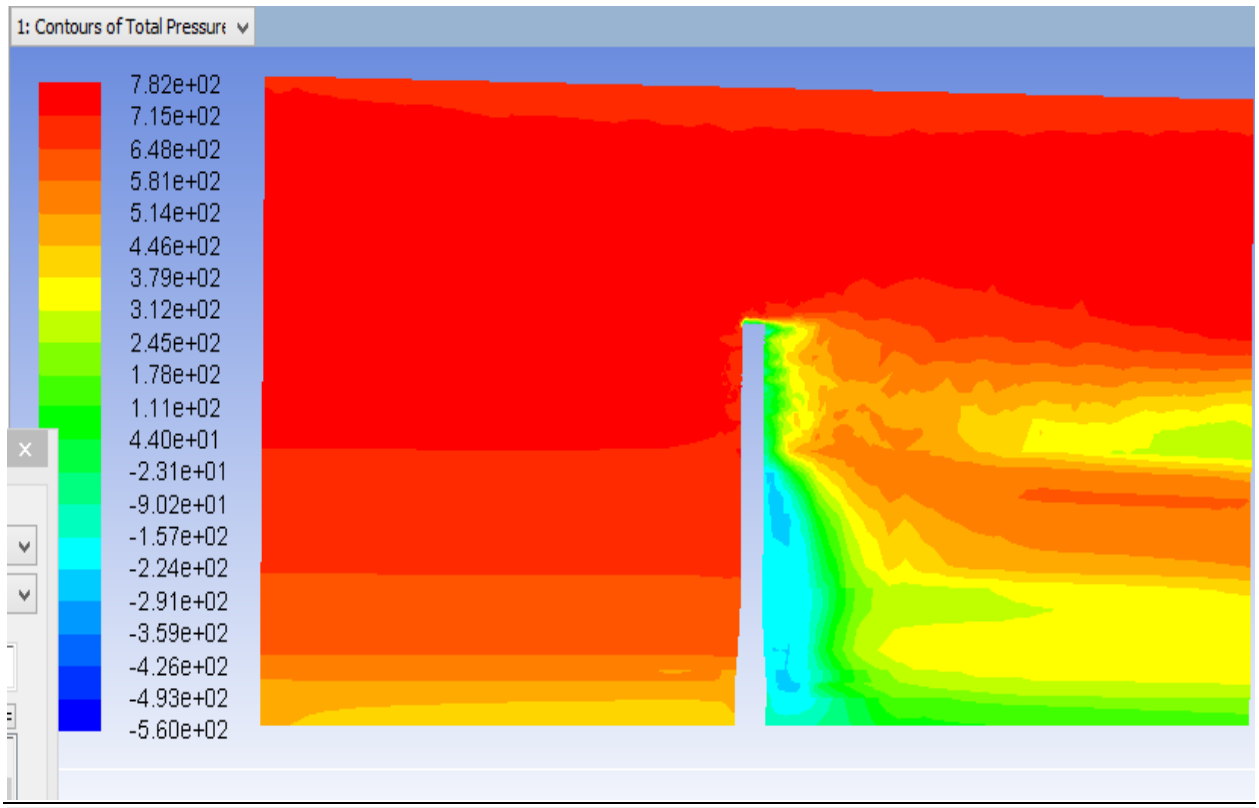


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																






1: Contours of Total Pressure
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7.15e+02
6.48e+02
5.81e+02
5.14e+02
4.46e+02
3.79e+02
3.12e+02
2.45e+02
1.78e+02
1.11e+02
4.40e+01
-2.31e+01
-9.02e+01
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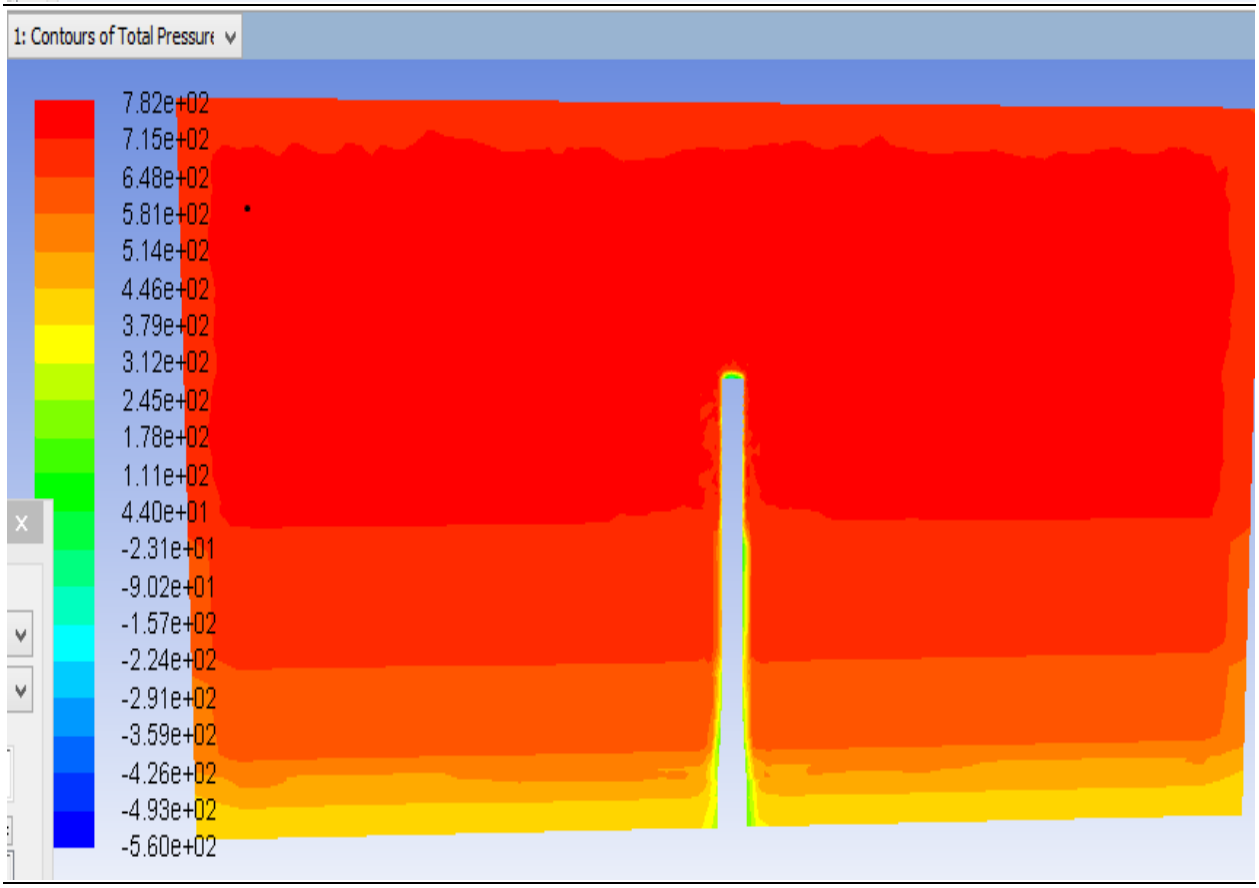
-3.59e+02
-4.26e+02
-4.93e+02
-5.60e+02


1: Contours of Total Pressure
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7.15e+02
6.48e+02
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3.12e+02
2.45e+02
1.78e+02
1.11e+02
4.40e+01
-2.31e+01
-9.02e+01
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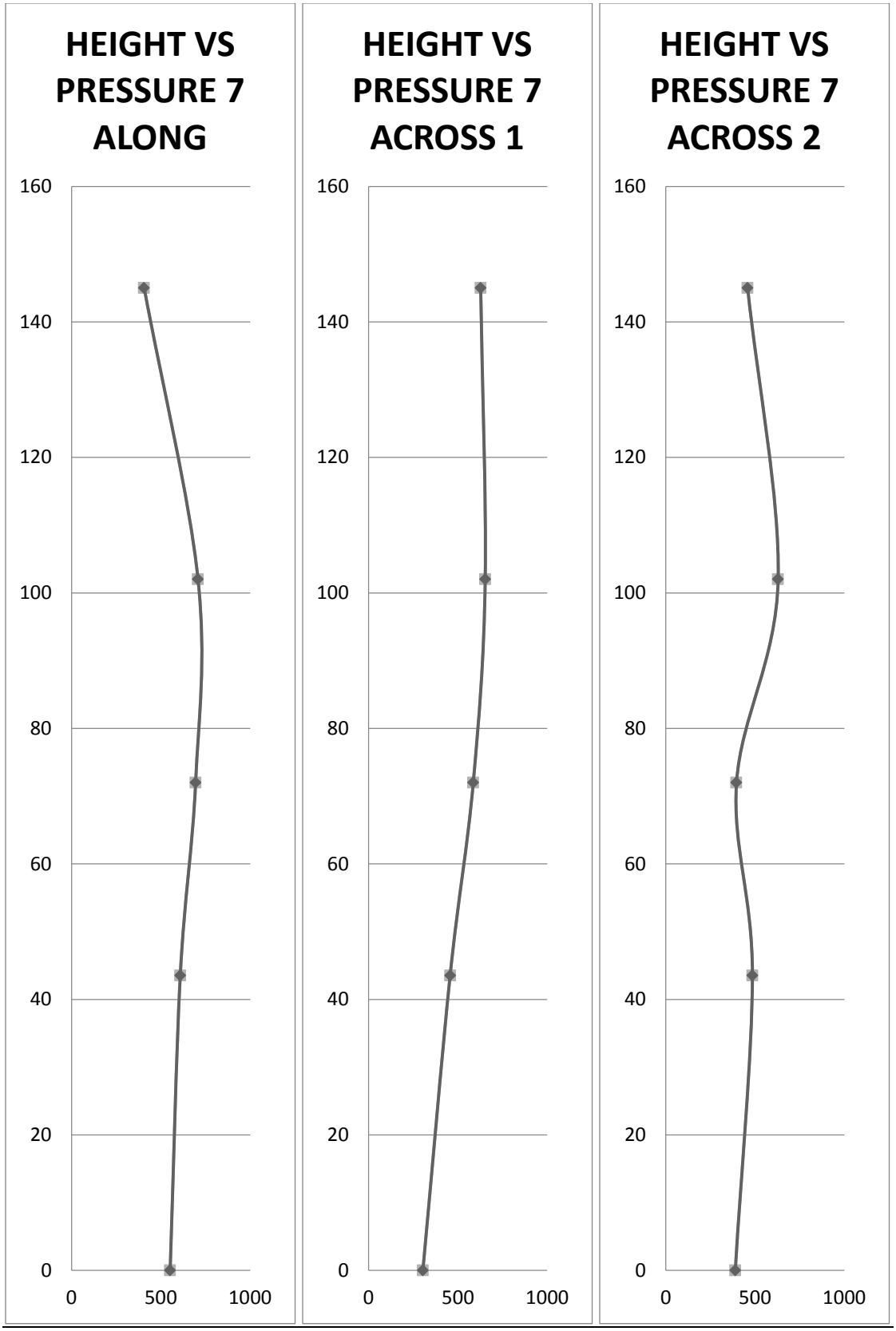
HEIGHT VS PRESSURE 7 ALONG
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HEIGHT VS PRESSURE 7 ACROSS 1
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80
60
40
20
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HEIGHT VS PRESSURE 7 ACROSS 2
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140
120
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80
60
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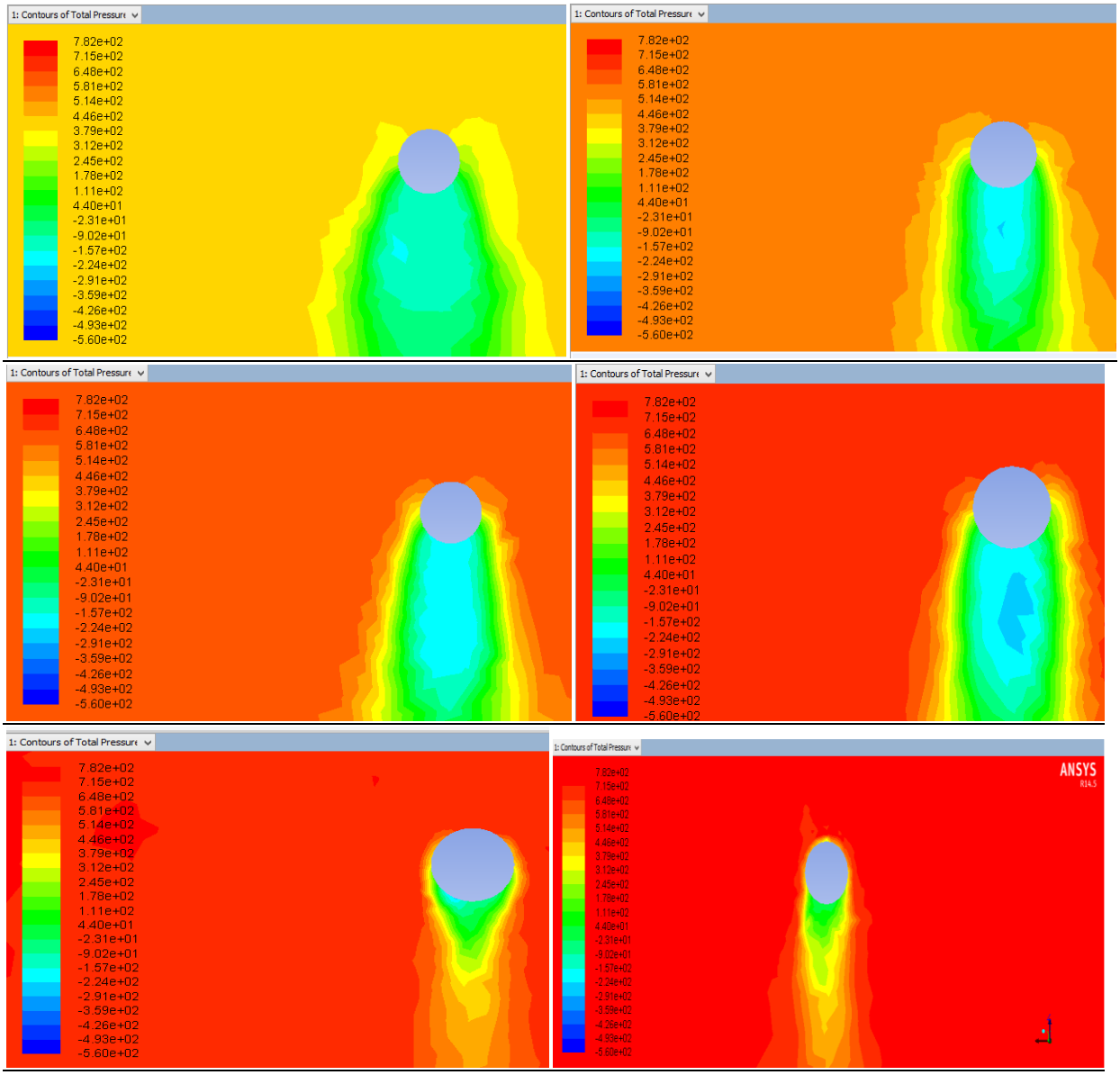

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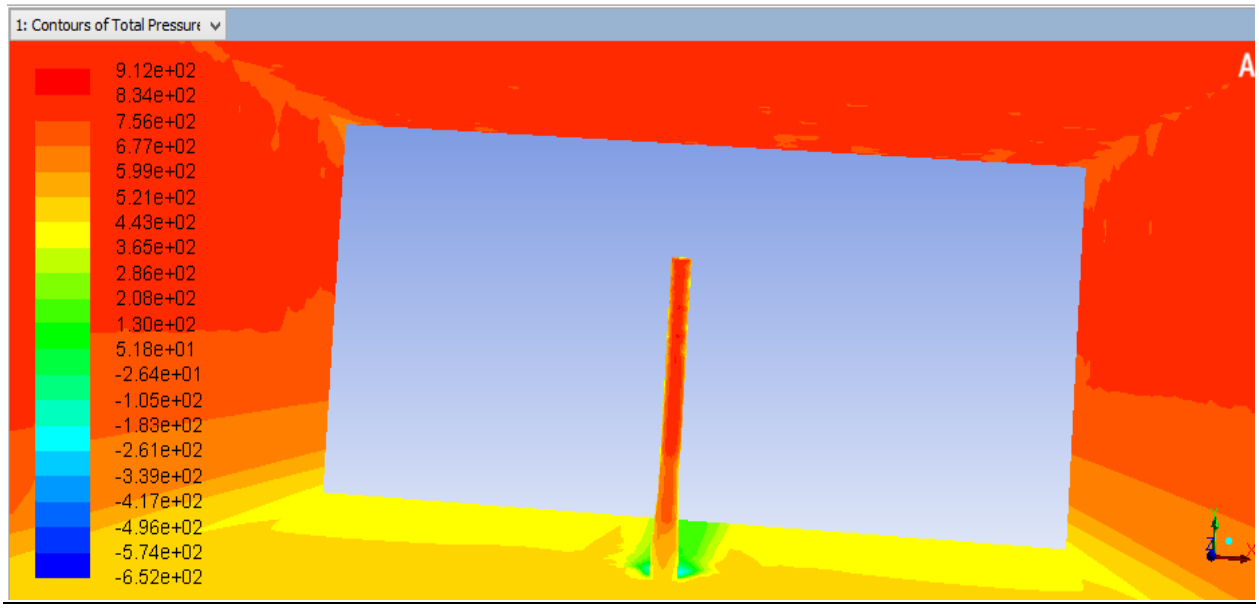
Home | Insert | Page Layout | Formulas | Data | Review | View

Paste | Cut | Copy | Format Painter | Clipboard | Calibri | 11 | Font | Wrap Text | Merge & Center | Alignment | General | Number | Conditional Formatting | Format as Table | Normal | Bad | Good | Neutral | Styles

L1 | v8

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9


1: Contours of Total Pressure
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8.34e+02
7.56e+02
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5.21e+02
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3.65e+02
2.86e+02
2.08e+02
1.30e+02
5.18e+01
-2.64e+01
-1.05e+02
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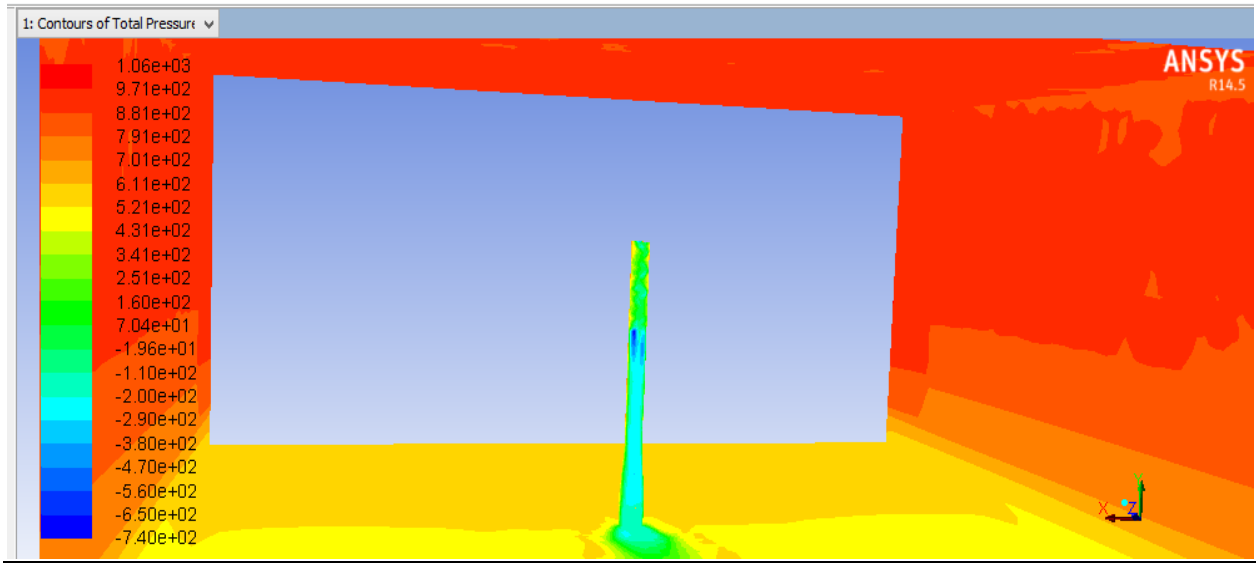
-5.74e+02
-6.52e+02


1: Contours of Total Pressure
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8.81e+02
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6.11e+02
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4.31e+02
3.41e+02
2.51e+02
1.60e+02
7.04e+01
-1.96e+01
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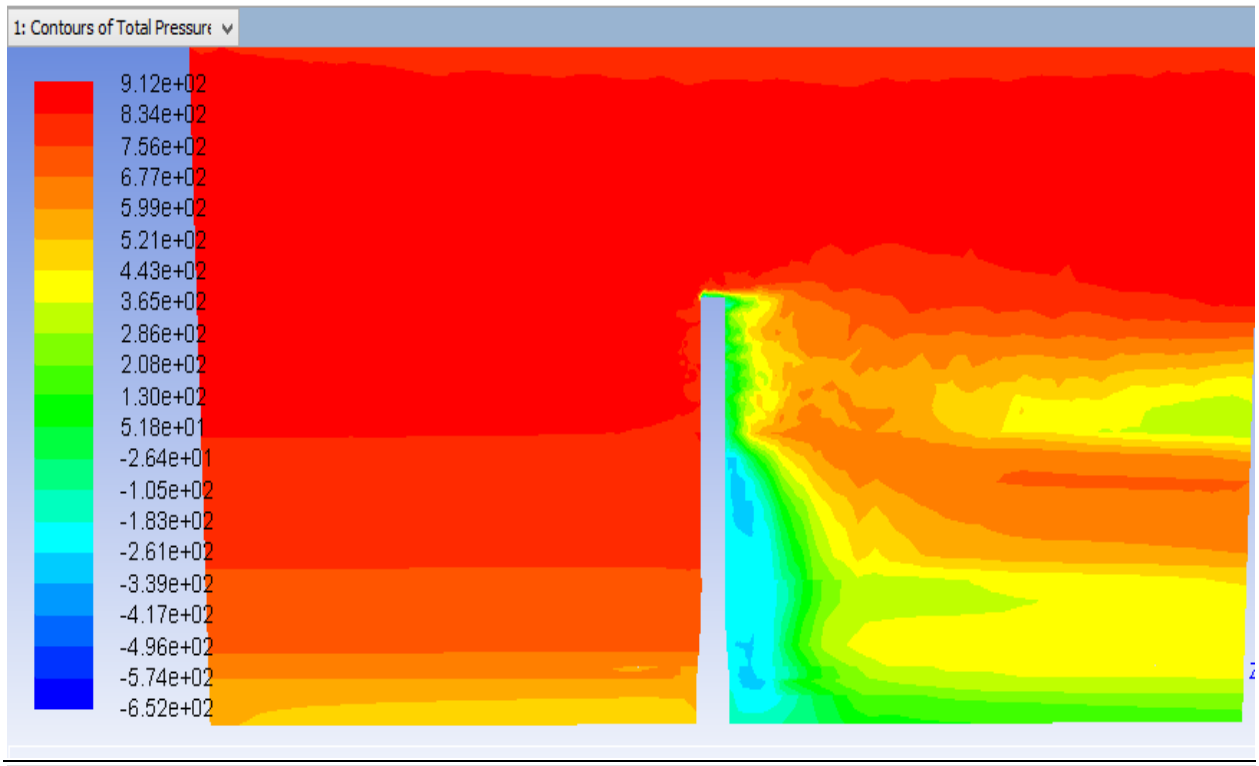
ANSYS
R14.5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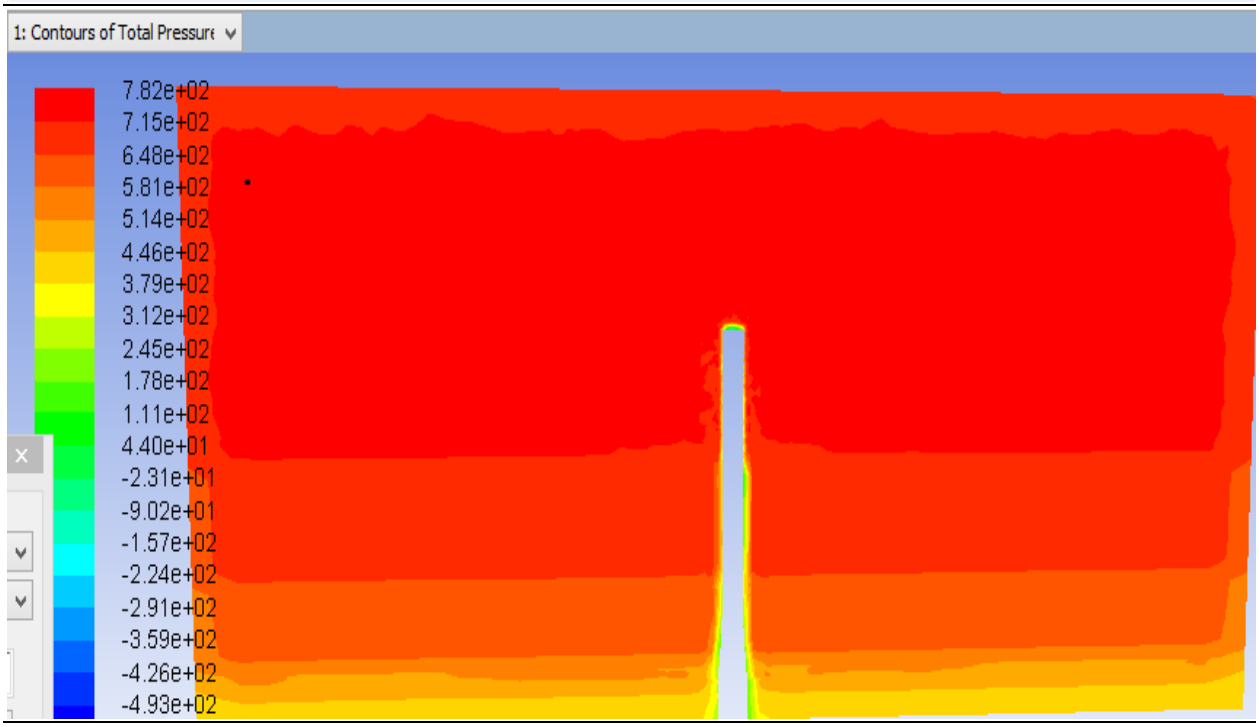
1: Contours of Total Pressure
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4.46e+02
3.79e+02
3.12e+02
2.45e+02
1.78e+02
1.11e+02
4.40e+01
-2.31e+01
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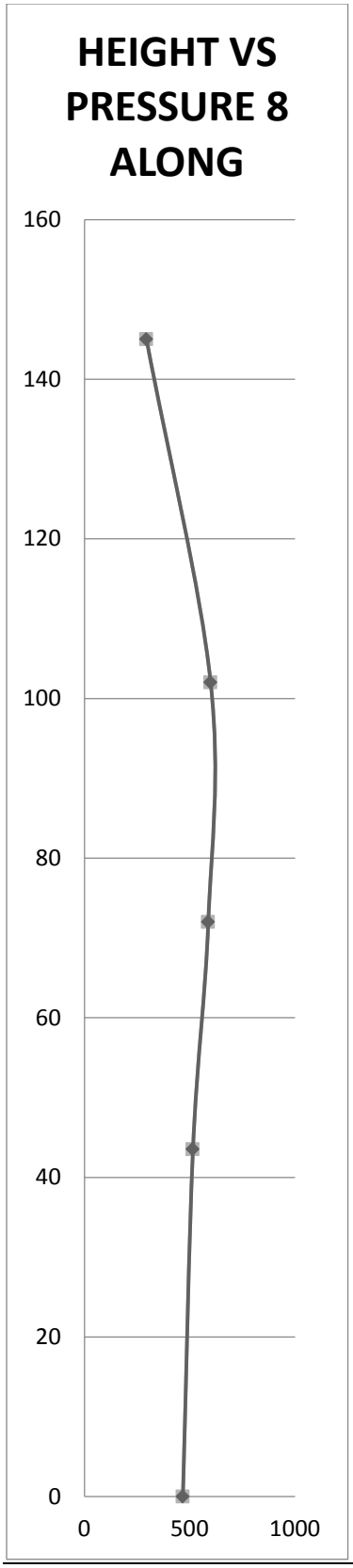
HEIGHT VS PRESSURE 8 ALONG
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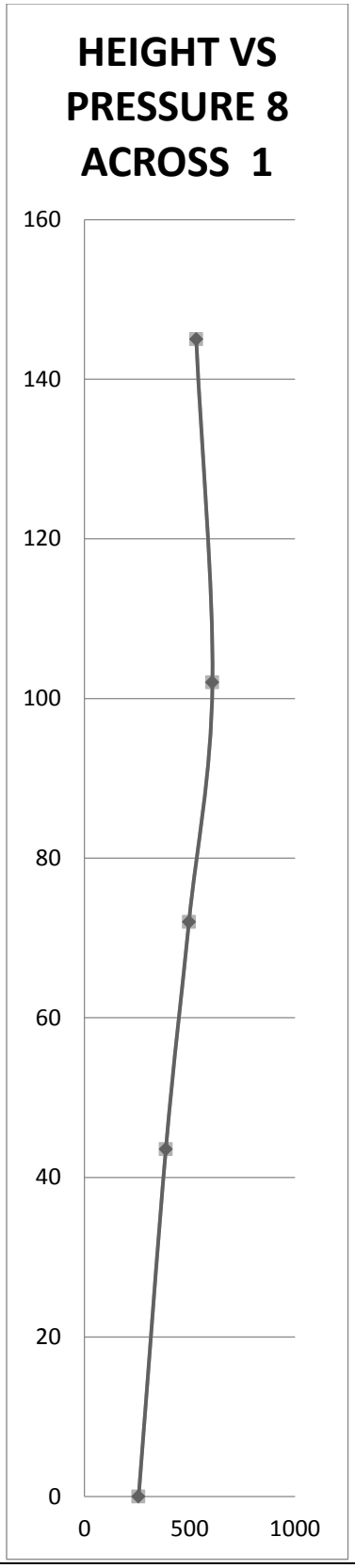
HEIGHT VS PRESSURE 8 ACROSS 1
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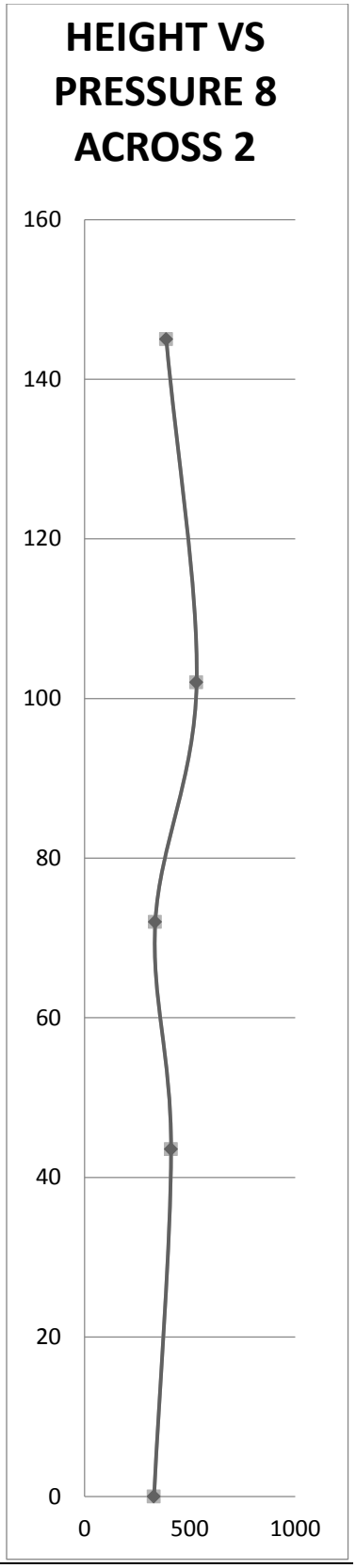
HEIGHT VS PRESSURE 8 ACROSS 2
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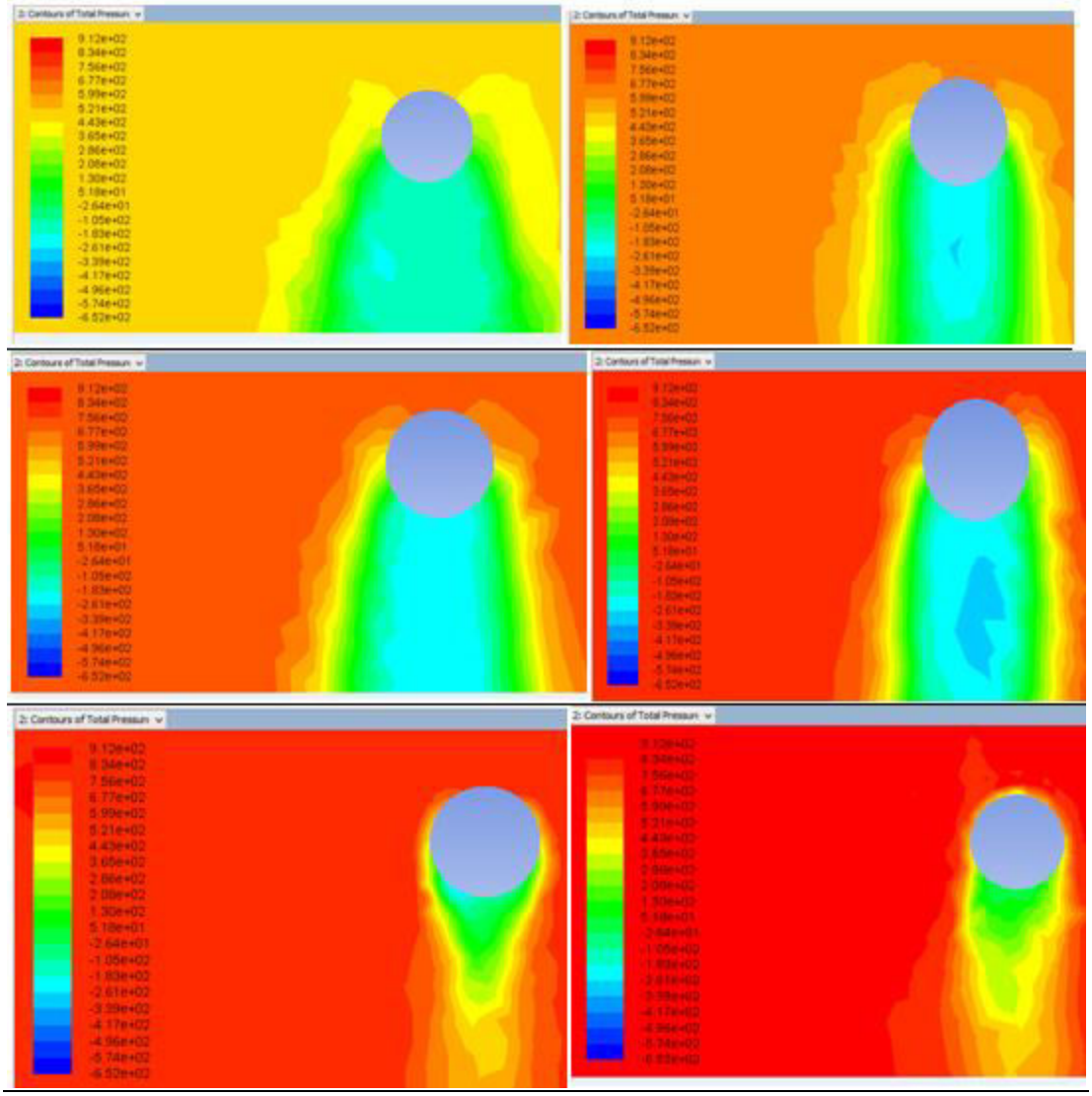


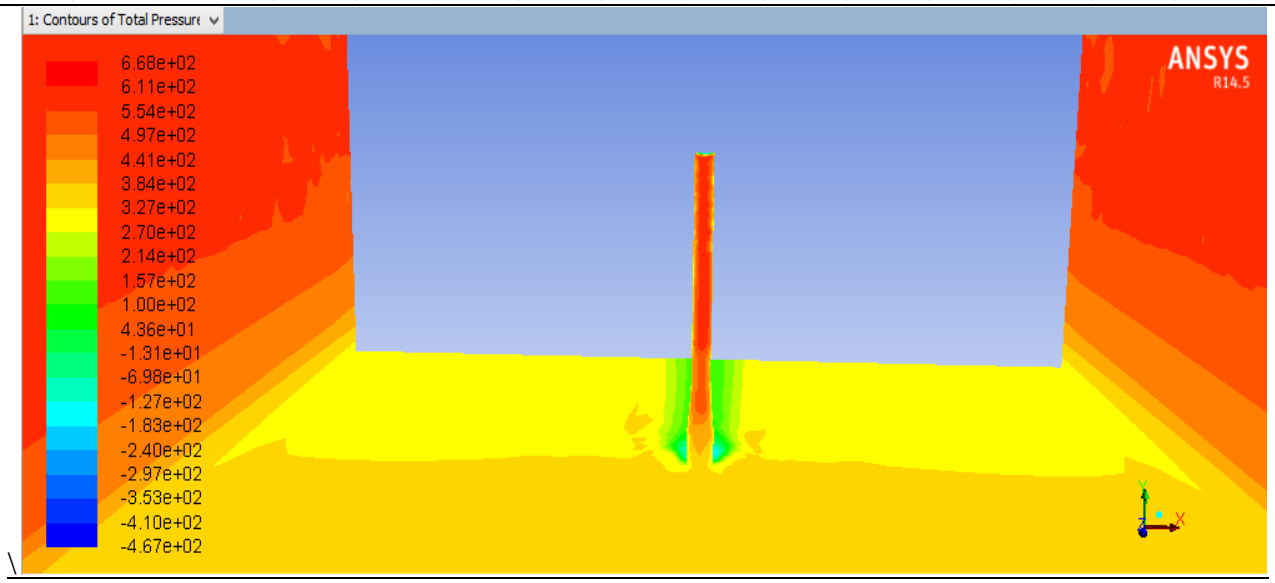
vb - Microsoft Excel

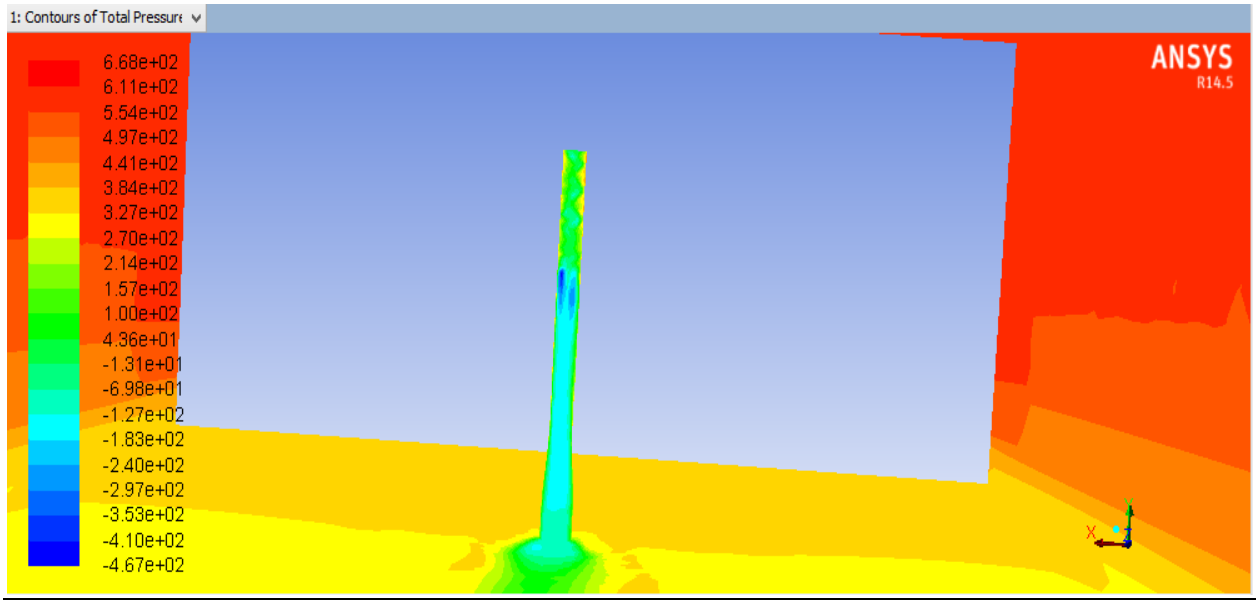
Home | Insert | Page Layout | Formulas | Data | Review | View

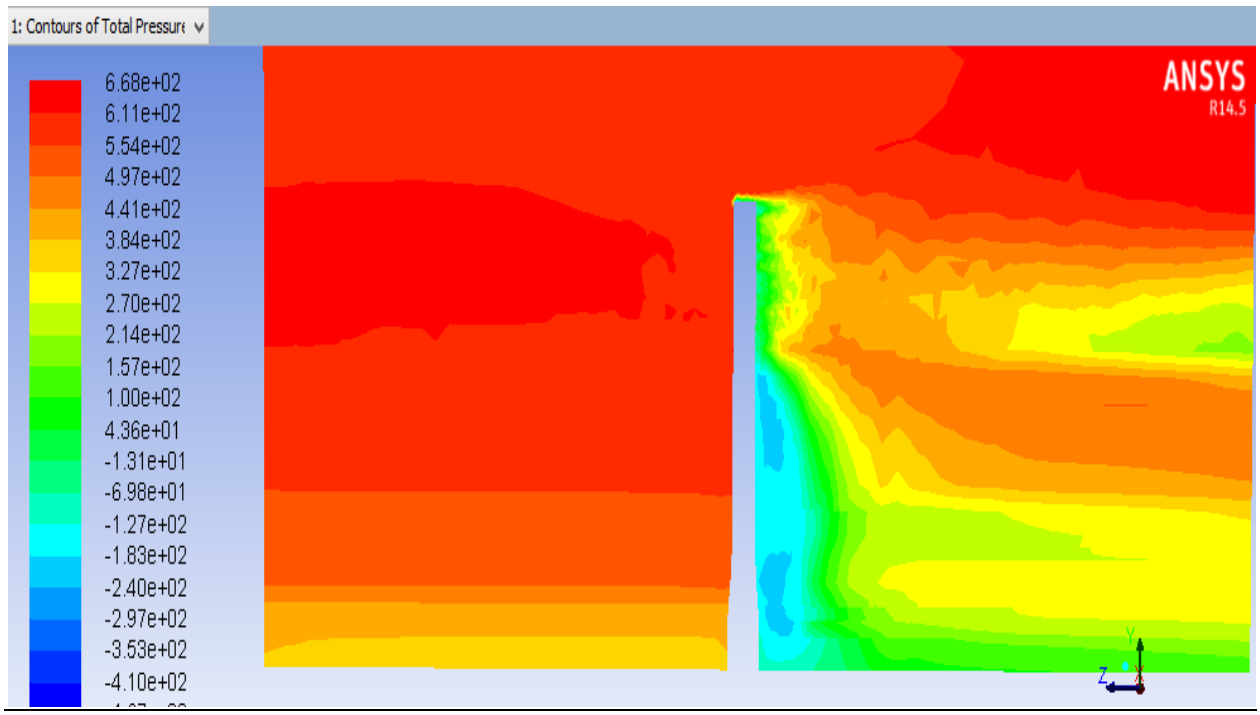
Cut | Copy | Format Painter | Paste | Clipboard | Calibri | 11 | Font | Wrap Text | Merge & Center | Alignment | General | Number | Conditional Formatting | Format as Table | Normal | Bad | Good | Neutral | Styles

M1 | v9

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																



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-1.31e+01
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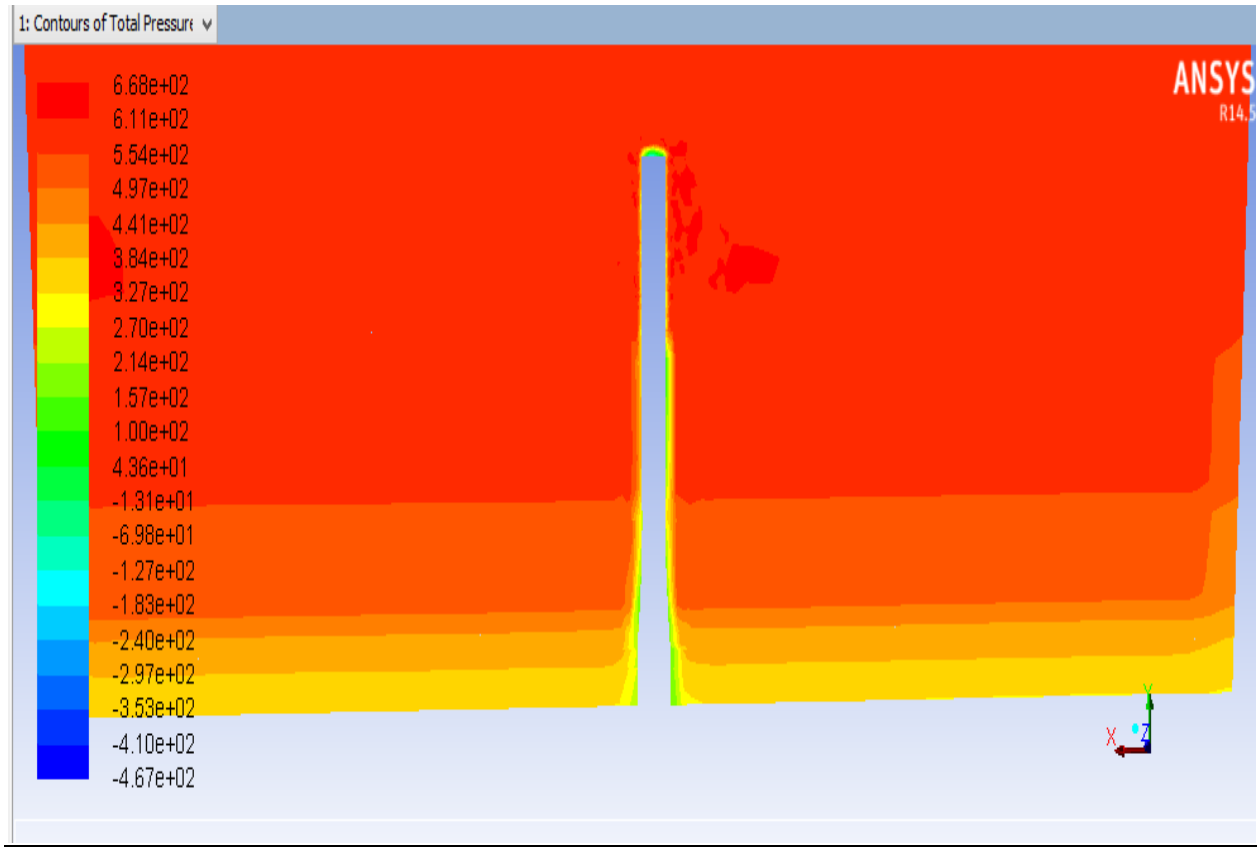
ANSYS
R14.5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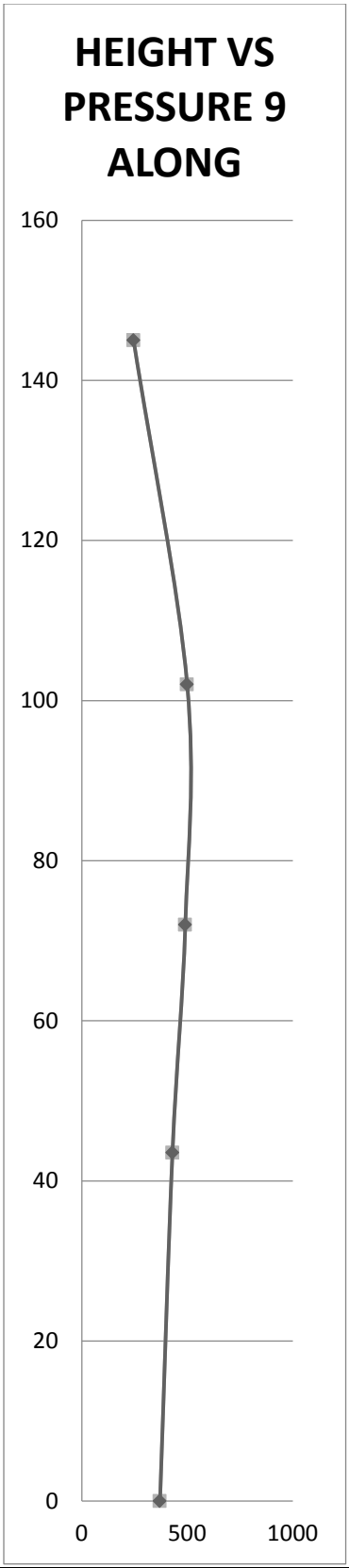
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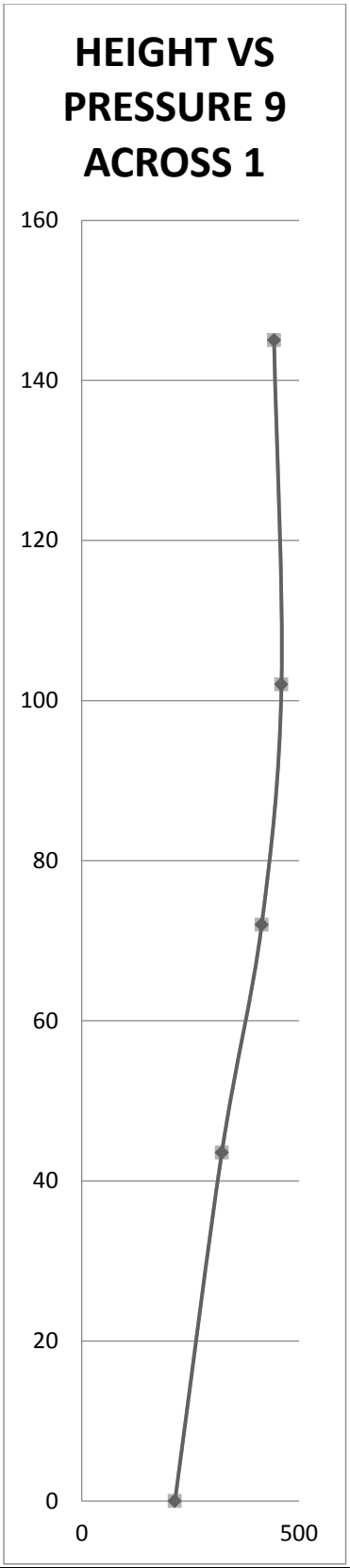
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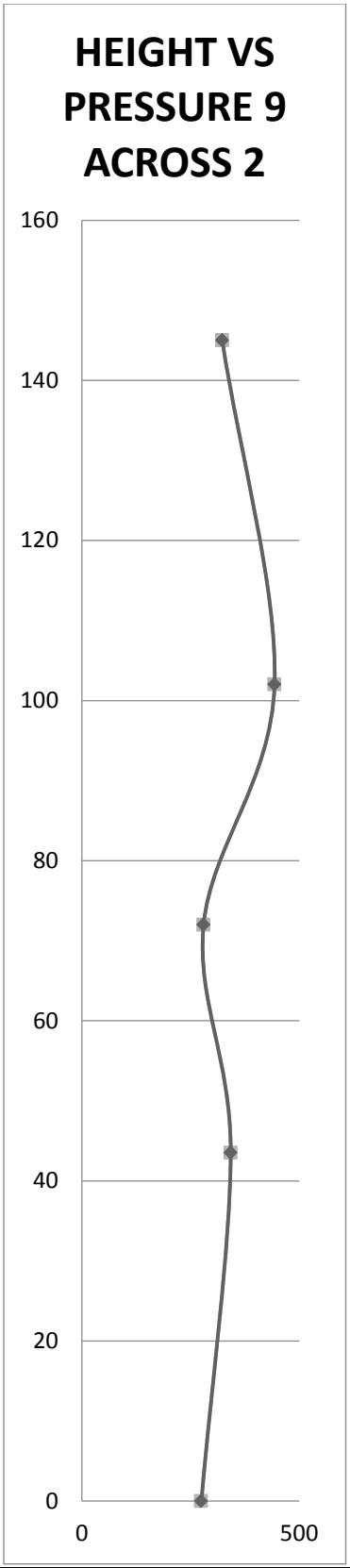
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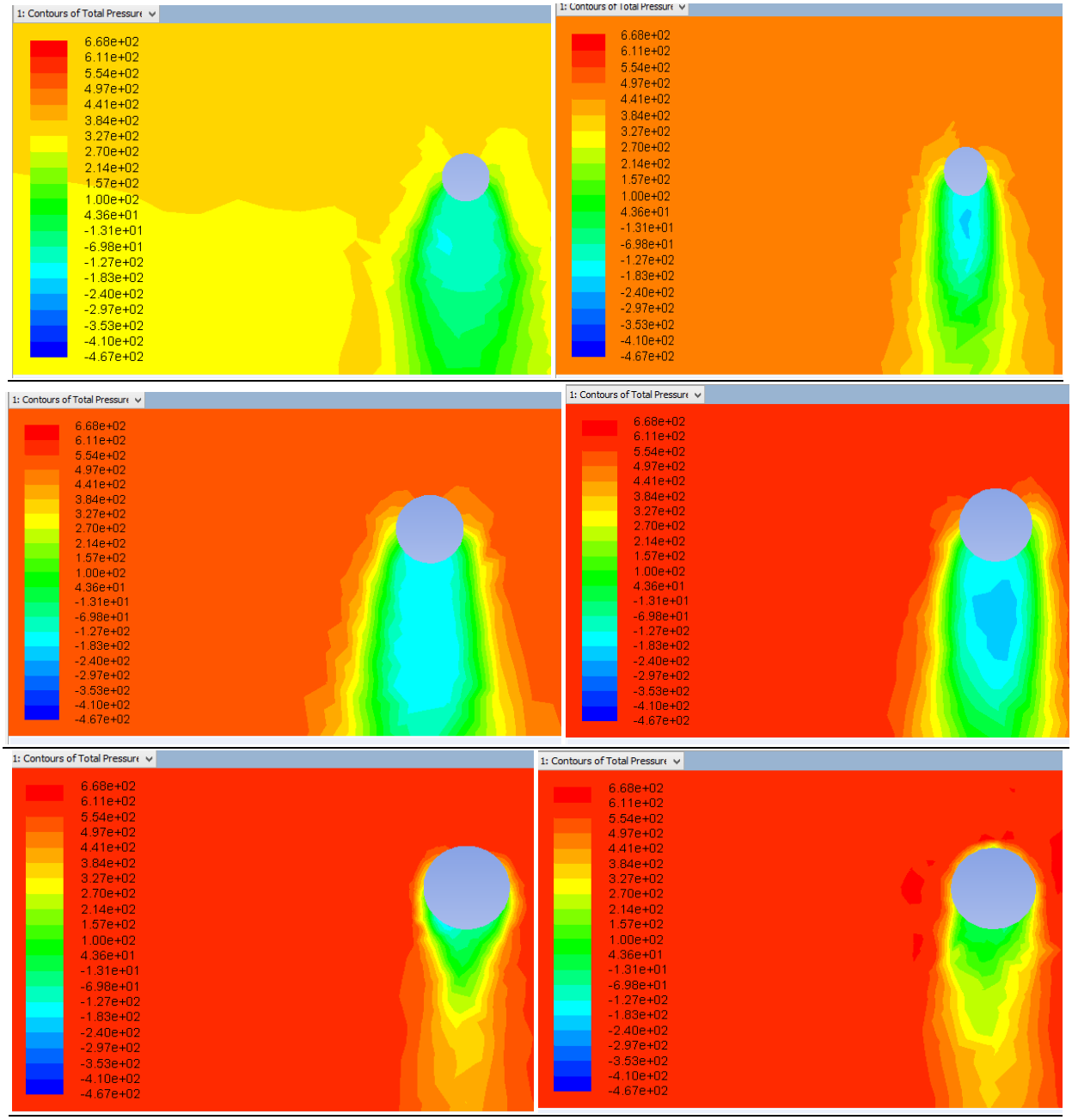
1: Contours of Total Pressure
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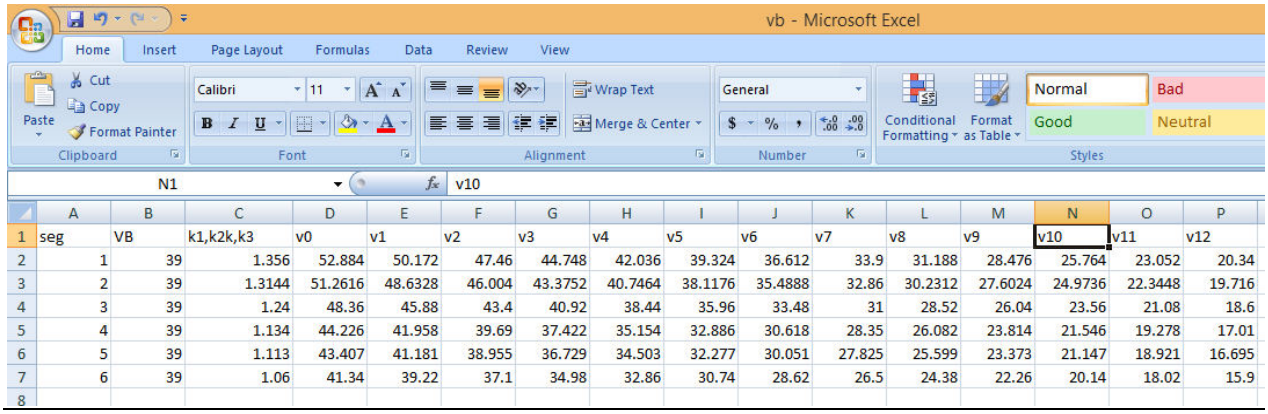

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
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2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
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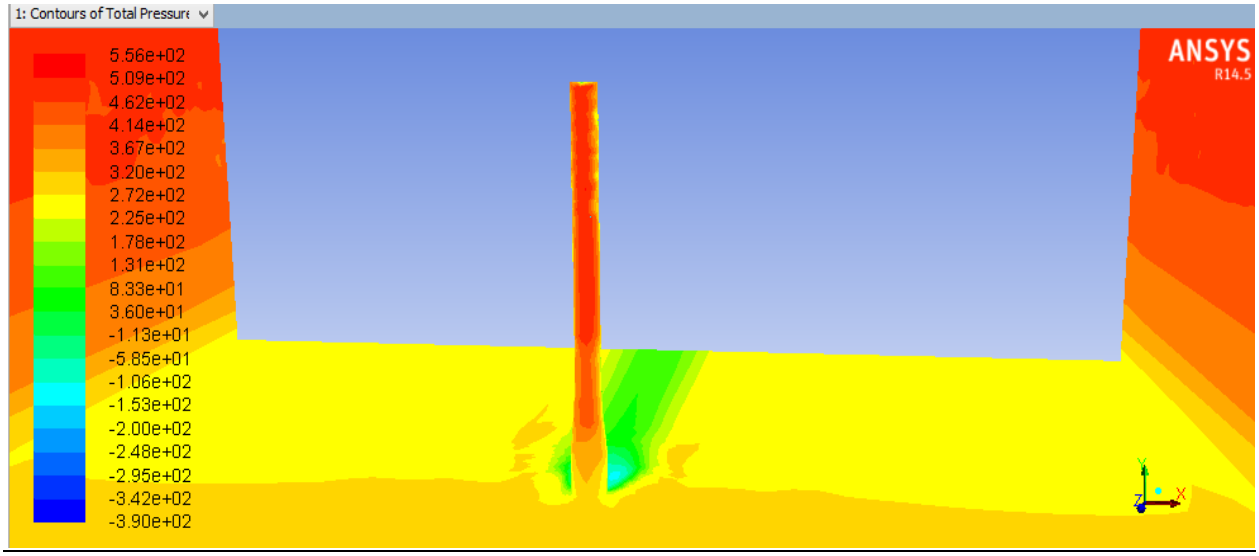

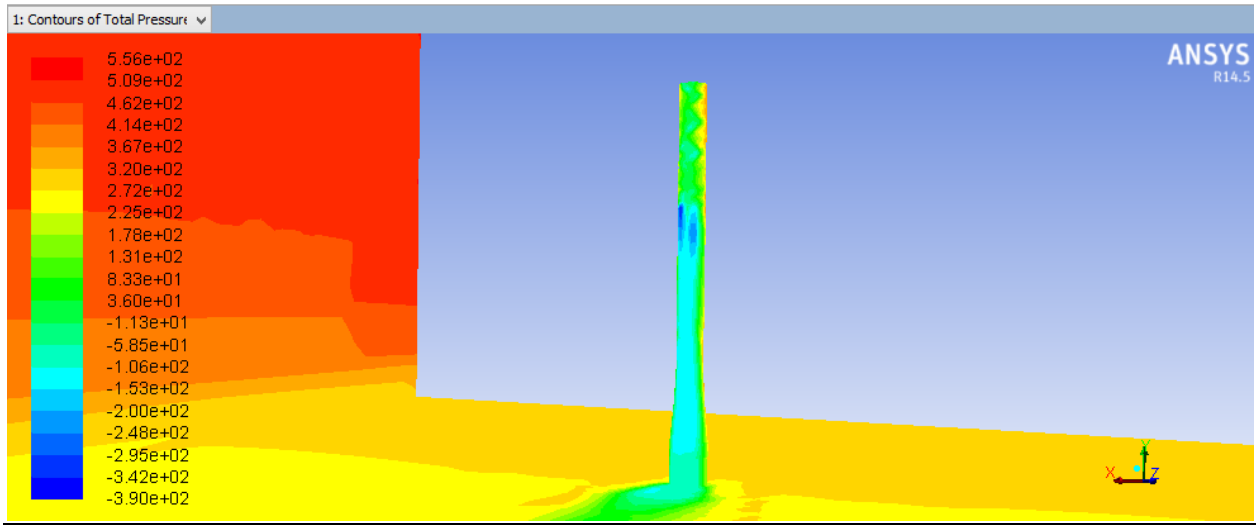

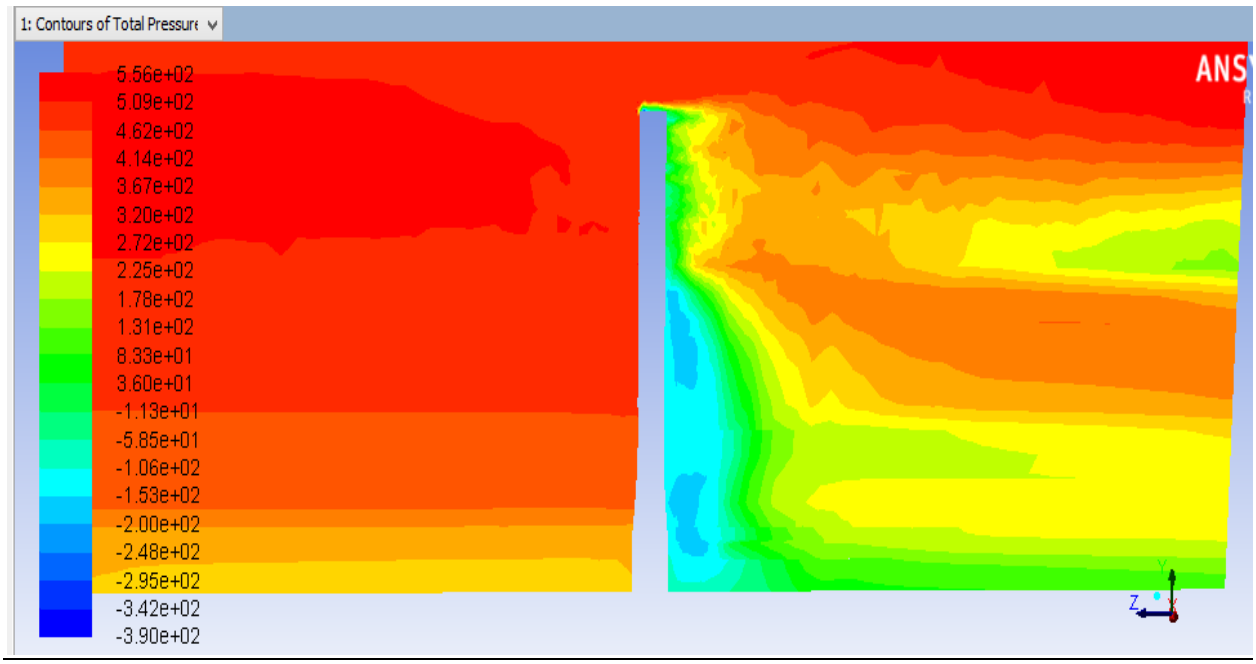
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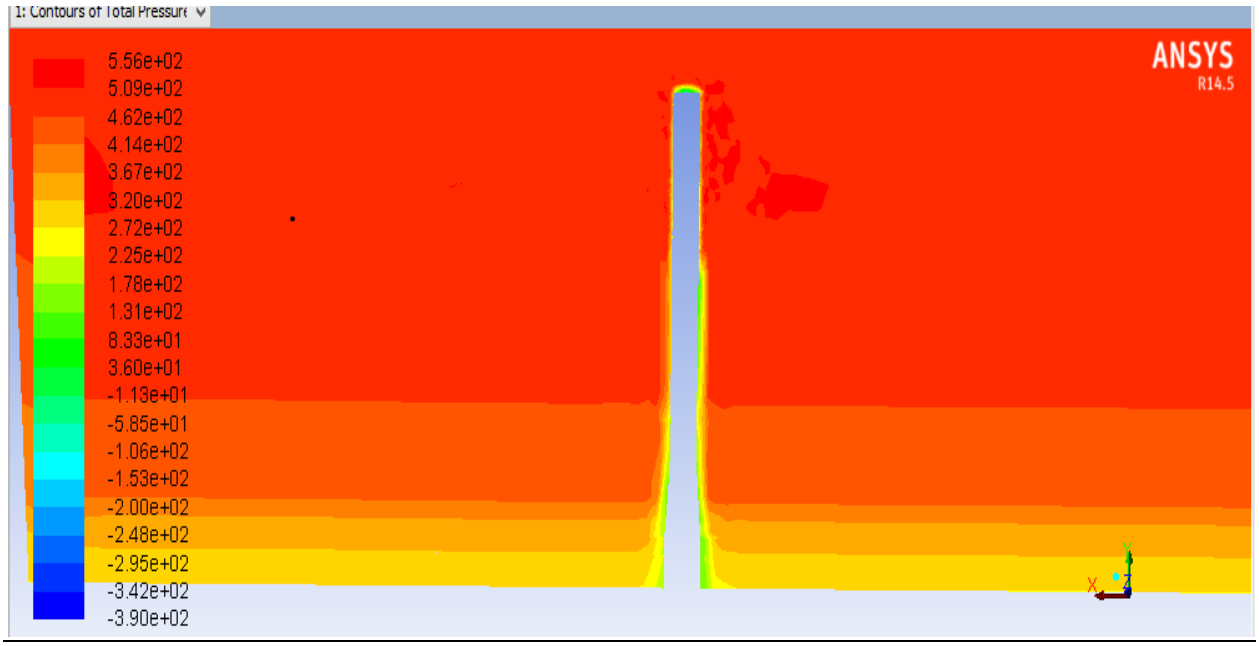
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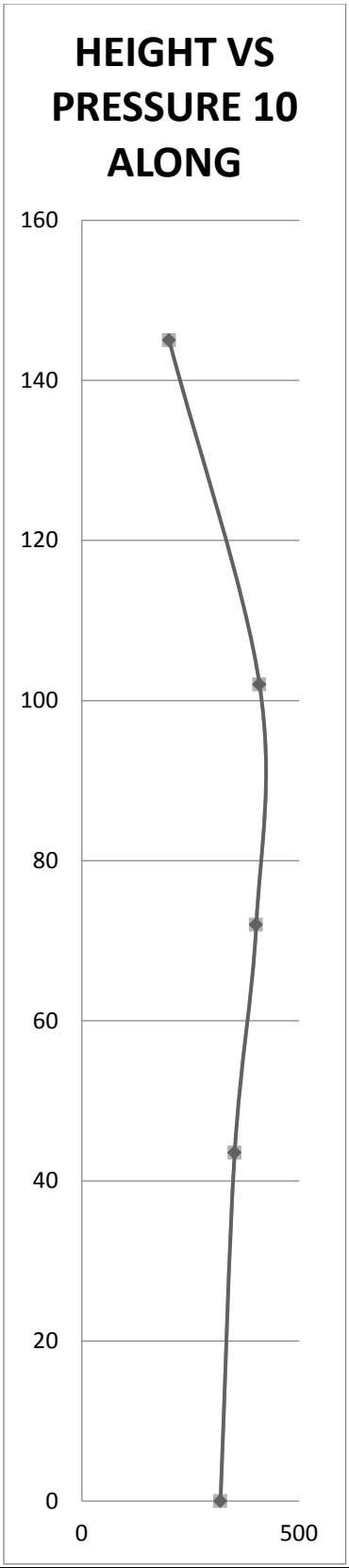
ANSYS
R14.5


HEIGHT VS PRESSURE 10 ALONG
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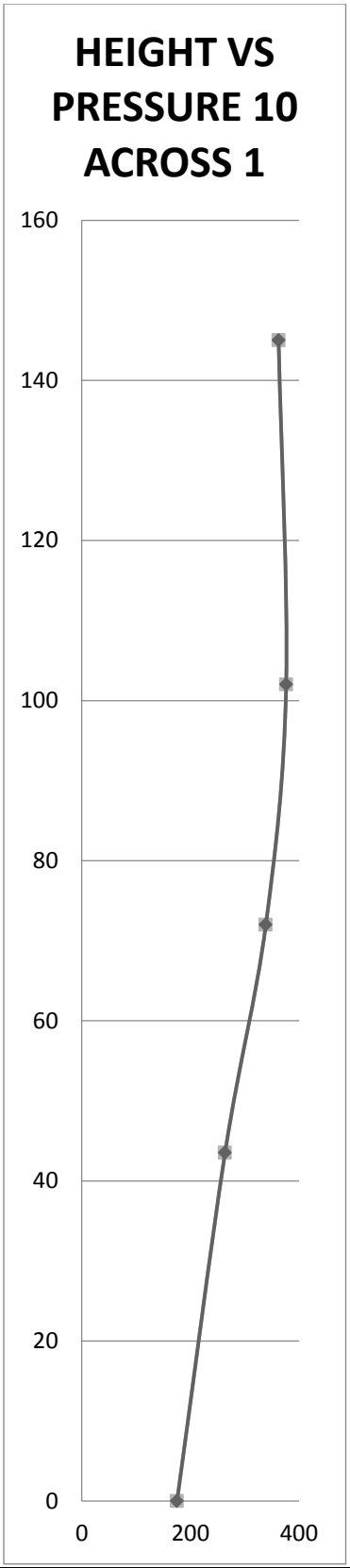
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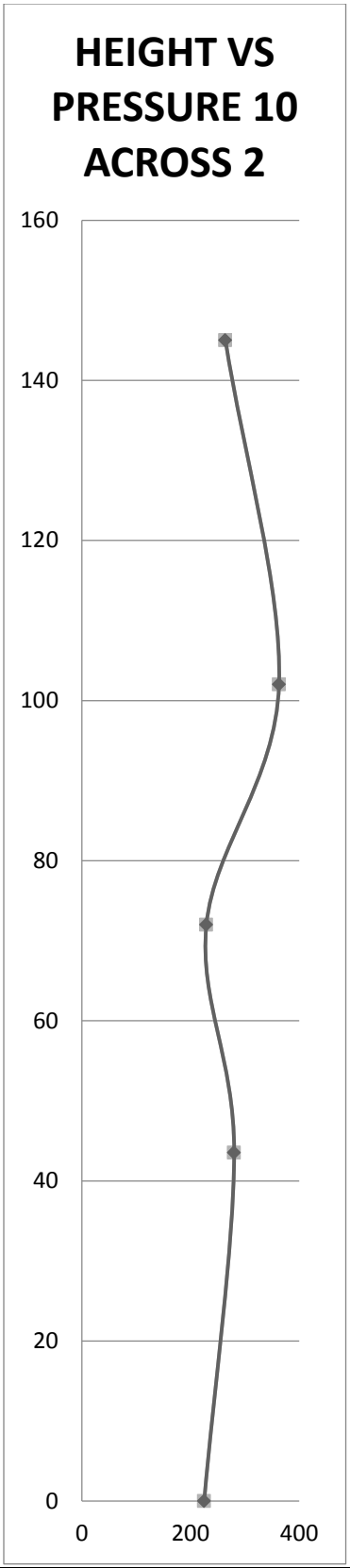
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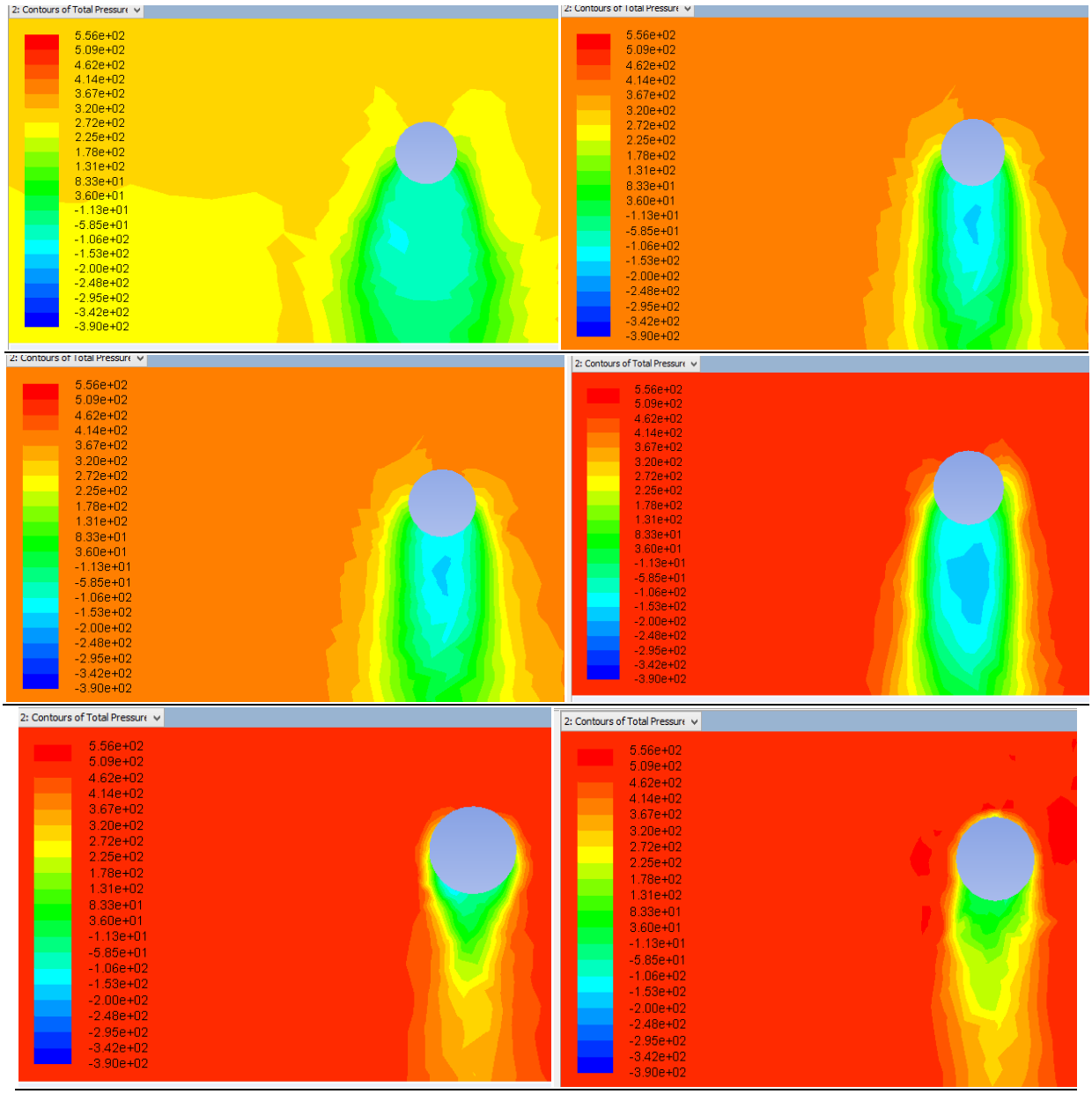
2: Contours of Total Pressure
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4.62e+02
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3.20e+02
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2.25e+02
1.78e+02
1.31e+02
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-2.48e+02
-2.95e+02
-3.42e+02
-3.90e+02

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Home | Insert | Page Layout | Formulas | Data | Review | View

Cut | Copy | Format Painter | Paste | Clipboard

Calibri | 11 | Font

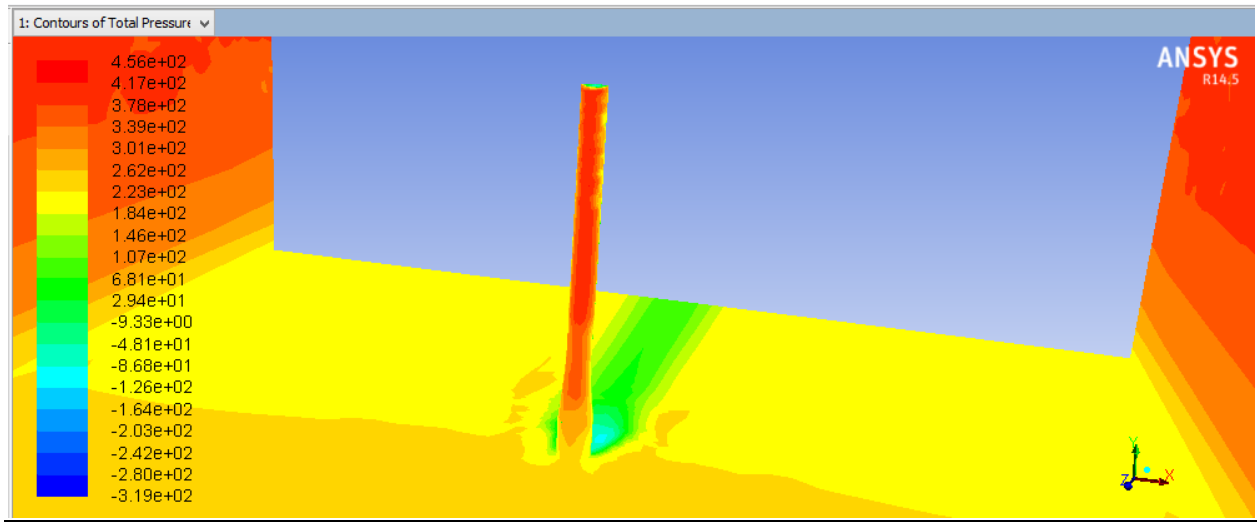
Wrap Text | Merge & Center | Alignment

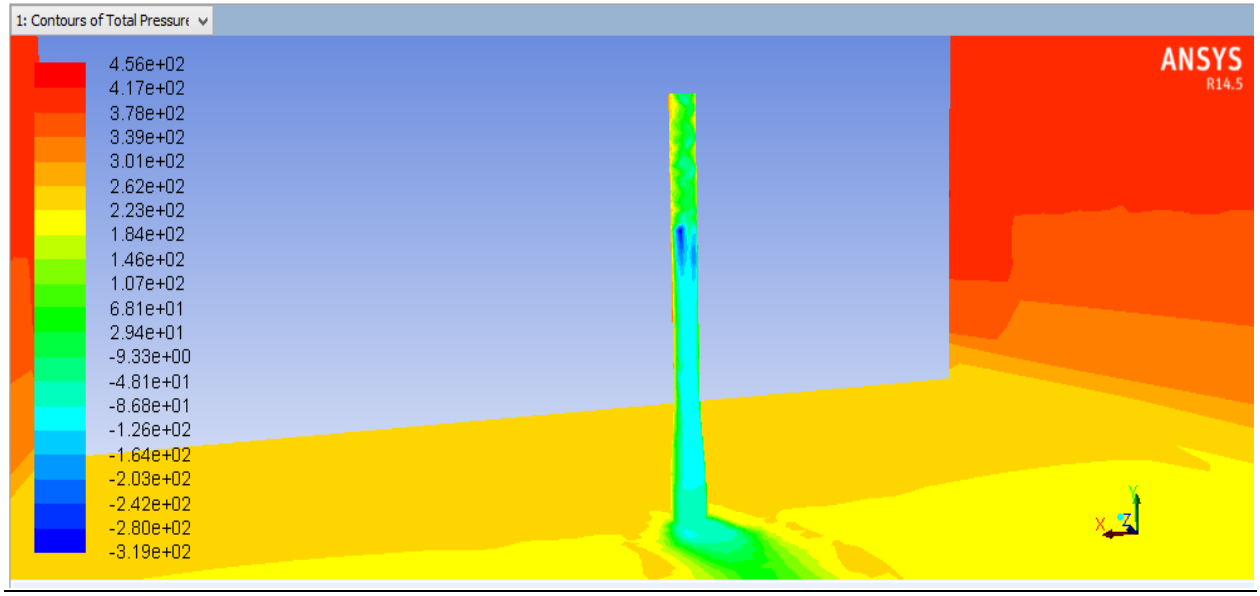
General | Number

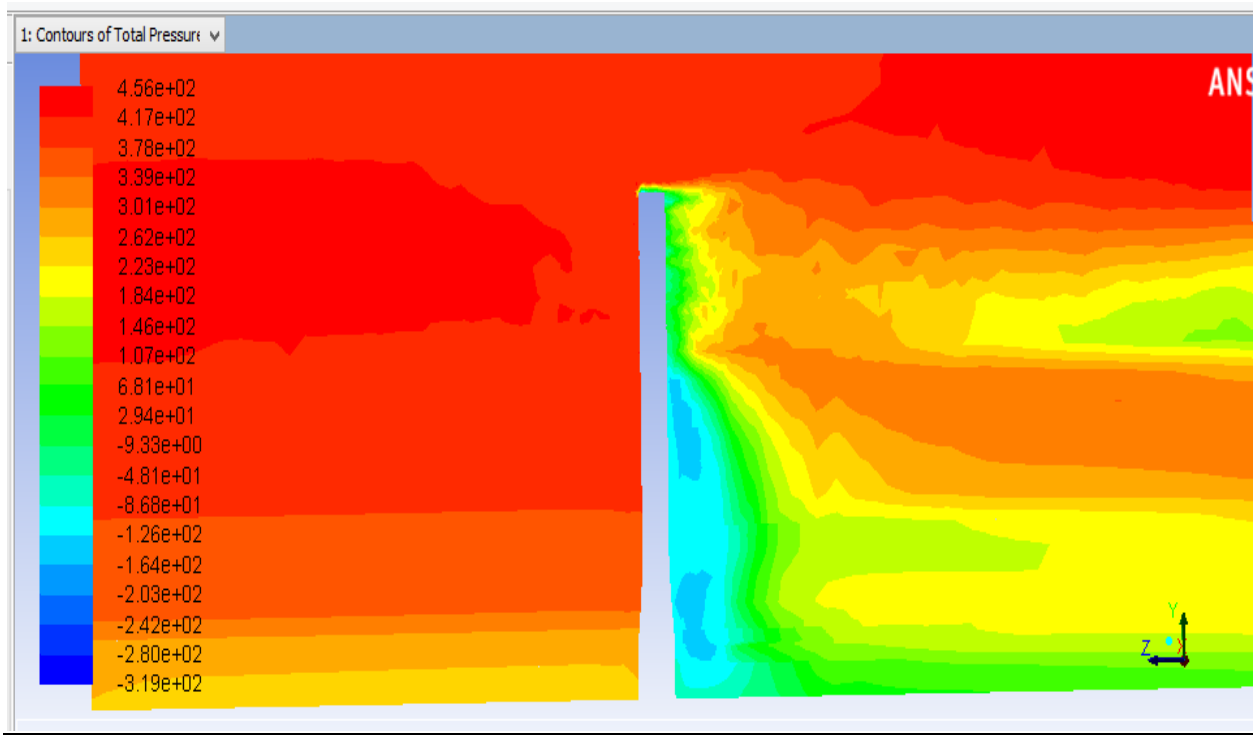
Conditional Formatting | Format as Table | Normal | Bad | Good | Neutral | Styles

O1 | v11

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																
9																



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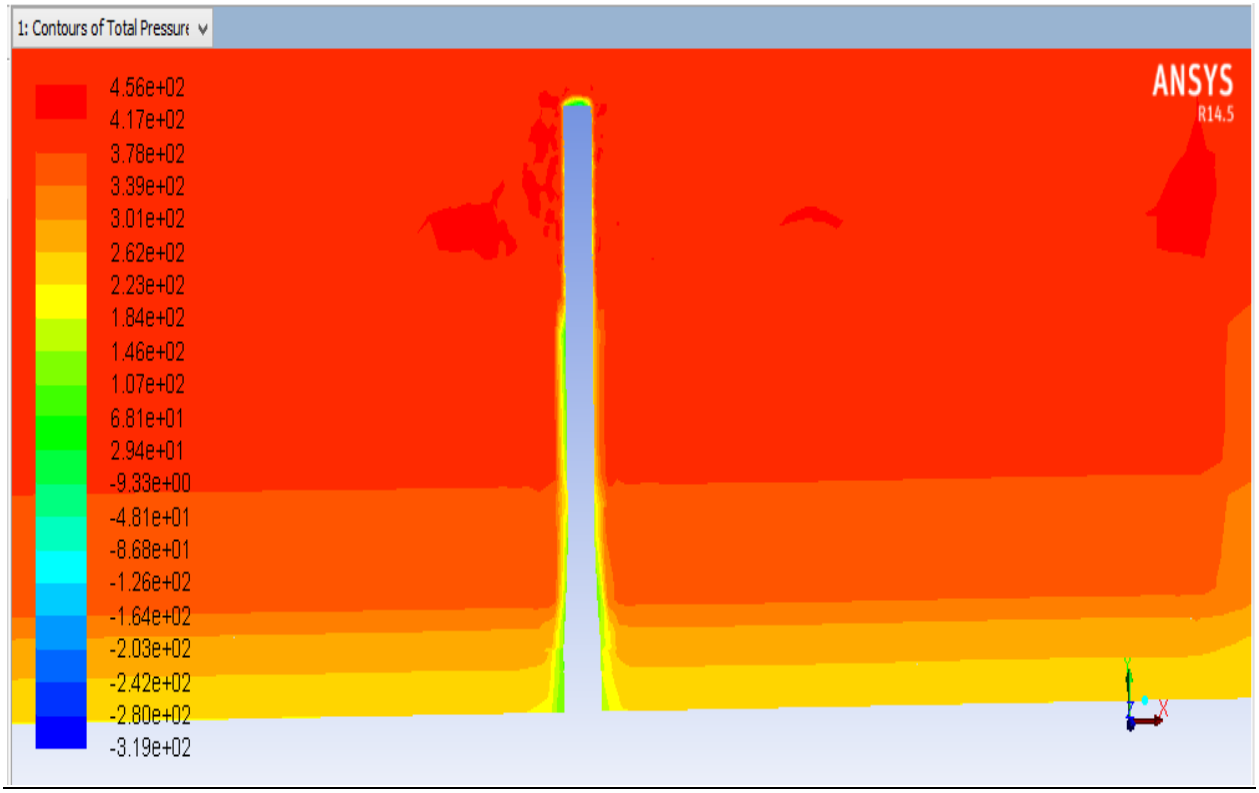
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ANSYS
R14.5
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Z
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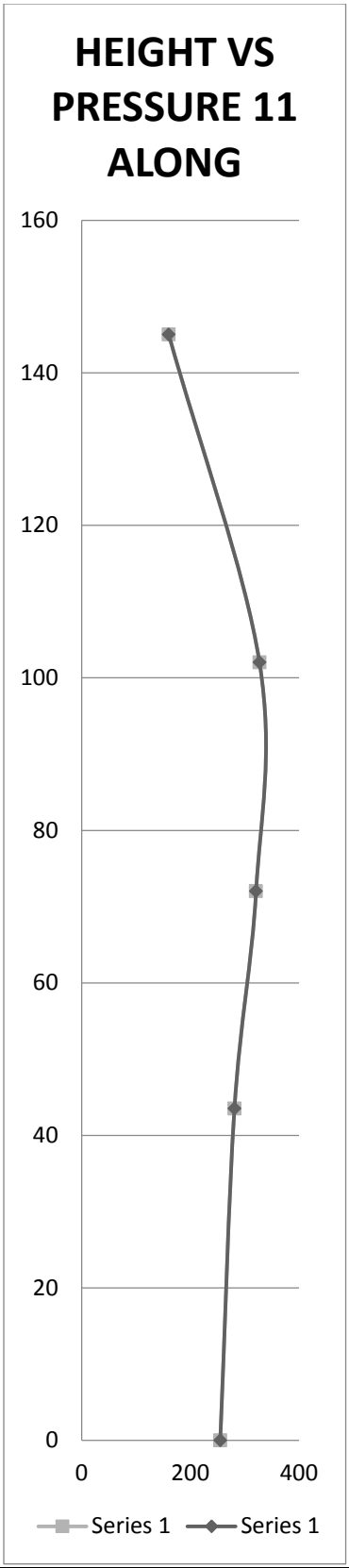
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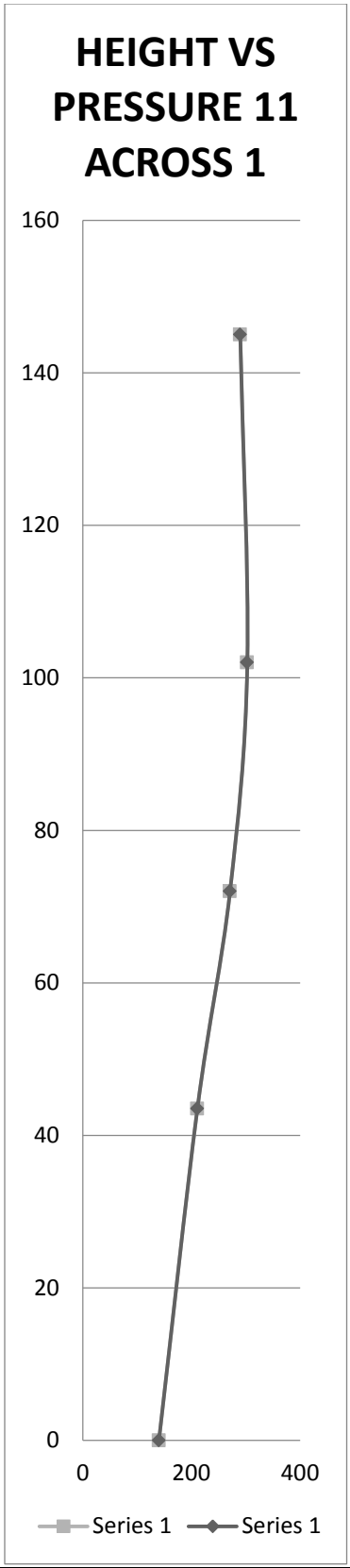
Series 1
Series 1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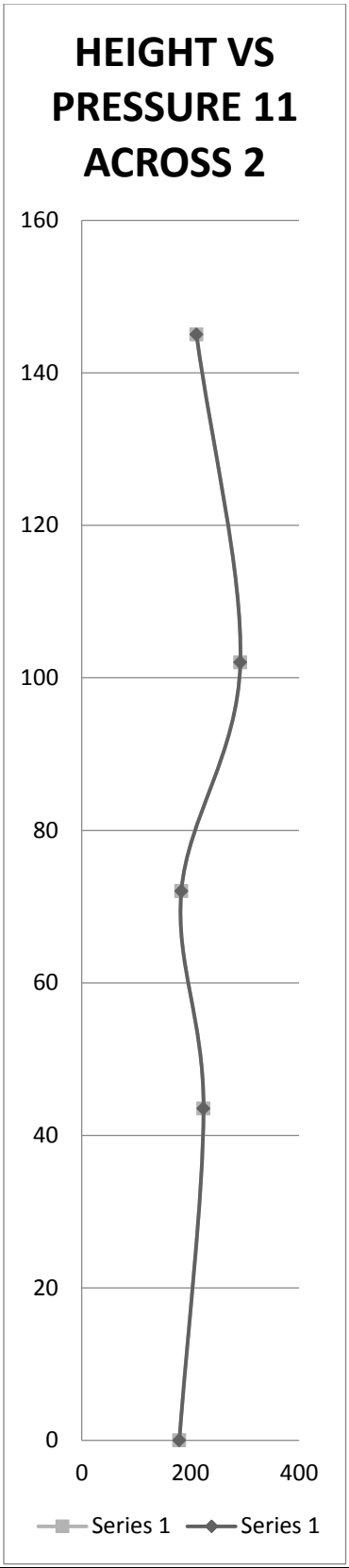
Series 1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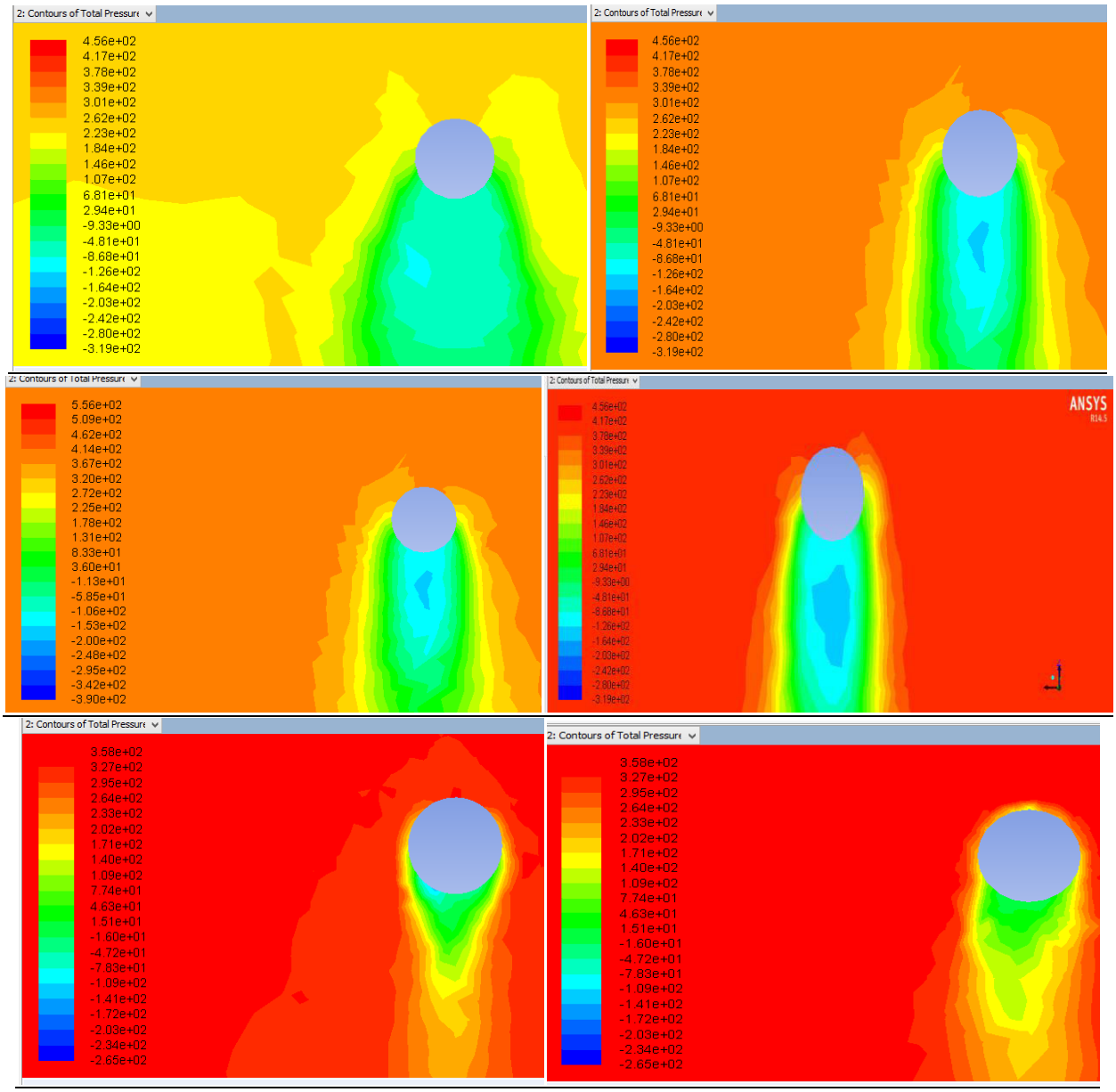
Series 1
Series 1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2: Contours of Total Pressure
4.56e+02
4.17e+02
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2: Contours of Total Pressure
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-3.42e+02
-3.90e+02
2: Contours of Total Pressure
ANSYS
R14.5
2: Contours of Total Pressure
3.58e+02
3.27e+02
2.95e+02
2.64e+02
2.33e+02
2.02e+02
1.71e+02
1.40e+02
1.09e+02
7.74e+01
4.63e+01
1.51e+01
-1.60e+01
-4.72e+01
-7.83e+01
-1.09e+02
-1.41e+02
-1.72e+02
-2.03e+02
-2.34e+02
-2.65e+02
2: Contours of Total Pressure
3.58e+02
3.27e+02
2.95e+02
2.64e+02
2.33e+02
2.02e+02
1.71e+02
1.40e+02
1.09e+02
7.74e+01
4.63e+01
1.51e+01
-1.60e+01
-4.72e+01
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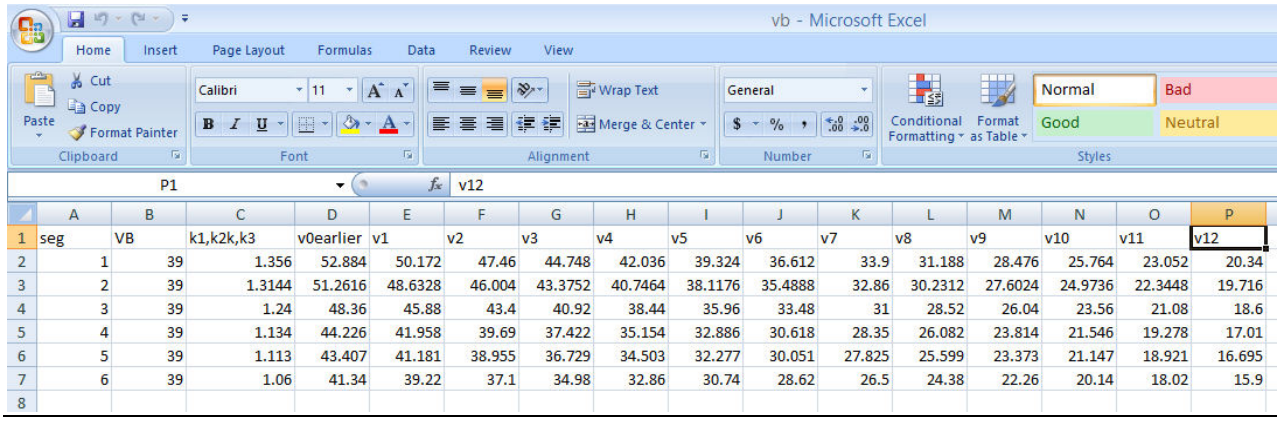
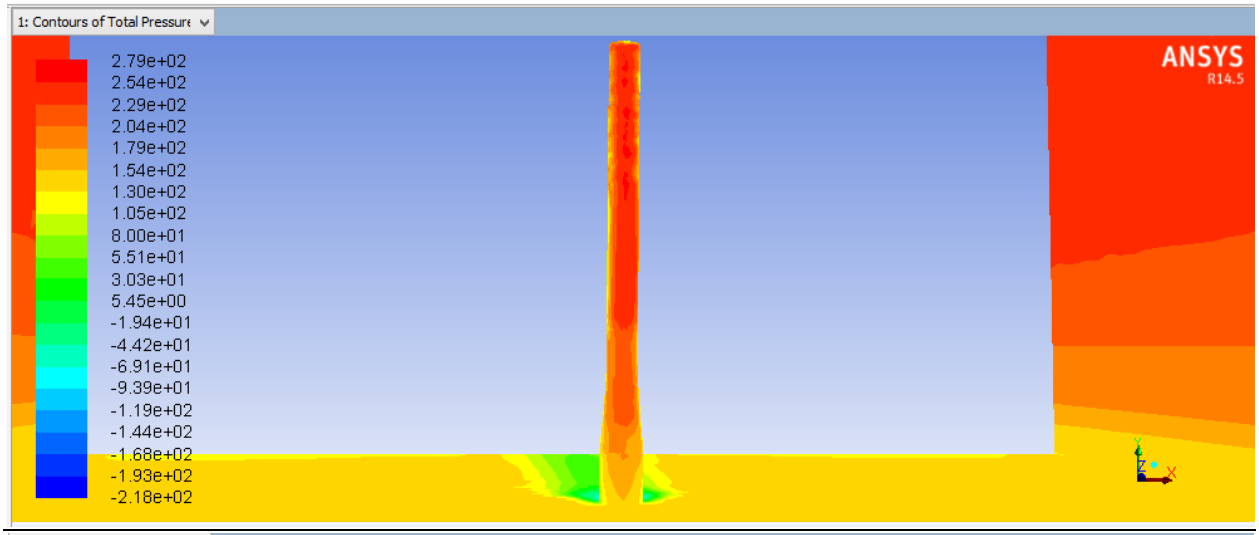
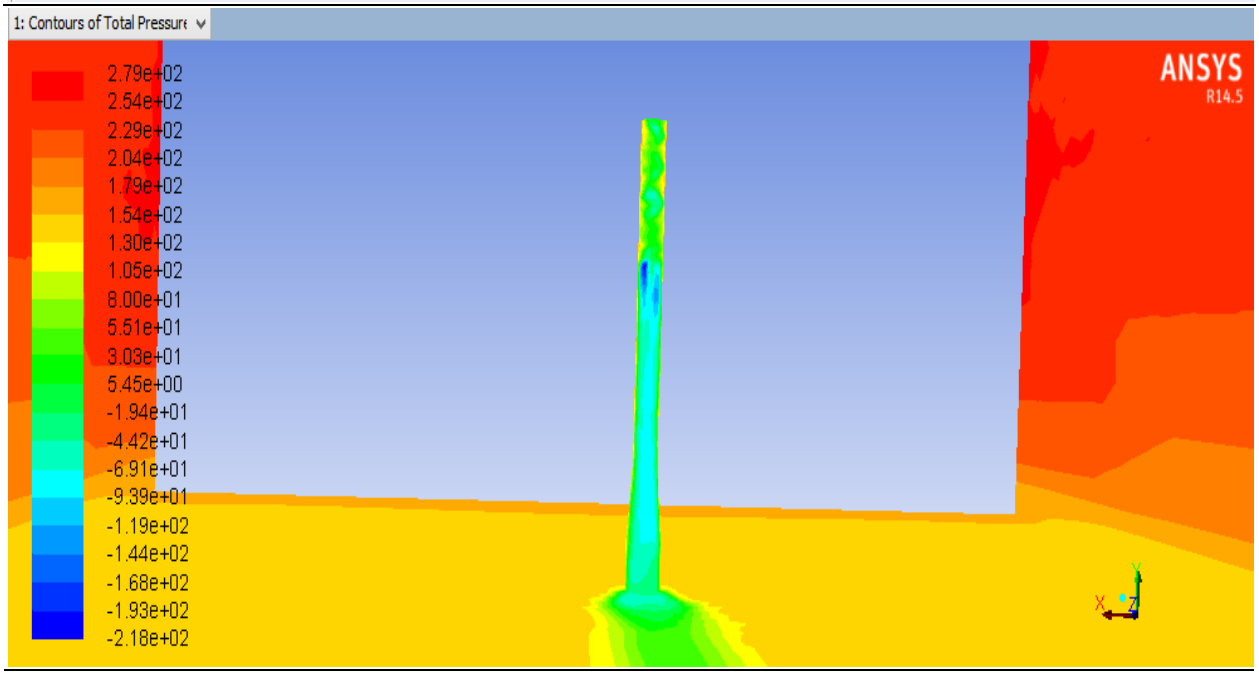
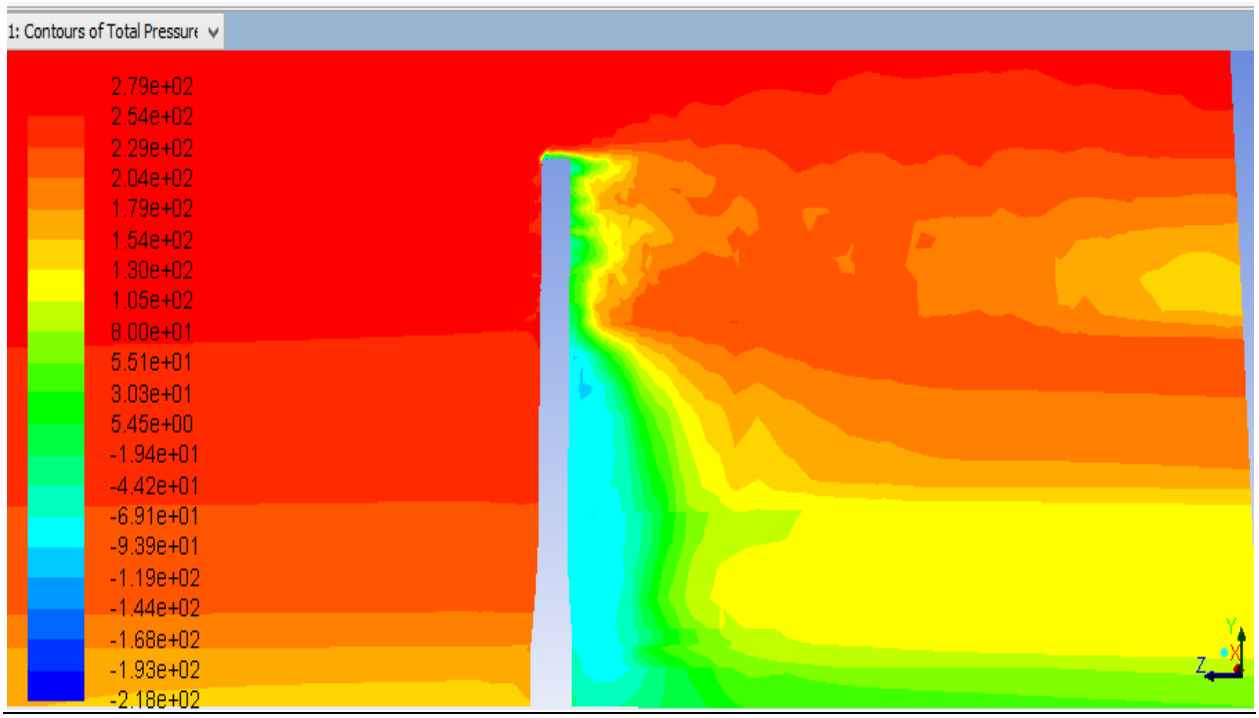


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	seg	VB	k1,k2k,k3	v0earlier	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12
2	1	39	1.356	52.884	50.172	47.46	44.748	42.036	39.324	36.612	33.9	31.188	28.476	25.764	23.052	20.34
3	2	39	1.3144	51.2616	48.6328	46.004	43.3752	40.7464	38.1176	35.4888	32.86	30.2312	27.6024	24.9736	22.3448	19.716
4	3	39	1.24	48.36	45.88	43.4	40.92	38.44	35.96	33.48	31	28.52	26.04	23.56	21.08	18.6
5	4	39	1.134	44.226	41.958	39.69	37.422	35.154	32.886	30.618	28.35	26.082	23.814	21.546	19.278	17.01
6	5	39	1.113	43.407	41.181	38.955	36.729	34.503	32.277	30.051	27.825	25.599	23.373	21.147	18.921	16.695
7	6	39	1.06	41.34	39.22	37.1	34.98	32.86	30.74	28.62	26.5	24.38	22.26	20.14	18.02	15.9
8																



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2.04e+02
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1.05e+02
8.00e+01
5.51e+01
3.03e+01
5.45e+00
-1.94e+01
-4.42e+01
-6.91e+01
-9.39e+01
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-1.44e+02
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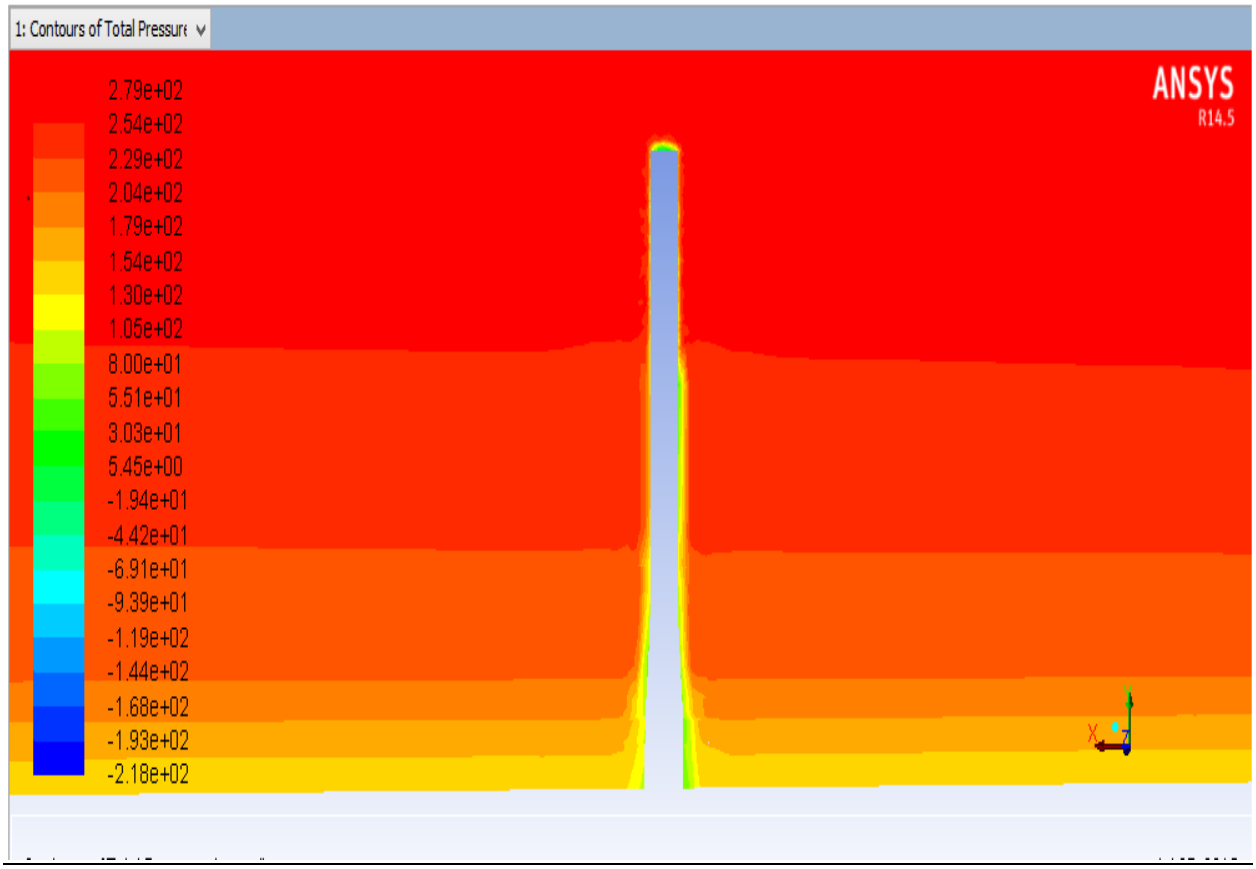
Y
X
Z


1: Contours of Total Pressure
ANSYS
R14.5
2.79e+02
2.54e+02
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2.04e+02
1.79e+02
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1.05e+02
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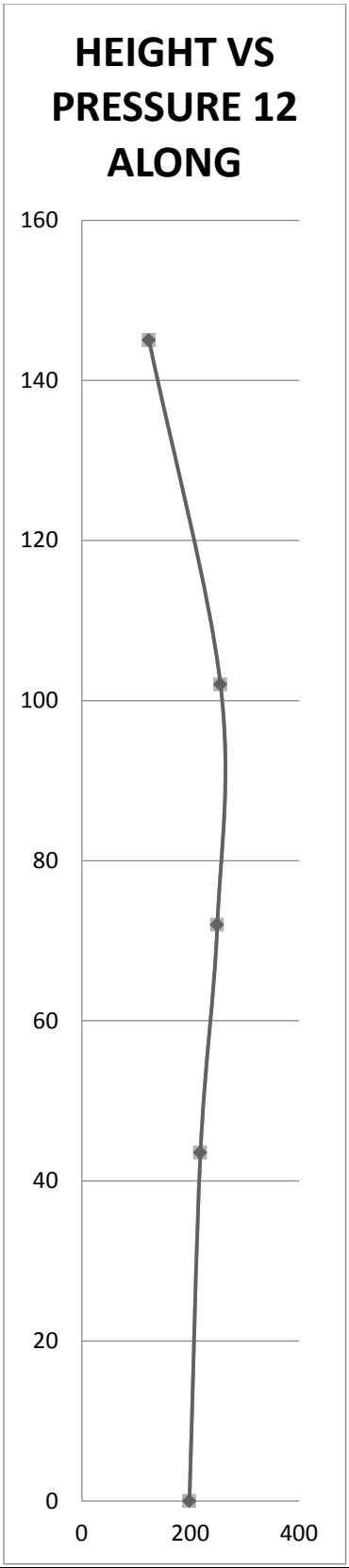
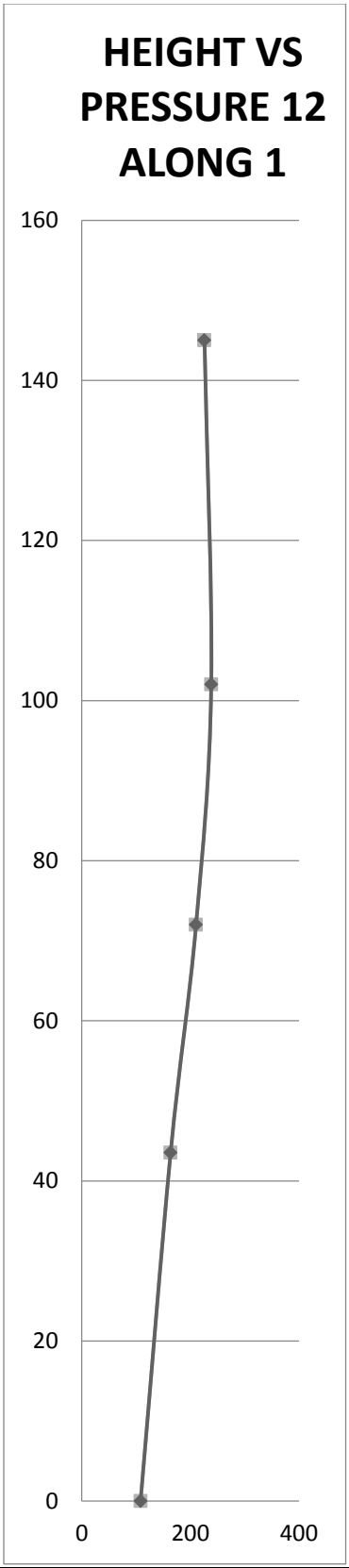
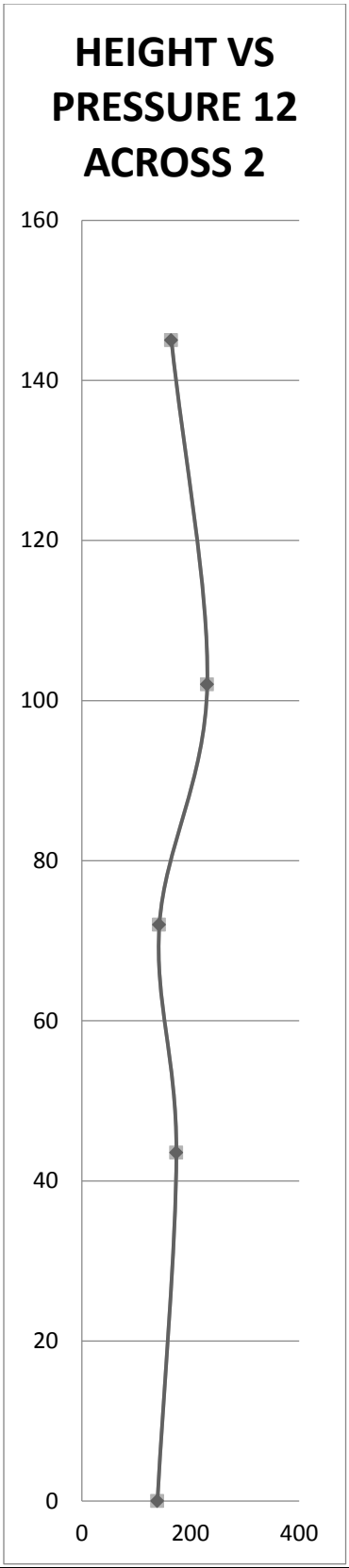
Y
X
Z


HEIGHT VS PRESSURE 12 ALONG
160
140
120
100
80
60
40
20
0
0
200
400


HEIGHT VS PRESSURE 12 ALONG 1
160
140
120
100
80
60
40
20
0
0
200
400


HEIGHT VS PRESSURE 12 ACROSS 2
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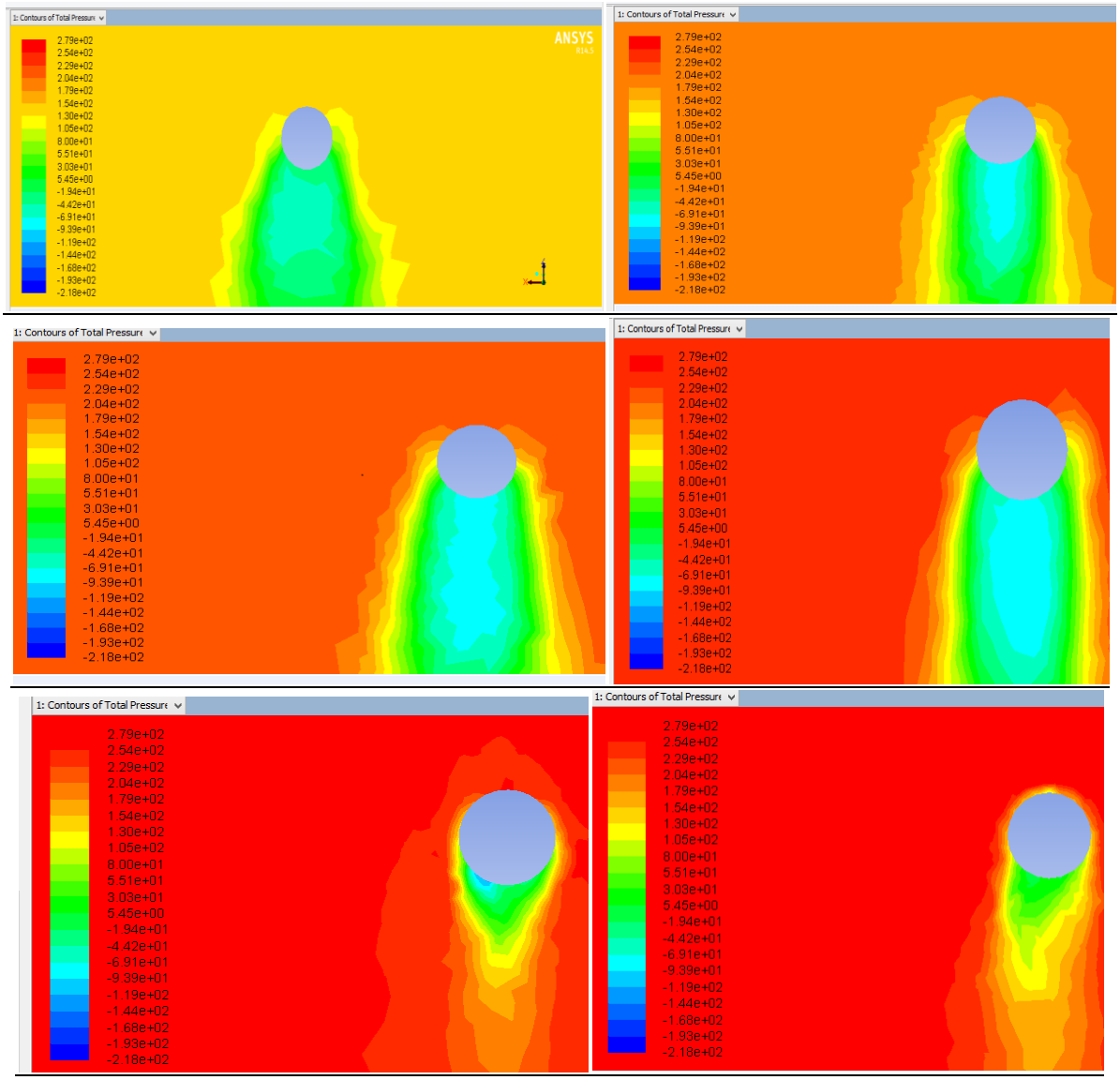
140
120
100
80
60
40
20
0
0
200
400


1: Contours of Total Pressure
ANSYS
R14.5
2.79e+02
2.54e+02
2.29e+02
2.04e+02
1.79e+02
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1.30e+02
1.05e+02
8.00e+01
5.51e+01
3.03e+01
5.45e+00
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-1.68e+02
-1.93e+02
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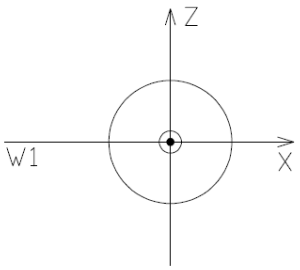
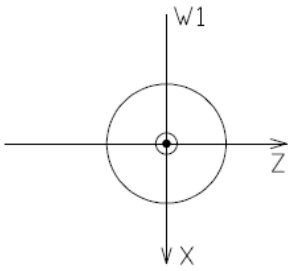
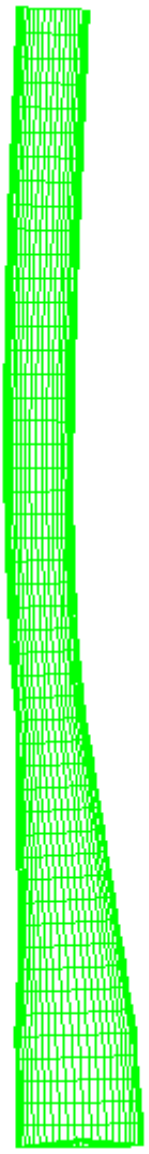






ALONG WIND RESPONSE OF CHIMNEY DEFLECTED SHAPE TAKEN FROM STAAD PRO.WITH LOADING TAKEN FROM CFD ANALYSIS

ACROSS WIND RESPONSE OF CHIMNEY DEFLECTED SHAPE TAKEN FROM STAAD PRO. WITH LOADING TAKEN FROM CFD ANALYSIS

6.9 SUPPORT REACTION DUE TO PRESSURE FROM ANSYS

	Horizontal	Vertical	Horizontal	Moment		
L/C	**FxkN**	**FykN**	**FzkN**	**MxkNm**	**My kNm**	**MzkNm**
1 DEAD+WIND ACROSS V0	**534.189**	97538.51	0	0.097	-0.001	**-22713.455**
2 DEAD+WIND ACROSS V1	471.025	97538.51	0	0.098	-0.001	-19744.816
3 DEAD+WIND ACROSS V2	503.175	97538.51	0	0.098	-0.001	-18959.336
4 DEAD+WIND ACROSS V3	446.49	97538.51	0	0.098	-0.001	-16794.787
5 DEAD+WIND ACROSS V4	393.815	97538.51	0	0.098	-0.001	-14788.903
6 DEAD+WIND ACROSS V5	344.463	97538.51	0	0.098	-0.001	-12764.433
7 DEAD+WIND ACROSS V6	297.258	97538.51	0	0.098	0	-11032.962
8 DEAD+WIND ACROSS V7	254.928	97538.51	0	0.098	0	-9452.478
9 DEAD+WIND ACROSS V8	185.378	97538.51	0	0.099	0	-4991.35
10 DEAD+WIND ACROSS V9	180.04	97538.51	0	0.098	0	-6683.52
11 DEAD+WIND ACROSS V10	147.308	97538.51	0	0.098	0	-5461.104
12 DEAD+WIND ACROSS V11	-588.578	97538.51	0	0.11	0.001	65581.742
13 DEAD+WIND ACROSS V12	94.289	97538.51	0	0.098	0	-3620.036
14 DEAD+WIND ALONG V0	**-3994.65**	97538.51	0	0.13	0.006	**2.40E+05**
15 DEAD+WIND ALONG V1	-3579.23	97538.51	0	0.128	0.006	2.19E+05
16 DEAD+WIND ALONG V2	-3139.6	97538.51	0	0.123	0.005	1.88E+05
17 DEAD+WIND ALONG V3	-2847.24	97538.51	0	0.122	0.005	1.74E+05
18 DEAD+WIND ALONG V4	-2613.4	97538.51	0	0.12	0.004	1.58E+05
19 DEAD+WIND ALONG V5	-2275.49	97538.51	0	0.118	0.004	1.42E+05

20 DEAD+WIND ALONG V6	-1957.43	97538.51	0	0.115	0.003	1.21E+05
21 DEAD+WIND ALONG V7	-1663.59	97538.51	0	0.112	0.003	1.02E+05
22 DEAD+WIND ALONG V8	-1364.93	97538.51	0	0.109	0.002	81595.961
23 DEAD+WIND ALONG V9	-1147.85	97538.51	0	0.108	0.002	70847.539
24 DEAD+WIND ALONG V10	-927.692	97538.51	0	0.106	0.002	55341.66
25 DEAD+WIND ALONG V11	-770.271	97538.51	0	0.105	0.001	46224.516
26 DEAD+WIND ALONG V12	-628.207	97538.51	0	0.104	0.001	38291.762

Chapter 7RESULTS AND DISCUSSIONS

7.1 After Analysis of chimney with respect to IS 875, IS 4998, IS 1893 and comparing our results with CFD analysis using Ansys, thus to comprehend the difference, following table is made.

Table 4Results of chimney

S.NO.	EFFECTS OF WIND	UNIT	W.R.T. (IS CODES), SIMPLIFIED METHOD	RESULTANT	W.R.T. (IS CODES), RANDOM RESPONSE	RESULTANT	W.R.T. (ANSYS)	RESULTANT
1	Along wind maximum bending moment	KTON-M	13.86	24.55	13.93	13.93	24	24.00
2	ACROSS wind maximum bending moment	KTON-M	20.26		0.044		0.00001622	
3	Along wind maximum BASE SHEAR	KTON	0.188	0.26	0.186	0.19	0.4	0.40
4	ACROSS wind maximum BASE SHEAR	KTON	0.186		0.053		0.053	
5	TIP DEFLECTION	MM	212		212		197.58	

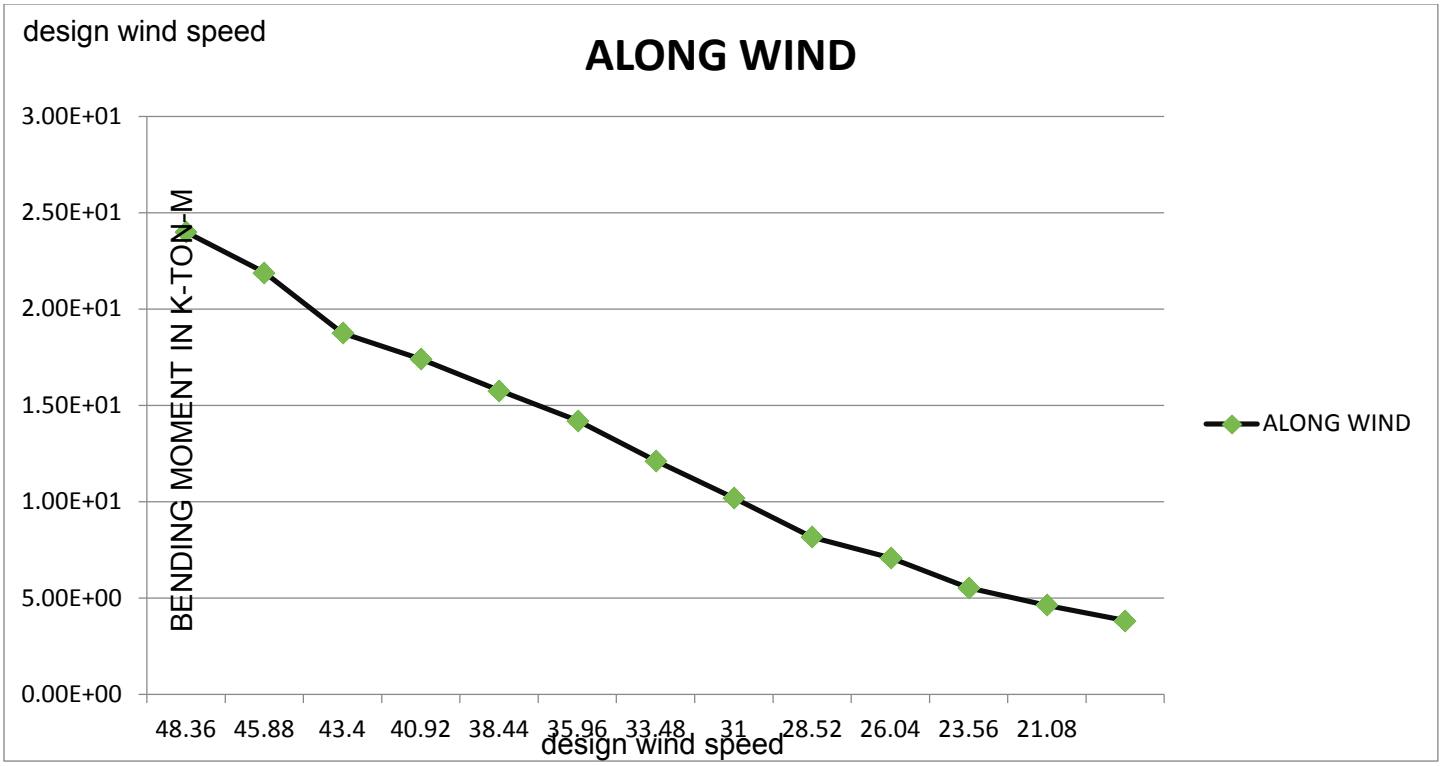


Figure 11 Bending Moment Vs Design wind speed (Along wind)

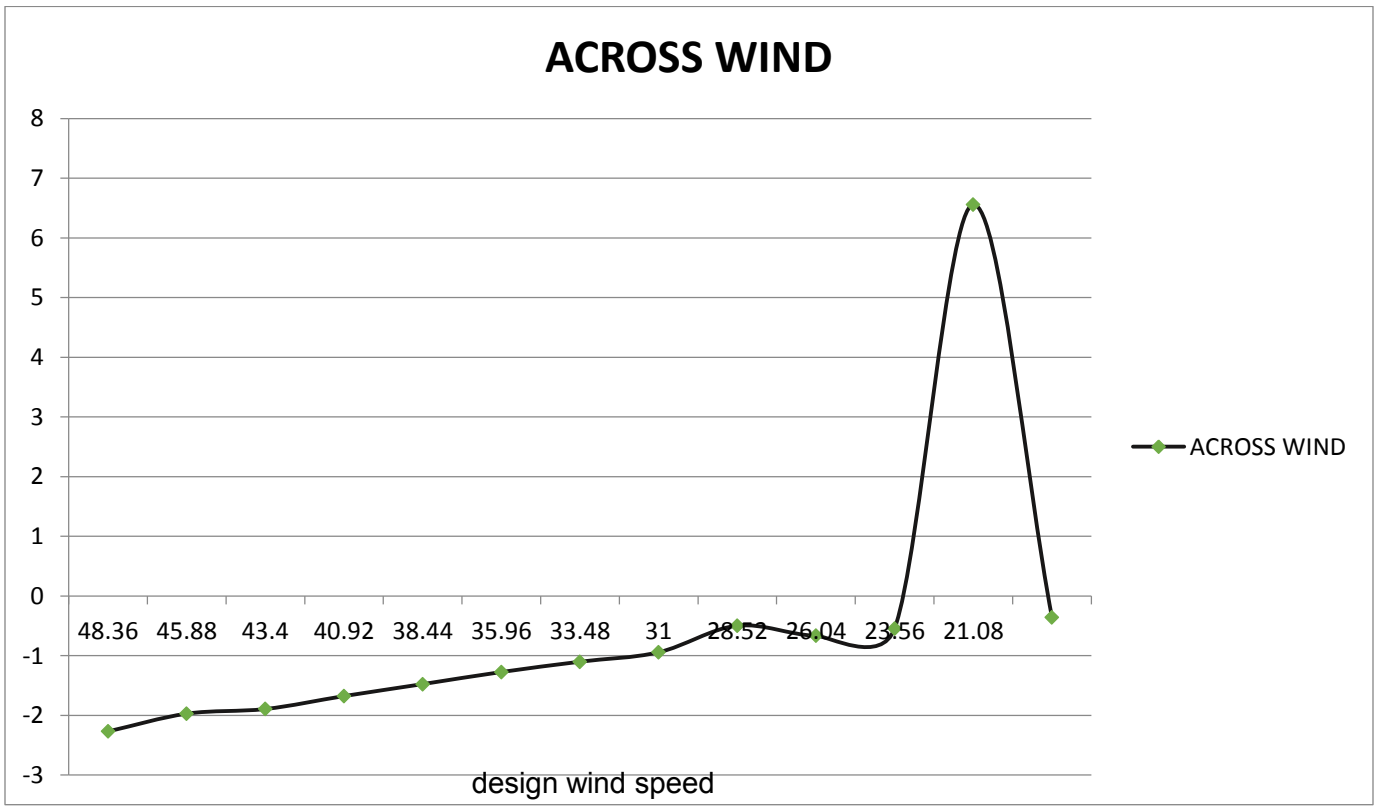
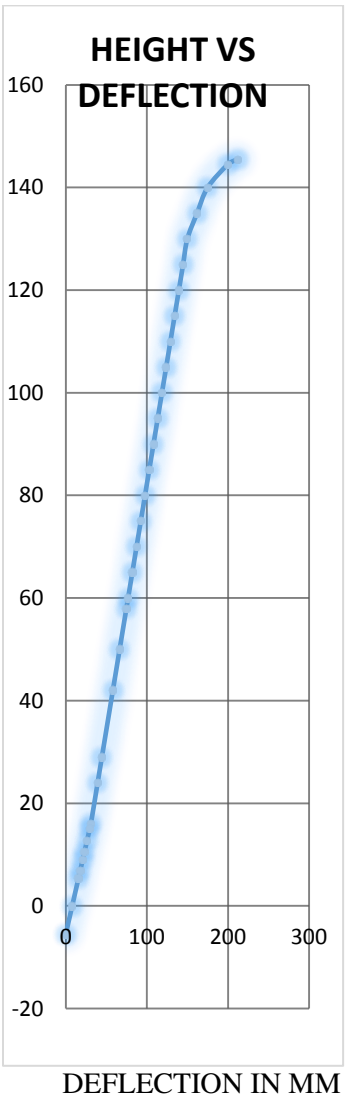
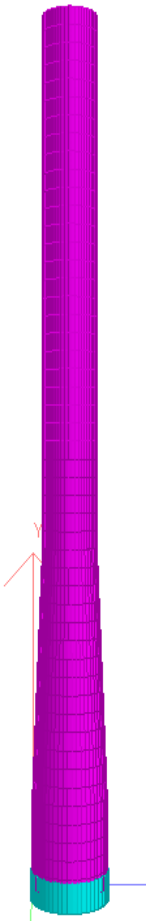


Figure 12 Moment Vs Design wind speed (Across wind)

GRAPH SHOWING DEFLECTION IN MM VS HEIGHT OF THE CHIMNEY FOR RANDOM RESPONSE CALCULATION AS PER IS 4998 EQUATIONS





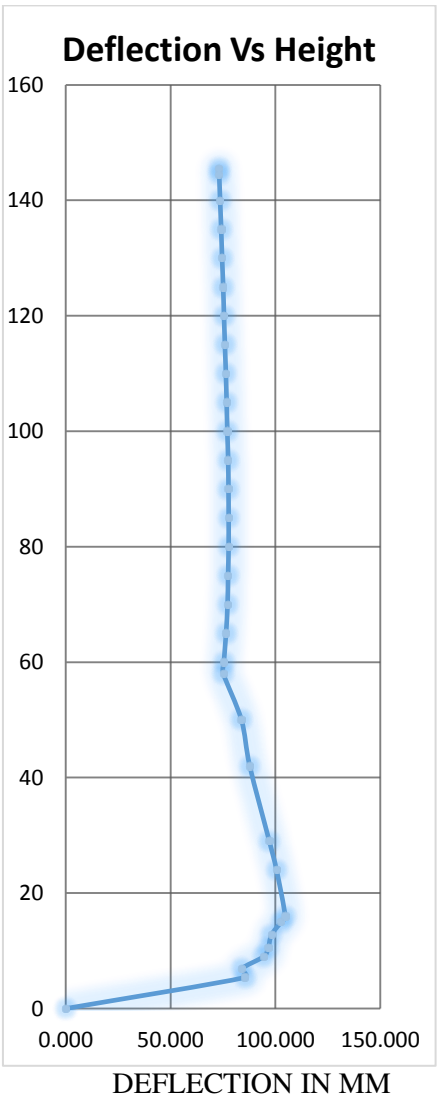


Figure 13 Deflection Vs Height (Along R.R.M.) **Figure 14 Deflection Vs Height (ACCROS R.R.M)**

Chapter 8: CONCLUSIONS AND FUTURE SCOPE

Our objective of study included Analysis of structure as per IS Codes and Simulation of structure using CFD Analysis and comparing the results with each other, after we obtained results we found that Bending moment and shear forces obtained from Simplified method of analysis as per IS 4998 and bending moment and shear force obtained with CFD analysis seems to be majorly matching but results from R.R.M. method of analysis is not matching with other 2, thus we conclude that for tall structures CFD analysis is recommended.

Future scope includes analysis of chimney of different height and material properties in similar fashion as explained in this thesis to understand behaviour of structures in a better manner, wind velocity may also be increased to study behaviour of structure when excited in higher modes, one may also go for wind tunnel testing to testify results obtained with Indian standard codes and CFD analysis.

APPENDIX: A

Structure Input Program

STAAD SPACE
START JOB INFORMATION
ENGINEER DATE 14-Oct-13
END JOB INFORMATION
INPUT WIDTH 79
UNIT METER KN
JOINT COORDINATES
1 0 0 0; 2 14 0 0; 4 0.0551972 0 0.877333; 5 0.219918 0 1.74083;
6 0.491565 0 2.57687; 7 0.865853 0 3.37228; 8 1.33688 0 4.1145;
9 1.89722 0 4.79183; 10 2.53803 0 5.39359; 11 3.24921 0 5.9103;
12 4.01954 0 6.33379; 13 4.83688 0 6.6574; 14 5.68833 0 6.87601;
15 6.56047 0 6.98619; 16 7.43953 0 6.98619; 17 8.31167 0 6.87601;
18 9.16312 0 6.6574; 19 9.98046 0 6.33379; 20 10.7508 0 5.9103;
21 11.462 0 5.39359; 22 12.1028 0 4.79183; 23 12.6631 0 4.1145;
24 13.1341 0 3.37228; 25 13.5084 0 2.57687; 26 13.7801 0 1.74083;
27 13.9448 0 0.877333; 28 13.9448 0 -0.877333; 29 13.7801 0 -1.74083;
30 13.5084 0 -2.57687; 31 13.1341 0 -3.37228; 32 12.6631 0 -4.1145;
33 12.1028 0 -4.79183; 34 11.462 0 -5.39359; 35 10.7508 0 -5.9103;
36 9.98046 0 -6.33379; 37 9.16312 0 -6.6574; 38 8.31167 0 -6.87601;
39 7.43953 0 -6.98619; 40 6.56047 0 -6.98619; 41 5.68833 0 -6.87601;
42 4.83688 0 -6.6574; 43 4.01954 0 -6.33379; 44 3.24921 0 -5.9103;
45 2.53803 0 -5.39359; 46 1.89722 0 -4.79183; 47 1.33688 0 -4.1145;
48 0.865853 0 -3.37228; 49 0.491565 0 -2.57687; 50 0.219918 0 -1.74083;
51 0.0551972 0 -0.877333; 52 0 3 0; 53 14 3 0; 54 0.0551972 3 0.877333;
55 0.219918 3 1.74083; 56 0.491565 3 2.57687; 57 0.865853 3 3.37228;
58 1.33688 3 4.1145; 59 1.89722 3 4.79183; 60 2.53803 3 5.39359;
61 3.24921 3 5.9103; 62 4.01954 3 6.33379; 63 4.83688 3 6.6574;
64 5.68833 3 6.87601; 65 6.56047 3 6.98619; 66 7.43953 3 6.98619;
67 8.31167 3 6.87601; 68 9.16312 3 6.6574; 69 9.98046 3 6.33379;
70 10.7508 3 5.9103; 71 11.462 3 5.39359; 72 12.1028 3 4.79183;
73 12.6631 3 4.1145; 74 13.1341 3 3.37228; 75 13.5084 3 2.57687;
76 13.7801 3 1.74083; 77 13.9448 3 0.877333; 78 13.9448 3 -0.877333;
79 13.7801 3 -1.74083; 80 13.5084 3 -2.57687; 81 13.1341 3 -3.37228;
82 12.6631 3 -4.1145; 83 12.1028 3 -4.79183; 84 11.462 3 -5.39359;
85 10.7508 3 -5.9103; 86 9.98046 3 -6.33379; 87 9.16312 3 -6.6574;
88 8.31167 3 -6.87601; 89 7.43953 3 -6.98619; 90 6.56047 3 -6.98619;
91 5.68833 3 -6.87601; 92 4.83688 3 -6.6574; 93 4.01954 3 -6.33379;
94 3.24921 3 -5.9103; 95 2.53803 3 -5.39359; 96 1.89722 3 -4.79183;
97 1.33688 3 -4.1145; 98 0.865853 3 -3.37228; 99 0.491565 3 -2.57687;
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104 0.0551972 6 0.877333; 105 0.219918 6 1.74083; 106 0.491565 6 2.57687;
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131 13.1341 6 -3.37228; 132 12.6631 6 -4.1145; 133 12.1028 6 -4.79183;
134 11.462 6 -5.39359; 135 10.7508 6 -5.9103; 136 9.98046 6 -6.33379;
137 9.16312 6 -6.6574; 138 8.31167 6 -6.87601; 139 7.43953 6 -6.98619;
140 6.56047 6 -6.98619; 141 5.68833 6 -6.87601; 142 4.83688 6 -6.6574;
143 4.01954 6 -6.33379; 144 3.24921 6 -5.9103; 145 2.53803 6 -5.39359;
146 1.89722 6 -4.79183; 147 1.33688 6 -4.1145; 148 0.865853 6 -3.37228;
149 0.491565 6 -2.57687; 150 0.219918 6 -1.74083; 151 0.0551972 6 -0.877333;
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156 0.491565 9 2.57687; 157 0.865853 9 3.37228; 158 1.33688 9 4.1145;

159 1.89722 9 4.79183; 160 2.53803 9 5.39359; 161 3.24921 9 5.9103;
162 4.01954 9 6.33379; 163 4.83688 9 6.6574; 164 5.68833 9 6.87601;
165 6.56047 9 6.98619; 166 7.43953 9 6.98619; 167 8.31167 9 6.87601;
168 9.16312 9 6.6574; 169 9.98046 9 6.33379; 170 10.7508 9 5.9103;
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16091 TO 16190 PRIS YD 5 ZD 1
UNIT METER KN
CONSTANTS
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LOAD 1 LOADTYPE None TITLE DEAD+WIND ACROSS V0
SELFWEIGHT Y -1
UNIT METER NEWTON
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -

14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 741
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 1112.41
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1417.92
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1593.55
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 1527.36
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -808.91
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -1179.48
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -973.52
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -1540.49
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -

15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -1122.14
LOAD 2 LOADTYPE None TITLE DEAD+WIND ACROSS V1
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 667.733
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 1000.94
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1284.09
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1426.46
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 1373.61
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -728.137
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -1062.95
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -868.335
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -

15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -1378.49
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -1008.28
LOAD 3 LOADTYPE None TITLE DEAD+WIND ACROSS V2
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 597.375
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 895.625
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1149.06
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1276.5
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 1229.1
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -763.745
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -951.142

13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -777.025
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -1233.45
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -901.75
LOAD 4 LOADTYPE None TITLE DEAD+WIND ACROSS V3
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 531.57
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 796.087
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1021.42
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1134.77
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 1092.75
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -

14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -679.043
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -845.493
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -690.672
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -1096.22
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -801.191
LOAD 5 LOADTYPE None TITLE DEAD+WIND ACROSS V4
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 468.886
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 702.49
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 901.653
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1001.54

14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 964.355
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -599.207
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -746.128
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -609.702
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -967.361
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -706.621
LOAD 6 LOADTYPE None TITLE DEAD+WIND ACROSS V5
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 405.992
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 614.142
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -

15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 788.668
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 879.338
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 844.528
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -522.578
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -652.813
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -532.93
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -846.905
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -617.647
LOAD 7 LOADTYPE None TITLE DEAD+WIND ACROSS V6
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 354.682

13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 532.369
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 683.667
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 762.037
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 732.059
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -453.865
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -565.884
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -462.017
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -734.073
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -535.012

LOAD 8 LOADTYPE None TITLE DEAD+WIND ACROSS V7
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 303.959
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 456.395
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 586.217
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 653.091
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 627.672
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -389.243
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -485.166
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -396.163
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -

15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -629.281
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -458.393
LOAD 9 LOADTYPE None TITLE DEAD+WIND ACROSS V8
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 257.361
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 386.56
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 496.45
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 607.946
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 531.075
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -329.828
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -410.728
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -

15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -335.711
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -532.16
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -388.01
LOAD 10 LOADTYPE None TITLE DEAD+WIND ACROSS V9
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 214.395
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 322.242
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 414.065
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 459.615
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 442.468
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -

14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -274.953
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -342.416
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -279.995
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -443.318
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -322.947
LOAD 11 LOADTYPE None TITLE DEAD+WIND ACROSS V10
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 175.389
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 263.771
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 338.879
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 376.287
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -

15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 362.355
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -225.076
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -280.31
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -229.145
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -362.87
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -264.284
LOAD 12 LOADTYPE None TITLE DEAD+WIND ACROSS V11
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 140.002
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 210.811
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 270.937

14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1593.55
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 289.704
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -179.725
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -224.257
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -183.312
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -291.978
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -211.301
LOAD 13 LOADTYPE None TITLE DEAD+WIND ACROSS V12
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 108.28
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -

14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 163.597
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 210.463
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 238.398
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 225.975
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX -139.051
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX -173.948
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -142.701
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX -230.789
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -164.853
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LOAD 14 LOADTYPE None TITLE DEAD+WIND ALONG V0

SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 1342.4
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 1480
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1703
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1726
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 845
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 376
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 376
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 400
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -

15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 75
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -277
LOAD 15 LOADTYPE None TITLE DEAD+WIND ALONG V1
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 1207
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 1332
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1520
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1549
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 761
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 322
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 322
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -

15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 322
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 28
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -118
LOAD 16 LOADTYPE None TITLE DEAD+WIND ALONG V2
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 1081
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 1192
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1360
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1386
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 681
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 288

14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 288
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 288
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 26
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -236
LOAD 17 LOADTYPE None TITLE DEAD+WIND ALONG V3
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 961
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 1059
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1209
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1232
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -

15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 605
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 257
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 257
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 257
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 24
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -100
LOAD 18 LOADTYPE None TITLE DEAD+WIND ALONG V4
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 848
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 935
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 1067
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -

14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 1088
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 534
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 288
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 288
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 288
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 21.9
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -81
LOAD 19 LOADTYPE None TITLE DEAD+WIND ALONG V5
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 741
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -

14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 818
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 934
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 952
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 546
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 211
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 211
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 211
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 31
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -59
LOAD 20 LOADTYPE None TITLE DEAD+WIND ALONG V6
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -

13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 643
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 709
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 809
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 825
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 473
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 183
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 183
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 183
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 26
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -

15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -80
LOAD 21 LOADTYPE None TITLE DEAD+WIND ALONG V7
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 551
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 608
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 694
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 707
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 406
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 157
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 157
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 157

13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 23
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -100
LOAD 22 LOADTYPE None TITLE DEAD+WIND ALONG V8
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 467
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 515
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 587
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 599
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 294
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 127
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -

14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 127
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 127
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 15
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -100
LOAD 23 LOADTYPE None TITLE DEAD+WIND ALONG V9
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 370
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 429
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 490
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 499
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 245

13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 106
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 106
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 106
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 12
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -36
LOAD 24 LOADTYPE None TITLE DEAD+WIND ALONG V10
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 318
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 351
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 401
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -

15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 408
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 200
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 87
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 87
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 87
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 7
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -68
LOAD 25 LOADTYPE None TITLE DEAD+WIND ALONG V11
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -
14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 255
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 281
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -

14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 320
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 327
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 160
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 78
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 78
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 78
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 16
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -
15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -46
LOAD 26 LOADTYPE None TITLE DEAD+WIND ALONG V12
SELFWEIGHT Y -1
ELEMENT LOAD
13600 13602 TO 13613 13639 TO 13649 13676 TO 13699 13726 TO 13749 -
13776 TO 13799 13826 TO 13849 13876 TO 13899 13942 TO 13946 13954 TO 13958 -
13966 TO 13970 13978 TO 13982 13990 TO 13994 14002 TO 14006 14014 TO 14018 -
14339 TO 14343 14351 TO 14355 14363 TO 14367 14375 TO 14379 14387 TO 14391 -

14399 TO 14403 14411 TO 14415 14423 TO 14427 14435 TO 14439 14447 TO 14451 -
14459 TO 14463 14471 TO 14475 14483 TO 14487 14495 TO 14499 14507 TO 14511 -
14519 TO 14523 16035 TO 16039 PR GX 198
13947 TO 13952 13959 TO 13965 13971 TO 13977 13983 TO 13988 13995 TO 14000 -
14007 TO 14012 14019 TO 14024 14344 TO 14349 14356 TO 14361 14368 TO 14373 -
14380 TO 14385 14392 TO 14397 14404 TO 14410 14416 TO 14422 14428 TO 14433 -
14440 TO 14445 14452 TO 14457 14464 TO 14469 14476 TO 14481 14488 TO 14493 -
14500 TO 14505 14512 TO 14517 14524 TO 14529 15869 TO 15873 15895 TO 15909 -
16030 TO 16034 16040 16041 16046 TO 16049 16072 TO 16090 PR GX 218
13900 TO 13903 13926 TO 13941 14532 14535 TO 14542 14594 TO 14600 -
14623 TO 14629 14652 TO 14658 14681 TO 14687 14710 TO 14716 14739 TO 14745 -
14768 TO 14774 14797 TO 14803 14826 TO 14832 14855 TO 14861 14884 TO 14890 -
15580 TO 15586 15609 TO 15615 15638 TO 15644 15667 TO 15673 15696 TO 15702 -
15725 TO 15731 15754 TO 15760 15783 TO 15789 15812 TO 15818 15841 TO 15847 -
16000 16001 16004 16005 16008 16009 16012 16013 16016 16017 16020 16021 -
16024 16025 16028 16029 PR GX 249
14543 TO 14554 14601 TO 14612 14630 TO 14641 14659 TO 14670 14688 TO 14699 -
14717 TO 14728 14746 TO 14757 14775 TO 14786 14804 TO 14815 14833 TO 14844 -
14862 TO 14873 14891 TO 14902 15587 TO 15598 15616 TO 15627 15645 TO 15656 -
15674 TO 15685 15703 TO 15714 15732 TO 15743 15761 TO 15772 15790 TO 15801 -
15819 TO 15830 15848 TO 15859 15952 15953 15956 15957 15960 15961 15964 -
15965 15968 15969 15972 15973 15976 15977 15980 15981 15984 15985 15988 -
15989 15992 15993 15996 15997 PR GX 255
14531 14555 TO 14564 14613 TO 14622 14642 TO 14651 14671 TO 14680 -
14700 TO 14709 14729 TO 14738 14758 TO 14767 14787 TO 14796 14816 TO 14825 -
14845 TO 14854 14874 TO 14883 14903 TO 14912 15599 TO 15608 15628 TO 15637 -
15657 TO 15666 15686 TO 15695 15715 TO 15724 15744 TO 15753 15773 TO 15782 -
15802 TO 15811 15831 TO 15840 15860 TO 15868 15914 TO 15917 15920 15921 -
15924 15925 15928 15929 15932 15933 15936 15937 15940 15941 15944 15945 -
15948 15949 PR GX 123
13601 13614 TO 13638 13650 TO 13675 13700 TO 13725 13750 TO 13775 -
13800 TO 13825 13850 TO 13875 14026 TO 14030 14039 TO 14043 14051 TO 14055 -
14063 TO 14067 14075 TO 14079 14087 TO 14091 14099 TO 14103 14111 TO 14115 -
14123 TO 14127 14135 TO 14139 14147 TO 14151 14159 TO 14163 14171 TO 14175 -
14183 TO 14187 14195 TO 14199 14207 TO 14211 14219 TO 14223 14231 TO 14235 -
14243 TO 14247 14255 TO 14259 14267 TO 14271 14279 TO 14283 14291 TO 14295 -
14303 TO 14307 14315 TO 14319 14327 TO 14331 PR GX 69
14031 TO 14037 14044 TO 14049 14056 TO 14061 14068 TO 14073 14080 TO 14085 -
14092 TO 14097 14104 TO 14110 14116 TO 14122 14128 TO 14133 14140 TO 14145 -
14152 TO 14157 14164 TO 14169 14176 TO 14181 14188 TO 14193 14200 TO 14205 -
14212 TO 14217 14224 TO 14229 14236 TO 14241 14248 TO 14254 14260 TO 14266 -
14272 TO 14277 14284 TO 14289 14296 TO 14301 14308 TO 14313 14320 TO 14325 -
14332 TO 14337 15874 TO 15894 16042 TO 16045 16050 TO 16071 PR GX 69
13904 TO 13925 14533 14534 14565 TO 14571 14913 TO 14919 14942 TO 14948 14971 -
14972 TO 14977 15000 TO 15006 15029 TO 15035 15058 TO 15064 15087 TO 15093 -
15116 TO 15122 15145 TO 15151 15174 TO 15180 15203 TO 15209 15232 TO 15238 -
15261 TO 15267 15290 TO 15296 15319 TO 15325 15348 TO 15354 15377 TO 15383 -
15406 TO 15412 15435 TO 15441 15464 TO 15470 15493 TO 15499 15522 TO 15528 -
15551 TO 15557 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 69
13904 TO 13925 14533 14534 14565 TO 14583 14913 TO 14931 14942 TO 14960 14971 -
14972 TO 14989 15000 TO 15018 15029 TO 15047 15058 TO 15076 15087 TO 15105 -
15116 TO 15134 15145 TO 15163 15174 TO 15192 15203 TO 15221 15232 TO 15250 -
15261 TO 15279 15290 TO 15308 15319 TO 15337 15348 TO 15366 15377 TO 15395 -
15406 TO 15424 15435 TO 15453 15464 TO 15482 15493 TO 15511 15522 TO 15540 -
15551 TO 15569 15950 15951 15954 15955 15958 15959 15962 15963 15966 15967 -
15970 15971 15974 15975 15978 15979 15982 15983 15986 15987 15990 15991 -
15994 15995 15998 15999 16002 16003 16006 16007 16010 16011 16014 16015 -
16018 16019 16022 16023 16026 16027 PR GX 19
14584 TO 14593 14932 TO 14941 14961 TO 14970 14990 TO 14999 15019 TO 15028 -
15048 TO 15057 15077 TO 15086 15106 TO 15115 15135 TO 15144 15164 TO 15173 -
15193 TO 15202 15222 TO 15231 15251 TO 15260 15280 TO 15289 15309 TO 15318 -
15338 TO 15347 15367 TO 15376 15396 TO 15405 15425 TO 15434 15454 TO 15463 -

15483 TO 15492 15512 TO 15521 15541 TO 15550 15570 TO 15579 15910 TO 15913 -
15918 15919 15922 15923 15926 15927 15930 15931 15934 15935 15938 15939 -
15942 15943 15946 15947 PR GX -15
LOAD 27 MASS DATA AND INSTRUCTION FOR CALCULATING FREQUENCIES AND MODES
SELFWEIGHT X 1
SELFWEIGHT Y 1
SELFWEIGHT Z 1
MODAL CALCULATION REQUESTED
PERFORM ANALYSIS
FINISH

Appendix B

Design of CHIMNEY

	SHEAR	BASE SHEAR	Bending	DESIGN CALCULATIONS								
Height(M)	ton	Ton	ton-M	Weight(KN)	Eccentricity (e)mm	Min stress	Max stress	providereinf.	providedreinf.	Compression capacity	Tension capacity	CHECK
145.500	1.37	0.0	0.0			in concrete(N/Sqmm)		1% thus Ast	every 300mm			
144.500	6.17	1.4	228.9	273	8	0	0	107153	1050	10	-2	HENCE SAFE
140.000	6.85	7.5	324.9	1502	2122	0	0	107153	1050	10	-2	HENCE SAFE
135.000	6.85	14.3	408.4	2867	1397	0	0	107153	1050	10	-2	HENCE SAFE
130.000	6.85	21.1	571.4	4233	1324	0	1	107153	1050	10	-2	HENCE SAFE
125.000	6.84	27.8	772.1	5598	1353	0	1	107153	1050	10	-2	HENCE SAFE
120.000	6.84	34.6	908.6	6963	1280	0	1	107153	1050	10	-2	HENCE SAFE
115.000	6.84	41.5	1784.2	8329	2102	0	1	107153	1050	10	-2	HENCE SAFE
110.000	6.63	48.3	2326.3	9694	2354	0	2	107153	1050	10	-2	HENCE SAFE
105.000	6.41	55.6	3842.9	11059	3409	0	2	107153	1050	10	-2	HENCE SAFE
100.000	6.41	62.8	4541.5	12425	3586	0	3	107153	1050	10	-2	HENCE SAFE
95.000	6.41	70.0	5150.4	13790	3664	-1	3	107153	1050	10	-2	HENCE SAFE
90.000	6.41	76.5	5390.9	15155	3489	0	3	107153	1050	10	-2	HENCE SAFE
85.000	6.40	83.5	5904.6	16521	3506	-1	4	107153	1050	10	-2	HENCE SAFE
80.000	6.40	90.8	6503.7	17886	3567	-1	4	107153	1050	10	-2	HENCE SAFE
75.000	6.40	98.3	7183.7	19251	3661	-1	4	107153	1050	10	-2	HENCE SAFE
70.000	6.39	104.4	7420.7	20617	3531	-1	5	107153	1050	10	-2	HENCE SAFE
65.000	6.40	112.2	8200.4	21982	3660	-1	5	107153	1050	10	-2	HENCE SAFE
60.000	2.51	120.3	9046.2	23347	3801	-1	5	107153	1050	10	-2	HENCE SAFE
58.000	10.15	125.3	9782.6	23894	4016	-1	6	107153	1050	10	-2	HENCE SAFE
50.000	10.53	137.6	10957.8	26078	4122	-1	5	118500	1080	10	-2	HENCE SAFE
42.000	17.47	150.5	12256.4	28494	4220	-1	5	136427	1164	10	-2	HENCE SAFE
29.000	6.71	170.0	14067.5	33014	4180	-1	5	162800	1257	10	-2	HENCE SAFE
24.000	10.33	180.8	15306.7	35088	4279	-1	5	173579	1293	10	-2	HENCE SAFE
16.000	1.27	195.7	16904.6	38627	4293	0	4	191462	1350	10	-2	HENCE SAFE
15.000	2.85	203.1	17839.5	39115	4474	0	5	191462	1350	10	-2	HENCE SAFE
12.750	2.72	212.8	18967.2	40213	4627	-1	5	191462	1350	10	-2	HENCE SAFE
10.500	1.72	223.5	20151.9	41311	4785	-1	5	191462	1350	10	-2	HENCE SAFE
9.000	2.41	234.4	21318.6	42043	4974	-1	5	191462	1350	10	-2	HENCE SAFE
6.900	1.72	246.7	22605.9	43067	5149	-1	5	191462	1350	10	-2	HENCE SAFE
5.400	114.95	258.4	23775.3	43799	5325	-1	6	191462	1350	10	-2	HENCE SAFE
0.000	0.00	265.2	24546.1	46434	5186	-1.1	6	191462	1350	10	-2	HENCE SAFE

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