DESIGN PROVISIONS
FOR
SLENDER CONCRETE COLUMNS

By

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ABSTRACT

The main objective of this study was to evaluate methods of designing uniaxially loaded slender reinforced concrete columns in braced frames.

An analytical method was used to predict capacities of a broad range of slender concrete columns. The method incorporates the nonlinear behaviour of concrete sections, time dependent effects, and the nonlinear response of slender columns.

The accuracy of the current ACI Moment Magnifier Method of accounting for slenderness effects is studied. Large conservative errors inherent in this method are identified and discussed.

It is concluded that slender concrete columns in braced frames can be designed more easily and with greater accuracy by an empirical direct moment magnification method. Such a method, involving the use of graphs, is presented for the design of columns with rectangular sections. The accuracy and limitations of this method are discussed and recommendations for further study are made.

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f_y = 40 & 60 ksi

L/h = 10, 20, & 30

e_1/e_2 = 1.0, 0.0, & -0.98

P_{sus}/P_{an} = 0.2, 0.4, 0.6, & 0.8

LIST OF SYMBOLS

Symbols used in the text are defined where they first appear and occasionally thereafter. A summary of the more frequently used symbols is given here.

d	depth of cross section
E_c	secant modulus of concrete
E_s	elastic modulus of steel
EI	stiffness of cross section
e/h	ratio of end eccentricity to section depth
e_1/e_2	ratio of end eccentricities
f_c	stress in concrete
f_c'	concrete strength from cylinder test
f_{co}	concrete strength in structural member
f_s	stress in steel
f_y	yield strength of steel
k_3	ratio of strength of concrete in member to that from cylinder test, f_{co}/f_c'
L	length of column
L/h	slenderness of column, ratio of column length to depth
M	bending moment
M_c	magnified moment
M_u	design moment
$\overline{M}$	moment capacity of cross section for a given $\overline{P}$

P	axial load
P_{an}	column capacity as predicted by analytical method
P_{sus}	sustained load
P_{sus}/P_{an}	ratio of sustained load to analytical column capacity
P_u	design axial load
$\overline{P}$	axial load capacity of cross section for a given $\overline{M}$
t	time in days
t_0	time in days when shrinkage is assumed to begin, time in days at beginning of first time interval
t_n	time at the end of the n^{th} time interval
ϕ	capacity reduction factor
ϕ_{cr}	concrete creep factor, ratio of concrete creep strain to effective concrete strain
ϕ_{cru}	ultimate creep factor
Φ	curvature of cross section
ε_c	effective concrete strain
ε_{co}	concrete strain at maximum stress
ε_{cr}	concrete creep strain
ε_{cru}	ultimate concrete creep strain
εm	total strain at mid-depth of section
ε_s	strain in steel
ε_{sh}	concrete shrinkage strain
ε_{shu}	ultimate concrete shrinkage strain
δ_{an}	moment magnification from analytical results

$\delta_{an\ max.}$	maximum moment magnification, δ_{an}, for the range of cross sections of the study columns (Section 5.4) for a specific loading condition
γ	ratio of the distance between reinforcing layers to the depth of the cross section
$\gamma_{equiv.}$	equivalent value of γ to account for sections with more than two layers of steel (defined by Eqn. 5.15)

CHAPTER 1

INTRODUCTION

1.1 Nature of the Problem

The acceptance of the concept of Ultimate Strength Design and the greatly increased knowledge of reinforced concrete behaviour in general has led to the use of lighter structural members. This, further increased by the economical production of higher strength concrete and reinforcing steel has created the need for increased attention to the deformation behaviour of structural members. Slender columns represent a particularly important case of reinforced concrete members since capacity is controlled by the deflection behaviour. The use of slender columns will continue to increase as the economical strength of concretes continues to rise and as knowledge of their behaviour is reflected by changes in design provisions.

The analysis of slenderness effects in columns is particularly interesting since it encompasses many of the more important behaviour aspects of reinforced concrete. The nonlinear behaviour of members, which interested many of the earlier writers such as Euler, Engesser and von Kármán, is further complicated in reinforced concrete by the nonlinear behaviour of sections. Furthermore, time dependent effects such as creep and shrinkage play a major role in the behaviour of slender reinforced concrete columns.

Considerable knowledge about the behaviour of slender reinforced concrete columns has been gained from extensive laboratory testing over the last two decades. In general, these tests were designed to study the effects of specific important considerations. Because of the many parameters involved, laboratory tests do not give sufficient data to allow a comprehensive evaluation of design methods. Analytical techniques to accurately model the behaviour of reinforced concrete have advanced to the stage that a sufficient amount of accurate information can be produced to evaluate new or existing design methods.

Unrestrained slender reinforced concrete columns in braced frames are of particular importance. Most columns in structures are not subjected to significant loads between their ends. Bending is generally introduced by the connecting beams. The general availability of computer facilities and documented programmes for frame analysis has allowed the designer to examine the approximate overall distribution of bending moments. Columns are therefore typically analysed for axial load and moments applied at both ends. Therefore, the continuity of the frame forms the loading mechanism rather than the restraining system. The classical case of buckling of the restrained column occurs when the column deforms under axial load due to unavoidable imperfections in construction and when beams restrain rather than load the column. The importance of restraint in this case is reduced by the fact that good design practice ensures a high probability of plastic rotation in the beams before failure of the columns. This is especially true in the case of columns of the lower storeys of high-rise buildings, where column moments due to high axial loads acting at an eccentricity caused by imperfections can be far greater than the moment capacity of the beams.

The higher requirements for the seismic resistance of concrete structures has tended to decrease the use of unbraced frames. Furthermore, in the case of unbraced frames, the importance of designing for overall stability rather than the stability of individual columns has been recognized to some extent by North American reinforced concrete design codes(5,14). It is of great interest to note that the rational approach of the CSA "Steel Structures for Buildings - Limit States Design"(15), by accounting for overall lateral instability by increasing lateral loads on the structure, results in the design of individual columns as being braced.

A review of existing design methods for slender reinforced concrete columns(47), indicated that many different methods, and variations thereof, are used throughout the World. In North America, the simple Reduction Factor Method(4), has been replaced by the more rational, but more difficult to use, ACI Moment Magnifier Method(5). Previous analytical studies(25,28,72) have indicated a significant conservatism inherent in this method for certain cases. It is believed that no comprehensive study has been made which adequately defines these errors.

1.2 Objectives and Scope

The primary objective of this work is to present a comprehensive study of existing methods of designing slender reinforced concrete columns subjected to uniaxial bending in braced frames. Published reports(25,28,72) have indicated that the present moment magnification method of the ACI and CSA design codes(5,14) is significantly conservative in some cases. It was decided that a more detailed study of these inconsistencies and the presentation of a modification to the method which would lead to greater accuracy would be of significant benefit. A further objective was to investigate the possibility of developing an approximate method which would eliminate much of the difficulty inherent in using the present ACI method as a design tool.

The development of an analytical method to accurately predict the capacity of slender reinforced concrete columns was required. This involved a fairly comprehensive study of the nonlinear behaviour of reinforced concrete including time dependent effects. The analytical model was evaluated by an extensive comparison with available laboratory test results.

A rather large number of analytical results were produced and analysed in order to fully study the effects of each parameter of column properties and loading conditions. The effect of section properties such as steel and concrete strengths, the percentage steel ratio, and the distribution of steel in the member were evaluated. Loading conditions included a range of eccentricities and end moment ratios. The effect of sustained load at various levels was studied for columns throughout the range of slenderness.

The present ACI method was evaluated and a modification was developed to increase accuracy. A simple method using graphs to indicate the moment magnification was developed.

1.3 Literature Review

The available literature on slender reinforced concrete columns is now so vast that a complete literature study would be a formidable task in itself. An attempt is made here to review the work on unrestrained uniaxially loaded slender reinforced concrete columns in braced frames since this was the main interest of this study. A brief introduction to other cases such as restrained columns and frame behaviour is included. The important early works on the phenomenon of buckling by Euler, Engesser, Considère, and von Kármán, and for reinforced concrete by Baumann and Ernst, Hromadik and Riveland are considered well reported and are not included here. An excellent review of their works has been given by Broms and Viest(11). Other material relevant to the general behaviour of reinforced concrete is reviewed in Chapter 2.

In 1958, Broms and Viest(11,12,13) made a most important contribution to the analysis and design of slender reinforced concrete columns and initiated the fairly extensive research which has continued in North America for the past two decades. An analytical method, based on an assumed cosine deflection profile and allowing for the nonlinear behaviour of concrete under short-term loads was developed and evaluated with experimental work. This was used to study the importance of various parameters on column behaviour. The major variables affecting column capacity were identified as the slenderness, the eccentricity, the end eccentricity ratio, the concrete strength, the percentage steel ratio, the yield strength of the reinforcement, and sustained loads. The two modes of failure of slender reinforced concrete columns were identified as instability and material failure(11) and differences between the behaviour of hinged and restrained columns were discussed(12). A study of the cross section parameters indicated that column strength was significantly affected by each parameter. However, it was found that they had a similar effect for both slender and short columns. This led to the concept of a Reduction Factor Method by which slenderness effects are accounted for by simply reducing section capacity(13). This was to become the Reduction Factor Method of 1963 ACI design code(4).

A similar analytical method, suitable for computer application but not requiring an assumed deflection profile, was presented by Chang & Ferguson(16) and compared with tests of six short-term columns loaded eccentrically in single curvature. They pointed out the errors associated with the assumption of a cosine deflection profile at small eccentricities. This numerical method was later modified and used for a study of restrained columns(17) in which the importance of the development of plastic hinges in the beams was pointed out.

A more advanced analytical model was later presented by Pfrang & Siess$^{(63)}$. This was used to further investigate the effects of the various parameters of column cross section and loading conditions for both hinged and restrained columns$^{(62)}$. It was concluded that buckling failures were limited to cases of small eccentricity ratios and that long columns with large eccentricity ratios loaded in double curvature were often not influenced by slenderness effects. The fact that increased slenderness resulted in increased end rotations which, therefore, meant that columns attracted less end moments in frames was discussed. The effect of restraint was found to increase as slenderness and eccentricity increased, and as loading tended to form symmetric curvature.

Experimental tests on columns bent in double curvature by Martin and Olivieri$^{(53)}$ and by MacGregor and Barter$^{(48)}$ confirmed that loading the column in double curvature has a significant effect in strengthening slender columns. A classical example of unwinding, buckling failure for antisymmetrical curvature is well documented by MacGregor and Barter$^{(48)}$.

Experimental studies on the effects of creep have been reported by Goyal & Jackson$^{(34)}$, Drysdale$^{(23)}$, and by Green & Breen$^{(36,37)}$. The tests by Drysdale show excellent examples of creep buckling failures.

Many analytical methods have been developed which account for sustained load effects$^{(18,23,51,72)}$. Drysdale$^{(23)}$, in particular, modelled section behaviour by dividing the cross section into strips, or a grid in the case of biaxial bending, and accounted for creep by using a modified creep superposition method and discreet time intervals.

Sallam(72) incorporated a Newton-Raphson method for finding the cross section strain distribution and used a stiffness matrix method for frame modelling.

Lateral load tests on frames with slender columns by Ferguson and Breen(27) indicated the importance of beam properties on column behaviour and frame capacities. They also showed that the reduction of column capacity due to lateral load can be significant. Other experimental tests on frames with columns in single curvature by Furlong and Ferguson(31) showed that beam properties were of lesser importance. Experimental tests by Blomeier and Breen(7) showed that the development of plastic hinges in the beams had a significant effect on frame behaviour.

A review(52) of both the design method of the 1963 CEB Recommendations and the ACI Reduction Factor Method(4) showed that the two methods gave significantly different results in many cases. The CEB method was found to give results slightly on the unsafe side for single curvature cases. The ACI Reduction Factor Method was found to be quite conservative in many cases of single curvature but slightly unsafe in many cases of double curvature.

A paper by Parme(60) in 1966 introduced a rational moment magnification method which depended on the ratio of axial load to the critical buckling load of Euler. A table of coefficients for calculating stiffness depended on the section properties and the level of the axial load.

The present ACI Moment Magnifier Method was presented by MacGregor, Breen, Pfrang(49) in 1970. Values of the stiffness parameter, EI, could be calculated in two ways, one of which depended on concrete properties only. The method has been shown to give quite conservative results in some cases(25,28,72). Recent statistical studies over the range of parameters(50,57) have indicated that it will not be simple to make any significant improvement to its accuracy. MacGregor, Oelhafen, Hage(50) have documented the inadequacy of the second equation for EI, which does not depend on steel properties and recommend its exclusion from the ACI Moment Magnifier Method. A modification to the method of accounting for creep has also been suggested(50).

The effect of slenderness on reducing column stiffness in frames and the general effect of column stiffness relative to beam stiffness has been studied by Breen, MacGregor, Pfrang(9) and Pagay, Ferguson, Breen(58), in particular, suggest that the equivalent effective length of unbraced columns may be approximately computed on the basis of column stiffnesses determined by the longer of the EI equations used in the ACI Moment Magnifier Method and beam stiffness based on cracked transformed sections.

1.4 Report Presentation

The behaviour of concrete has a significant effect on the capacities of slender reinforced concrete columns. Chapter 2 contains a review of the factors which may influence this behaviour. A relationship which describes the appropriate stress - strain behaviour of concrete for columns is presented. Time effects, such as creep, shrinkage and aging effects on strength are discussed.

The analytical model used to predict column capacities in this investigation is described in Chapter 3. A study of the sensitivity of the results of the analytical method to its inherent numerical features and to assumptions of concrete behaviour is reported in Chapter 4. A comparison of analytical results with reported laboratory tests on slender reinforced concrete columns is included in Chapter 4.

A direct method for designing slender columns, using graphs to describe the moment magnification required for safe design, is presented in Chapter 5. The accuracy and limitations of this method are discussed. A description of the range of section parameters and loading conditions for the columns studied in this investigation is included in Chapter 5.

Chapter 6 contains a study of the accuracy of the present ACI Moment Magnifier Method. A more complex expression to estimate section stiffness for use in this method, which increases accuracy in the analysis of slender columns is presented. Chapter 6 also includes discussions on other topics of slender reinforced concrete design and some recommendations for future study.

The conclusions resulting from this investigation are reviewed in the final chapter.

CHAPTER 2

BEHAVIOUR OF CONCRETE

2.1 Introduction

In attempting to model the behaviour of any reinforced concrete element under load, a concrete stress - strain relationship must be established. In the early stages of the change to the concept of Ultimate Strength Design, the importance of this relationship was generally undermined by the fact that the majority of attention was focused on the strength of under-reinforced beams(74,84) and concentrically loaded columns(1,74); two cases in which the stress - strain relationship is of minimal importance. As tests continued on over-reinforced beams(21,45,75,76) and eccentrically loaded columns(40,67), interest in the stress - strain relationship increased. When deflection considerations became important with the advent of higher strength steels, better design methods and the desire for long span members, the importance of a more accurate representation of concrete behaviour, including time effects, became obvious.

The behaviour of the slender column is a particularly significant case in that capacity is affected by the deflections. Therefore, analysis of columns must accurately incorporate concrete behaviour. To this end, concrete stress - strain relationships, including time effects, are discussed in this chapter.

2.2 Short-term Concrete Stress - Strain Behaviour

Figure 2.1 represents a typical stress - strain curve obtained by loading a concrete cylinder in concentric compression(41). Characteristic features are an almost linear portion up to about 30% of the maximum stress, f_c', a gradual curving from about 30% to 80% of the maximum stress, a sharply increased curvature from about 80% of the maximum stress to the maximum, and a descending branch thereafter.

On the basis of cylinder tests, many researchers have suggested that a limiting strain is the appropriate failure criterion for concrete. Others have recognized that an ultimate strain far in excess of that found in conventional cylinder tests can be developed and that failures observed in cylinder tests are related to the stiffness of the testing machine. Failure occurs when the specimen looses strength quicker than the testing machine can dissipate its stored energy. By using suitably stiff testing machines or by loading the concrete specimen in series with a stiffer element, complete stress - strain curves, with descending branches well beyond the maximum load, have been observed(85). Blanks and McHenry(6), in particular, have reported strains in the order of 0.008 in./in. while testing 3" X 6" cylinders in series with a system of disk springs. The results of these tests are reproduced in Fig. 2.2.

Figure 2.3 shows the stress - strain relationship when unloading prior to attaining maximum stress is included(64). It is seen that only part of the deformation is recovered on unloading. Thus, concrete deformation under load consists of elastic and permanent deformations.

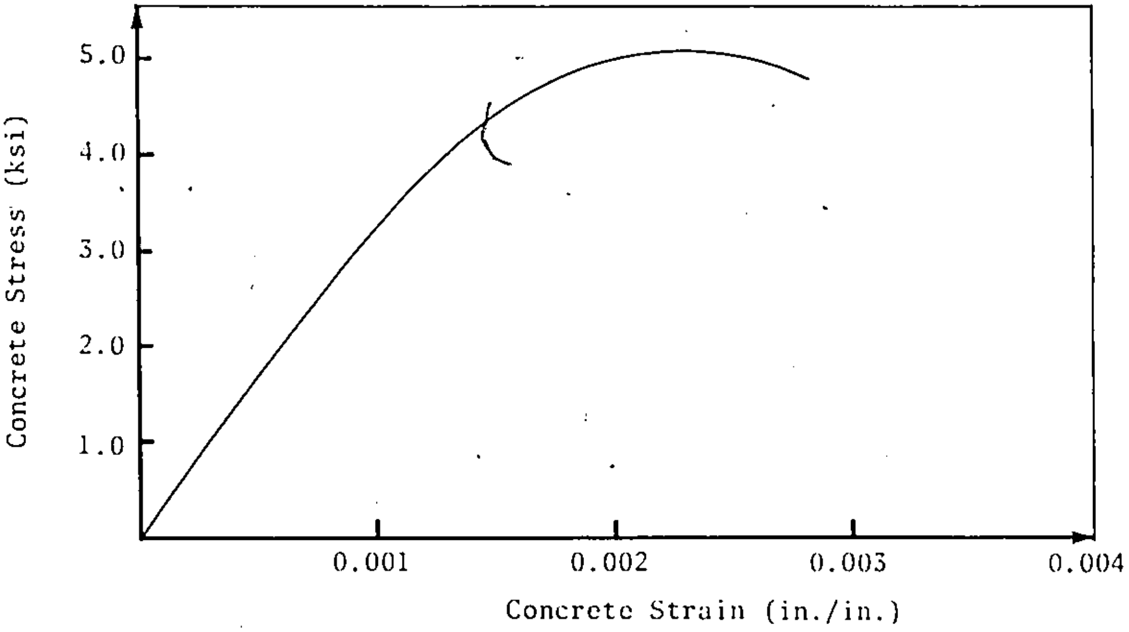

Fig. 2.1 TYPICAL CONCRETE STRESS - STRAIN CURVE FROM CYLINDER TEST

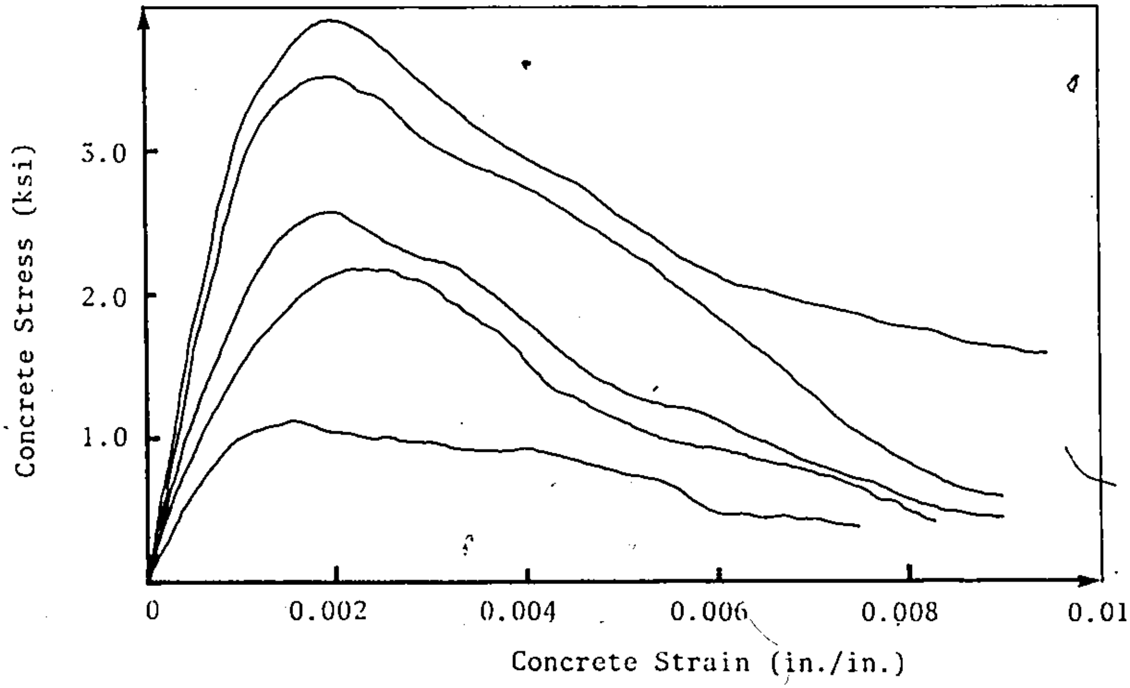

Fig. 2.2 CONCRETE STRESS - STRAIN CURVES FROM RESTRAINED CYLINDERS (Reproduced from Reference 6)

It has long been thought that the shape of the stress - strain curve is related to microcracking (64,41). More recent studies at Cornell University (42,73,78) revealed that a close relationship does exist between the shape of the stress - strain curve and the type and extent of microcracking. It has been shown that cracks between aggregate and mortar exist prior to loading but that their increase is slight at loads lower than 30% of the maximum load. Above this, these cracks increase giving the characteristic gradually decreasing slope of the stress - strain curve. Cracks through the mortar begin to increase noticeably and form continuous crack patterns at about 80% of the ultimate load. This correlates well with the increased curvature and volume expansion that occurs at this stage. As cracks continue to propogate, the load carrying paths decrease and the capacity peaks and then declines. The descending branch represents a highly cracked state but some load carrying paths still exist.

Any factor which influences microcracking can also be expected to affect the shape of the stress - strain curve. The composition of the concrete can affect its cracking tendency differently than its strength and a stress - strain curve based solely on concrete strength is at best an approximation. It has been shown that the amount and size of aggregate, in particular, have a pronounced effect on the relationship (32,33). Furthermore, additional crack arrestors or retarders, such as reinforcing steel, and transverse and longitudinal strain gradients,

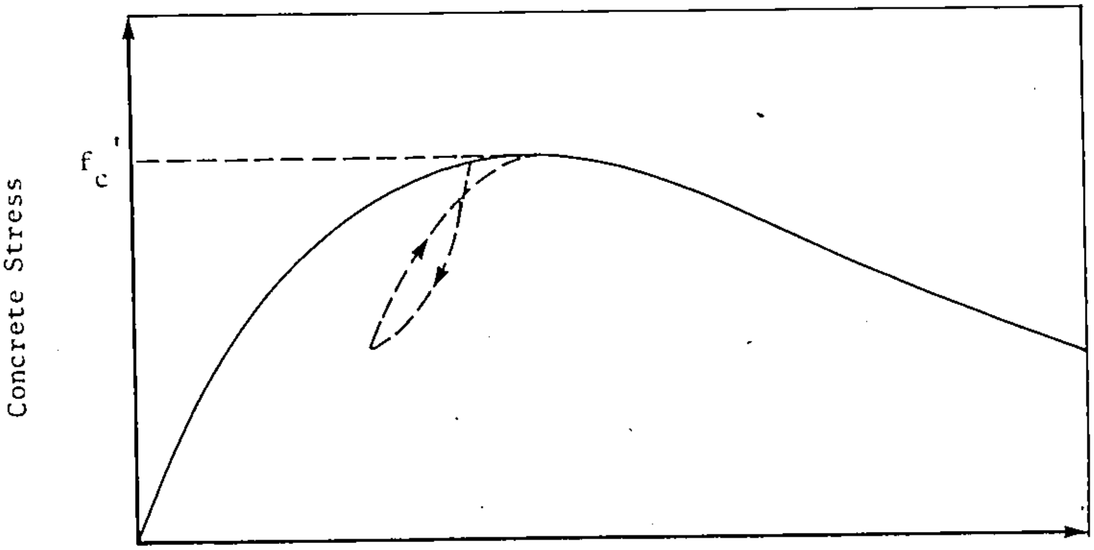

Fig. 2.3 CONCRETE STRESS - STRAIN CURVE WITH UNLOADING AND RELOADING PATHS (Reproduced from Reference 64)

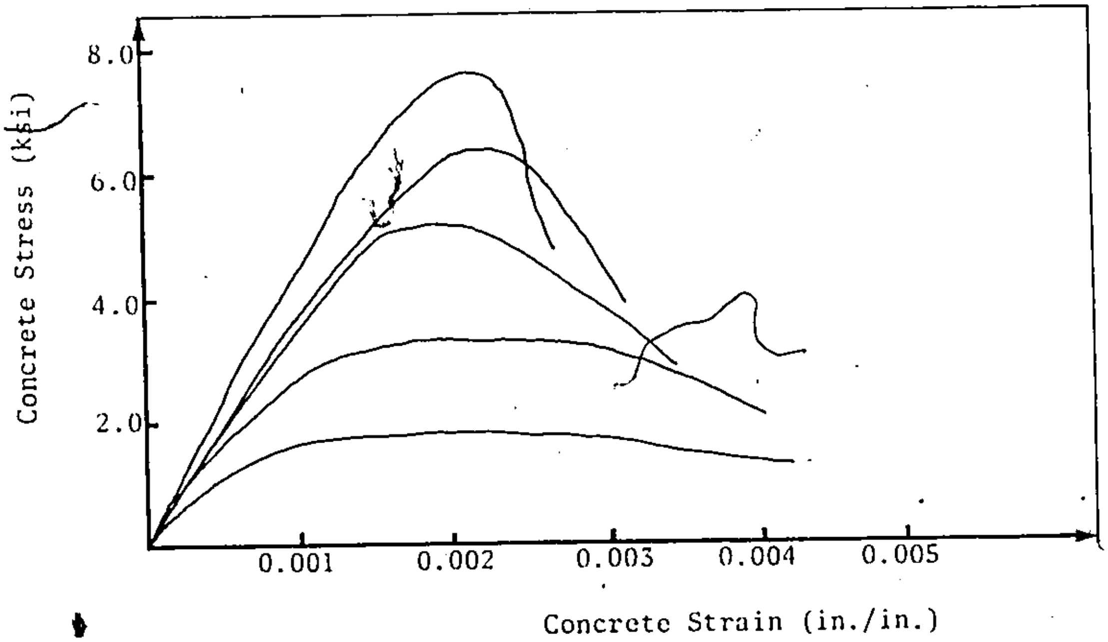

Fig. 2.4 CONCRETE STRESS - STRAIN CURVES SHOWING THE EFFECT OF STRENGTH ON NONLINEARITY (Reproduced from Reference 26)

which are present in reinforced concrete under nonuniform loading, might be expected to have some effect on the stress - strain behaviour of concrete(42).

2.3 Factors Affecting Concrete Stress - Strain Behaviour

As mentioned in the previous section, there are many factors which merit consideration in developing a stress - strain relationship for concrete. The effects of concrete composition and time rate of loading occur in standard cylinder tests. Other factors such as strain gradients, casting methods, and effects of reinforcement are more relevant to reinforced concrete members. Long-term effects such as strength gain, shrinkage, and creep are important in predicting structural performance. (Creep and shrinkage are reviewed in later sections of this chapter.)

2.3.1 Concrete Composition: The composition of concrete affects the type of propogation of internal cracking and, therefore, affects the concrete's stress - strain behaviour and strength. The effect of the water - cement ratio on strength is evident from the long established "Abram's law"(32). Gilkey(32) has shown that aggregate has an important effect on the shape of the stress - strain curve, and also, is a sizeable factor in determining concrete strength. Gilkey and Murphy(33) reported that an increase in the amount and size of aggregate increased the non-linear behaviour of concrete, and that the water - cement ratio, curing, and age at loading introduced little, if any, difference to this. The test results of Hognestad, Hanson, McHenry(41) tend to confirm these conclusions.

For practical mixes of similar workability, higher strength concretes have lower aggregate contents. Therefore, the effect of aggregate has often been recognized indirectly by the assumption that nonlinearity is related to concrete strength. Figure 2.4 reproduced from reference 26 shows this effect. It is of interest to note that the American and Canadian concrete codes(5,14) indirectly recognize this effect by using a nonlinear formula for the secant modulus of elasticity and by altering the rectangular stress block for concretes with compressive strengths in excess of 4 ksi.

2.3.2 Loading Time: When concrete is loaded and the immediate deformation has taken place, creep and delayed microcracking act together to cause a time dependent deformation. It is thus logical to expect the loading rate to affect the stress - strain curve. Rüsch(70) has shown that with a decreasing strain rate, the value of maximum stress reached decreases and the strain at which maximum stress is reached increases.

It has become usual to define short-term behaviour as that occurring during or shortly after application of load, and later effects as long-term effects. Usually, the maximum time taken in testing cylinders and other members is less than an hour. Testing times that differ appreciably from this will have an effect on strains.

2.3.3 Flexural Effects: A question has often been raised concerning the validity of applying stress - strain curves from cylinder tests to problems of bending. There are two major differences between concrete under axial load and under flexure. Rüsch(70) pointed out that the time rate of straining affects the stress - strain curve, and since regions of a specimen under flexure are subjected to different strain rates, he suggested that the stress - strain curve for axial load is not truly applicable to flexure. The curve suggested by Rüsch, however, does not, differ significantly from the usual curves obtained from cylinder tests.

It has often been suggested that a strain gradient should affect the stress - strain curve due to a restraining effect of less highly strained fibres. Sturman, Shah, Winter$^{(78)}$ found that strain gradients do inhibit microcracking, especially when the concrete is highly stressed. They suggested that strain gradients increase the strength and significantly increase the strain at which maximum stress occurs, but they indicated ~~that there~~ is little effect below a strain of 0.0017 in./in. This does not agree with the finding of Clark, Gerstle, Tulin$^{(19)}$, who concluded that strain gradients affect only the descending branch of the stress - strain curve.

Hognestad, Hanson, McHenry$^{(41)}$ used a numerical technique to obtain flexural stress - strain curves from eccentrically loaded specimens and compared these to curves obtained from cylinder tests. A remarkable similarity was found between both sets of curves. However, the comparison did not extend into the descending branch since the cylinders failed abruptly soon after maximum stress was reached due to the lack of stiffness of the testing machine. For the flexural tests, the stress - strain curves showed more complete descending branches.

In summary, it would appear that the stress - strain relationships obtained from cylinder tests, with due allowances for the descending branch, are applicable to flexure(41). Any effects of flexure appear to be confined to high strain levels, causing increased strains and greater ductility. These effects are of minimal importance since the strength of a reinforced concrete member is not significantly altered by changes in concrete behaviour at high strain levels.

2.3.4 The Effect of Reinforcement: Reinforcement can affect concrete behaviour basically in two ways. The effect of ties in providing lateral confinement on the concrete has been the topic of much research. It is well known(55) that concrete achieves greater strength under a triaxial stress condition and that this can occur in a concrete specimen that is highly restrained by lateral steel(59). It is known that closely spaced spirals will increase the strength of the concrete within its core(1). Rectangular ties, however, have a lesser effect because of bending effects and it is generally accepted that rectangular ties as used in practice provide little, if any, effect on concrete strength(61). They can, however, increase section ductility after spalling of the shell concrete occurs(59).

Another effect of reinforcing steel is to separate the face concrete from the core by providing a weaker shear plane. This may lead to spalling which is more common when large numbers of bars are used or in columns with closely spaced spirals(66). It is not a problem with rectangular tied columns normally found in practice(40).

2.3.5 Method of Concrete Placement: Concrete in poorly compacted members has less strength than for companion cylinders. Nonuniform compaction of vertically cast columns can cause a differential in concrete quality along the column length. Also, even a moderate water gain through bleeding will decrease the strength of the concrete in the upper part. A strength differential with height has been found in a study of columns in existing buildings(24,80). Hognestad(40) reported an unmeasured but obvious differential in columns cast in the laboratory.

Compaction and water gain effects are difficult to assess since they involve many variables including the undefinable human element. It can be argued that differences between laboratory and site conditions are incorporated by the code capacity reduction factors. However, in comparing one set of tests with other tests or with an analytical solution, a significant factor, namely casting position, should be considered. For convenience of concrete placement, many investigators have cast test specimens in a horizontal position. This eliminates the effects of concrete compaction and may eliminate the effect of water gain depending on workmanship and on whether the top casting face becomes the tension face of the specimen.

2.3.6 Strength Gain with Age: Because concrete gains strength as hydration continues, it is recognized that an appreciable gain in strength can occur past the 28 day strength. The British Code of Practice(10) allows a 24% increase at 1 year over the 28 day strength for normal concretes. Drysdale recorded 9% to 24% increases over the 28 day strength at ages of about six months(23).

The amount and rate of strength gain after 28 days depends on the type of cement, the composition of the concrete, the curing conditions, and the environment. These factors have not yet been fully researched and prediction of strength gains remains a rough approximation. Fortunately, the percentage gain in strength after 28 days is small enough to allow such approximations without serious error.

Branson and Christiason(8) have suggested a strength - time relationship in the form

$$(f_{co})_t = \frac{t}{A + Bt} \quad (f_{co})_{28} \qquad \ldots. (2.1)$$

where t is the age of the concrete and A and B are constants defining the curve.

Obviously, A can be found in terms of B in that

$$\frac{28}{A + 28B} = 1 \qquad \ldots. (2.2)$$

The maximum amount of strength gain over the 28 day strength can be found in terms of B by substituting infinity for t. Thus, the maximum strength gain as a percentage of the 28 day strength equals 100 X (1/B - 1). For the purposes of predicting capacities of the columns studied in this investigation, this value was assumed to be 10%. Thus, the strength - time relationship becomes, with B equal to 0.9091:

$$(f_{co})_t = \frac{t}{28 + B\ (t - 28)} \quad (f_{co})_{28} \qquad \ldots. (2.3)$$

Equation 2.3 gives a good approximation in predicting the gain in strength of normal concretes over the 28 day strength. It is not believed to be sufficiently refined for use in predicting 28 day strength on the basis of 7 day tests.

2.4 Development of a Concrete Stress - Strain Curve

Figure 2.5 shows normalized stress - strain curves proposed by various writers. The equations of these curves and the suggested strain at maximum stress, ε_{co}, values are given in Table 2.1. The differences between the curves are a result of the many influencing factors involved. To date, no single stress - strain relationship can be identified as being used by the majority of researchers. An equation to represent the stress - strain relationship is developed herein on the basis of reported cylinder and flexural tests with a modification to account for the rate of loading effects.

The shape of the normalized stress - strain curve can be represented by a simple polynomial of the fourth order$^{(23)}$. The stress - strain equation is then expressed by

$$f_c = f_{co}\ (Ax^4 + Bx^3 + Cx^2 + Dx) \qquad \ldots. \ (2.4)$$

where $x = \varepsilon_c/\varepsilon_{co}$

f_{co} = maximum stress

A, B, C, & D are constants defining the curve.

Of the four conditions needed to solve for the constants, two are readily found in

$$f_c = f_{co} \quad \text{when} \quad x = 1$$

$$\frac{\partial f_c}{\partial x} = 0 \quad \text{when} \quad x = 1$$

The other two can be created by fixing two points on the curve. The values f_c/f_{co} for $\varepsilon_c/\varepsilon_{co}$ of 0.5 and 1.5 are good choices since they control both the ascending and descending regions of the curves.

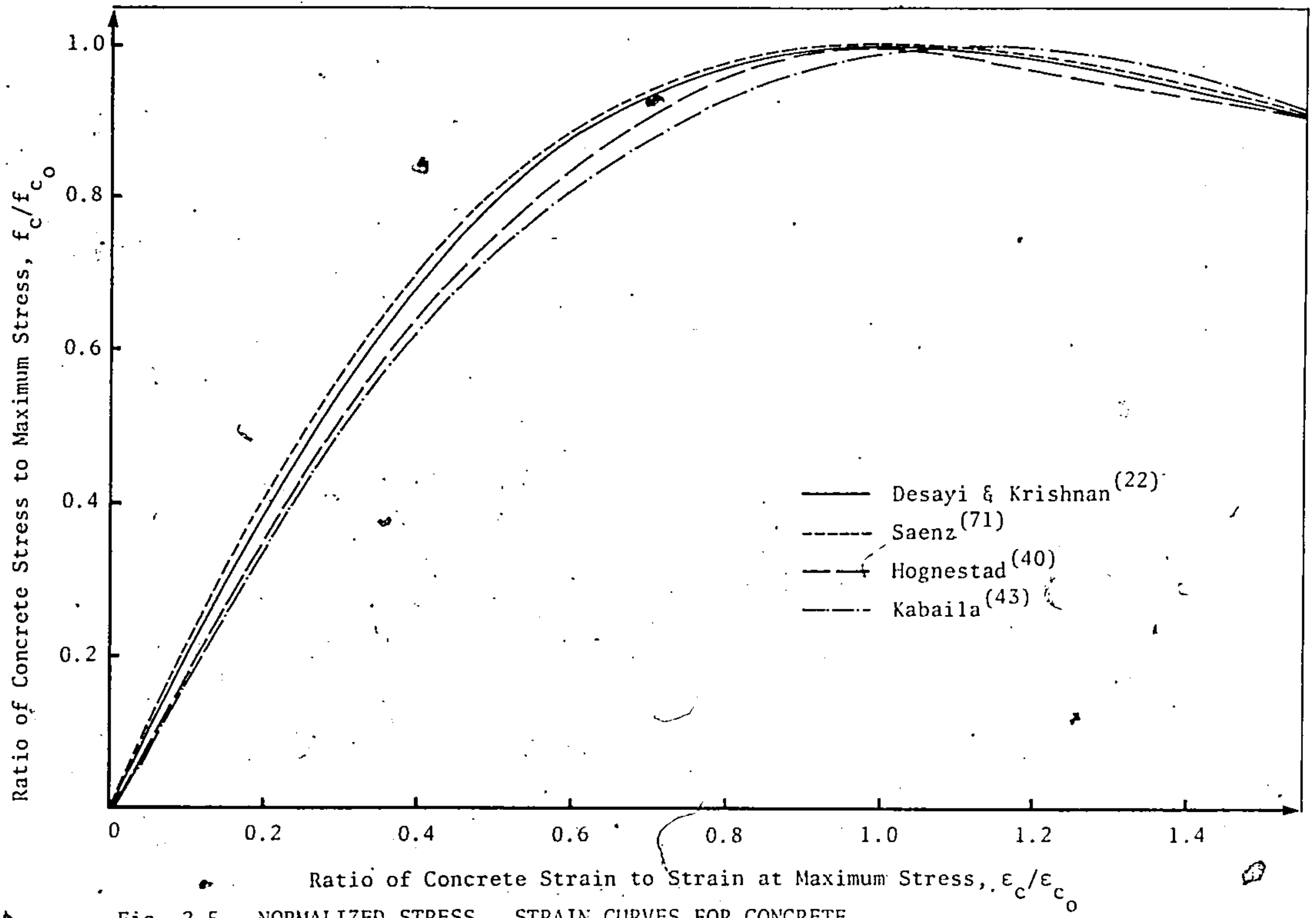

Fig. 2.5 NORMALIZED STRESS - STRAIN CURVES FOR CONCRETE

TABLE 2.1 EQUATIONS TO REPRESENT THE STRESS - STRAIN RELATIONSHIP OF CONCRETE

REFERENCE	EQUATION FOR THE STRESS - STRAIN CURVE	EQUATION PARAMETERS
Desayi & Krishnan(22)	$f_c = \dfrac{E_c \; \varepsilon_c}{1 + (\dfrac{\varepsilon_c}{\varepsilon_{co}})^2}$	$\dfrac{E_c}{f_{co} \; \varepsilon_{co}} = 1$
Saenz(71)	$f_c = \dfrac{E_c \; \varepsilon_c}{1 + (\dfrac{E_c}{E_{co}} - 2) \dfrac{\varepsilon_c}{\varepsilon_{co}} + (\dfrac{\varepsilon_c}{\varepsilon_{co}})^2}$	$E_{c_s} = f_{co}/\varepsilon_{co}$ $f_c = \dfrac{\sqrt{f_{co}}}{1 + 0.006 \sqrt{f_{co}}}$ $\varepsilon_{co} = 10^{-5} \; f_{co}^{\;0.25} \; (31.5 - f_{co}^{\;0.25})$
Hognestad(40)	$f_c = f_{co} \; \{2 \dfrac{\varepsilon_c}{\varepsilon_{co}} - (\dfrac{\varepsilon_c}{\varepsilon_{co}})^2\}$	$\varepsilon_{co} = 2 \; f_{co}/E_c$ $E_c = 1.8 \times 10^6 + 460 \; f_{co}$
Kabaila(43)	$f_c = f_{co} \; \{2.0x - 1.189x^2 + 0.1763x^3 + 0.0027x^4\}$	$x = \varepsilon_c/\varepsilon_{co}$ $\varepsilon_{co} = 2 \; f_{co}/E_{co}$

NOTE: All values of E_c and f_c in this Table are in psi.
$E_{co} = f_{co}/\varepsilon_{co}$

Figures 2.6 and 2.7 show values of f_c/f_{co} for $\varepsilon_c/\varepsilon_{co}$ of 0.5 and 1.5 plotted against f_{co}, as derived from reported cylinder and flexure tests. The decrease of these values with concrete strength is strikingly apparent. A general equation to represent concretes of all strengths should, therefore, incorporate a normalized stress - strain curve which has concrete strength as a variable. However, because the columns in this study were limited to concrete strengths between 3 ksi and 5 ksi, this effect was ignored and an equation representative of 4 ksi concrete was used throughout. For this concrete, Fig, 2.6 and 2.7 indicate average values of

$$f_c = 0.78\, f_{co} \qquad \text{when } x = 0.5$$

$$f_c = 0.85\, f_{co} \qquad \text{when } x = 1.5$$

Figure 2.8 shows values of ε_{co}, from the same tests, plotted against concrete strength. A large scatter of the results and a slight increase with concrete strength are apparent. A value of 0.002 represents the average ε_{co} for a 4 ksi concrete strength. Using these, the equation representing the concrete stress - strain relationship can be defined for a typical 10 to 20 minute loading time.

It is known, however, that the shape of the stress - strain curve varies with the rate of loading. It is difficult to estimate a typical loading to failure time for structures but it is thought to be in the range of hours rather than in minutes. Rüsch(70) has presented stress - strain curves for eccentric compression, developed by a numerical analysis of cylinder tests, for various loading rates. A comparison of the curve for a one hour loading time with that for ten minutes shows

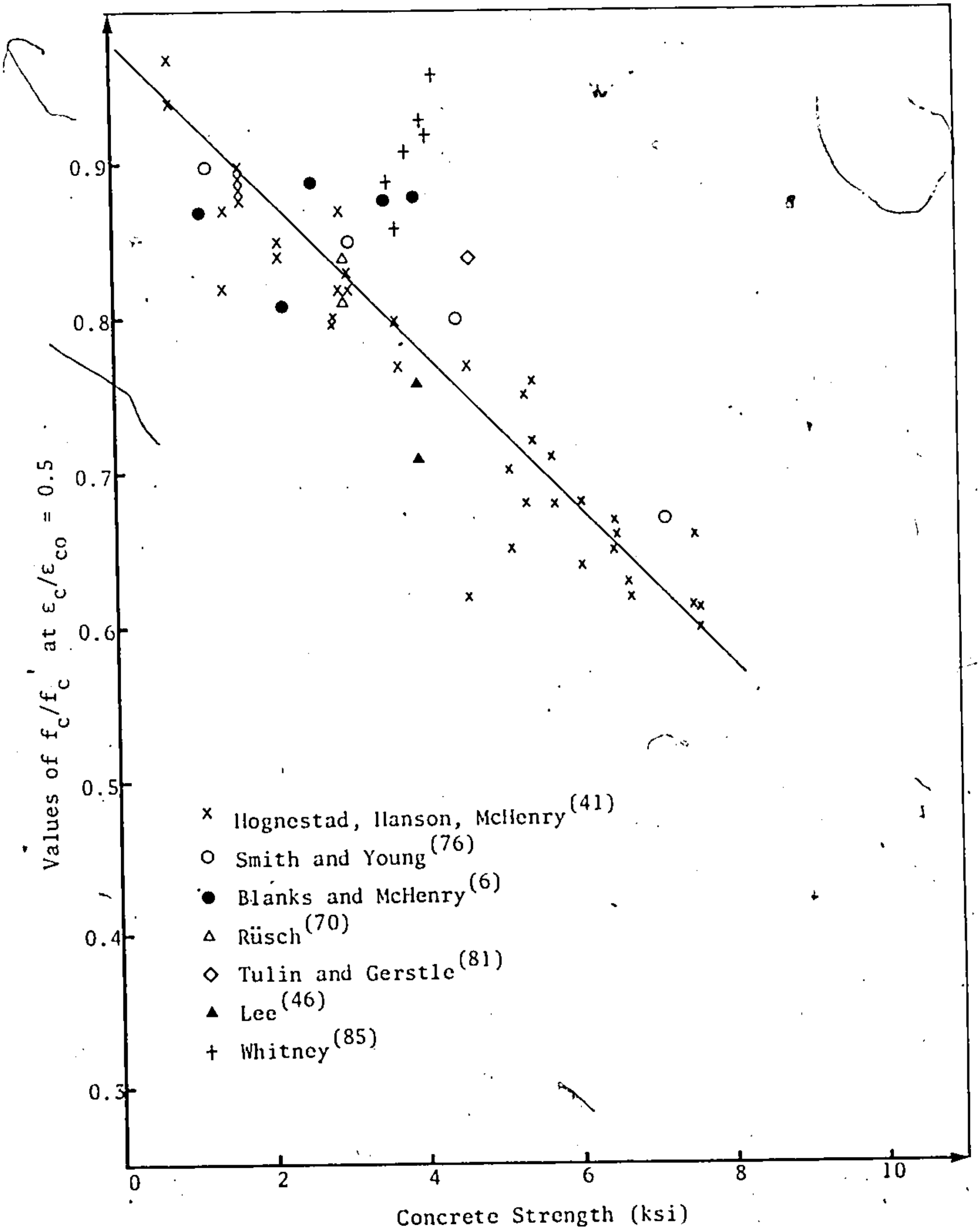

Fig. 2.6 EFFECT OF CONCRETE STRENGTH ON THE ASCENDING REGION OF THE STRESS - STRAIN CURVE

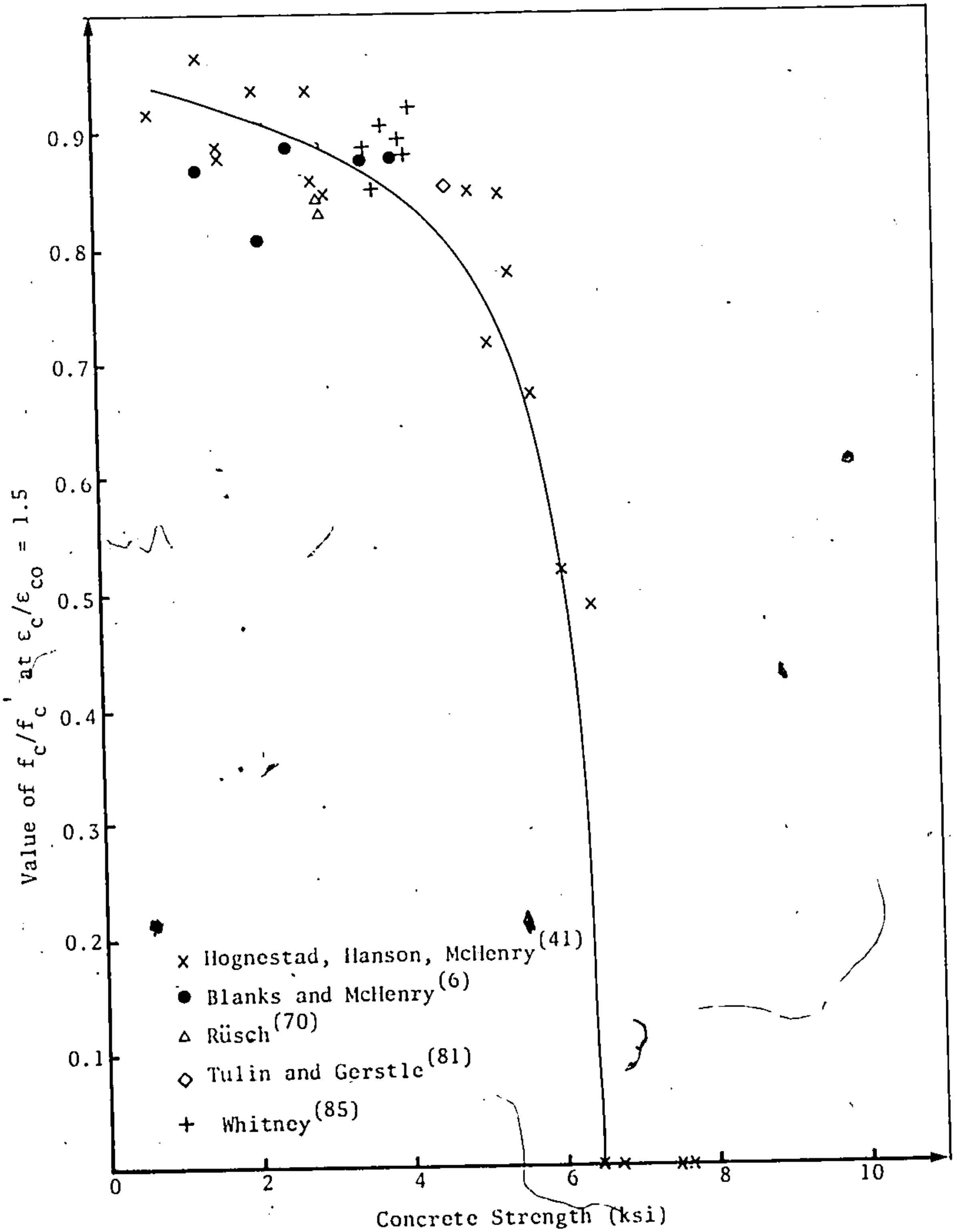

Fig. 2.7 EFFECT OF CONCRETE STRENGTH ON THE DESCENDING REGION OF THE STRESS - STRAIN CURVE

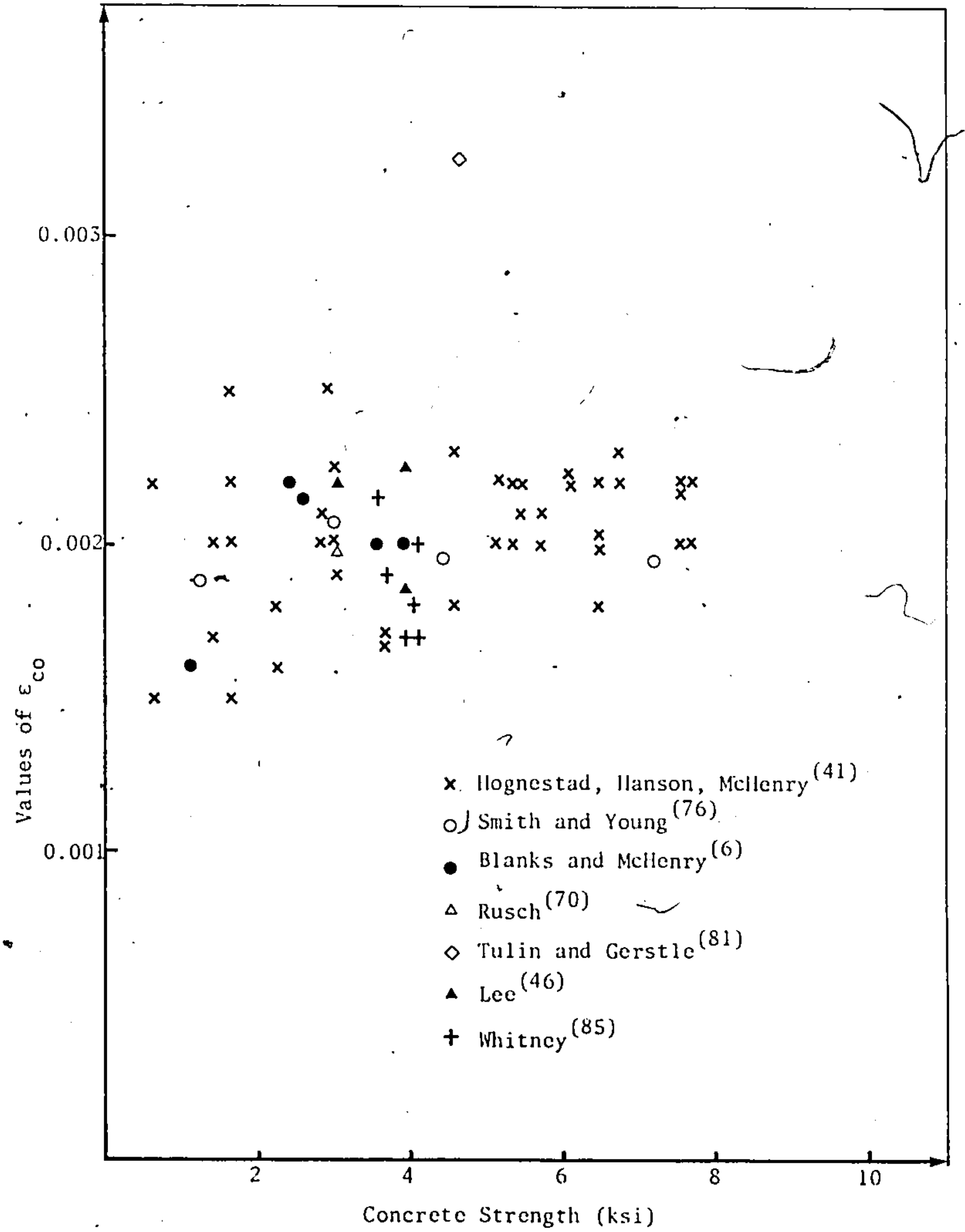

Fig. 2.8 STRAIN AT MAXIMUM STRESS VERSUS CONCRETE STRENGTH

that ε_{co} increases by about 10% and that f_c/f_{co} for $\varepsilon_c/\varepsilon_{co}$ of 0.5 increases by about 3%. With these modifications, the value of ε_{co} becomes 0.00225 and f_c/f_{co} for $\varepsilon_c/\varepsilon_{co}$ of 0.5 is found to be very close to the value given by Drysdale's equation(23).

Rüsch's curves also indicate a decrease in the value of f_c/f_{co} for $\varepsilon_c/\varepsilon_{co}$ of 1.5 with an increase in loading time. Furthermore, it is recognized that the descending branch of the curve is highly variable because of the extensively cracked state of the concrete. Assuming f_c/f_{co} of 0.8 for $\varepsilon_c/\varepsilon_{co}$ of 1.5 is not particularly conservative in terms of determining the strength of concrete at these high levels of stress. (The sensitivity of the analysis to the exact shape of the descending branch is discussed in Chapter 4.)

A stress - strain curve to be used for structural analysis and for simulating member tests, can then be derived from

$f_c = f_{co} \times 0.813$ when $x = 0.5$ (to agree with the value of Drysdale's equation)

and $f_c = f_{co} \times 0.8$ when $x = 1.5$

where $x = \varepsilon_c/0.00225$

This gives the equation

$$f_c = f_{co}\,(-\,0.3775\,x^4 + 1.4548\,x^3 - 2.7769\,x^2 + 2.6997\,x) \quad \ldots (2.5)$$

Because Equation 2.5 is not valid for very high strains, the extreme descending region of the curve is replaced by a straight line from the curve at x equal to 1.5 to zero at x equal to 3.0. The accuracy of this straight line is not important since the effective strains at maximum capacity do not exceed x = 1.5 to any great extent. However, its incorporation is important when using a numerical convergence technique since at very high strain Equation 2.5 tends to infinity.

A far greater discrepancy between the stress - strain curves used by researchers lies in the correlation between f_{co} and the cylinder strength, f_c'. There is reason to expect that the two values differ since different loading conditions, restraining effects, concrete placement methods, and size effects exist. The ratio f_{co}/f_c' is usually assumed to ~~be~~ either 0.85 or 1.0. Based on an analysis of reported over-reinforced beam and short column tests, described in Appendix A, it is shown that the value of 0.85 is a reasonably accurate average of this ratio.

Figure 2.9 shows a comparison between the stress - strain curve found to be typical of a cylinder test and the corresponding relationship used throughout this work in analysing reinforced concrete columns.

2.5 Concrete Shrinkage

Shrinkage of concrete is caused by the loss of adsorbed water to the atmosphere. The amount and rate of shrinkage depend mainly on the amount and stiffness of the aggregate, the water - cement ratio, the relative humidity and temperature of the surrounding air, and the size and shape of the specimen[3,55]. Shrinkage increases with time at a decreasing rate for unsaturated concretes.

Although shrinkage has little effect on the sectional capacity of reinforced concrete members, it does tend to increase deflections and should be considered in slender column analyses.

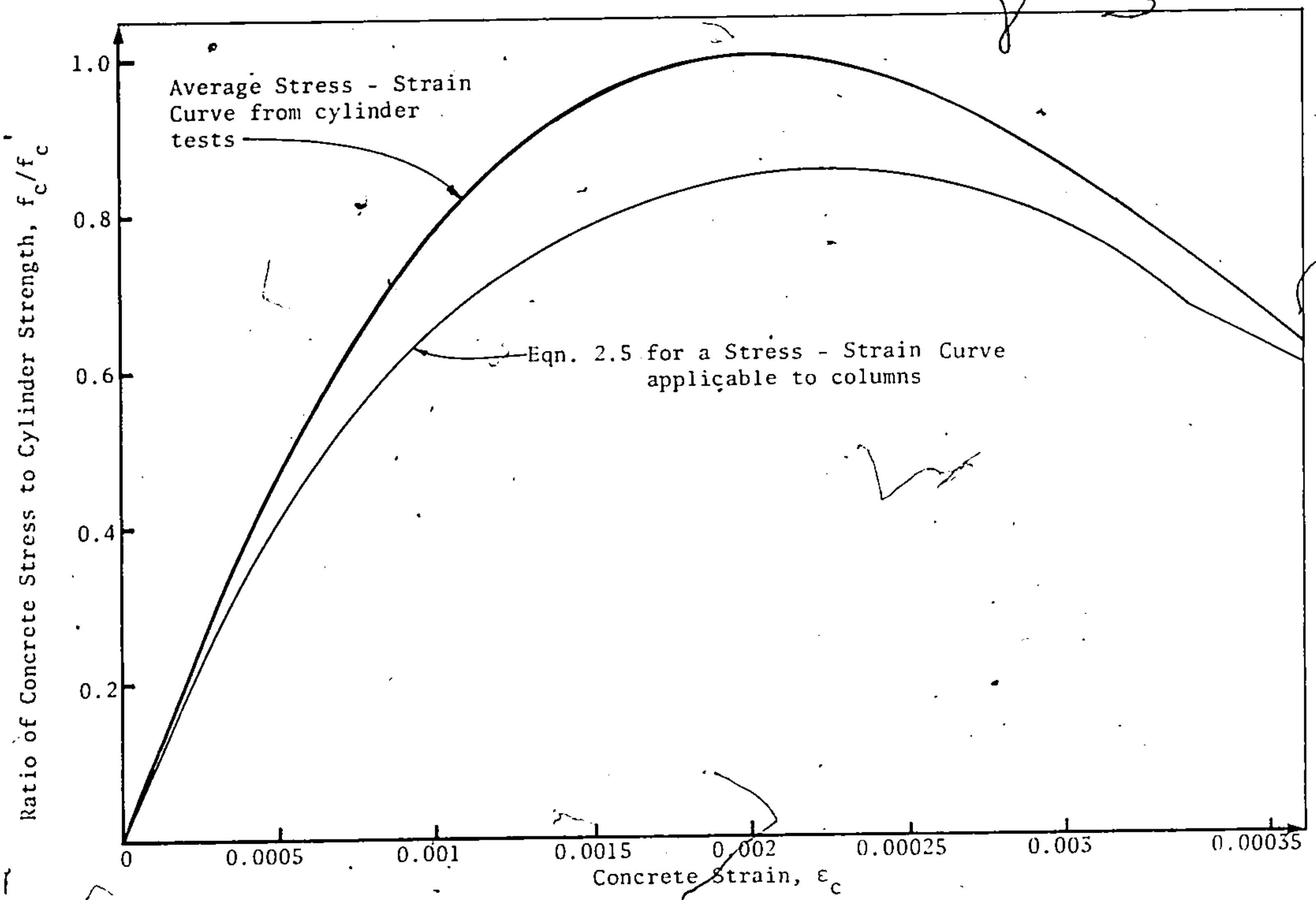

Fig. 2.9 COMPARISON OF CONCRETE STRESS - STRAIN CURVES FOR CYLINDERS AND COLUMNS

The prediction of shrinkage on a basis other than shrinkage measurements remains a crude approximation. However, such prediction methods are the only practical methods available at the design stage. The ACI Committee 209(2), on the basis of research at the University of Iowa(8,54), has proposed a shrinkage prediction method based on wet concrete properties, member size and the relative humidity of the surrounding air. This method is regarded as being the best empirical method available but the degree of inaccuracy inherent in estimating shrinkage on the basis of wet concrete properties must be noted. ACI Committee 209 reported discrepancies in the range of ± 50%.

A comparison of this prediction method with the shrinkage results reported by Drysdale(23) is shown in Fig. 2.10. The method proposed by ACI Committee 209 shows good accuracy in predicting the test results and is used in this work in column strength prediction when shrinkage data is not available.

According to ACI Committee 209, shrinkage at any time after 7 days for moist cured concrete with a 2.7" slump, cement content of 705 lbs./yd.^{3}, percent fines of 50%, and air content of 6%, under a relative humidity of 40% and in a member of less than 6" width can be given by

$$(\varepsilon_{sh})_t = \frac{t}{35 + t} \quad \varepsilon_{shu} \qquad \ldots. \ (2.6)$$

where $\varepsilon_{shu} = 800 \times 10^{-6}$

and t is the time after 7 days in days.

Shrinkage of other moist cured concretes under other conditions is assumed to follow the shrinkage - time relationship of Eqn. 2.6 but

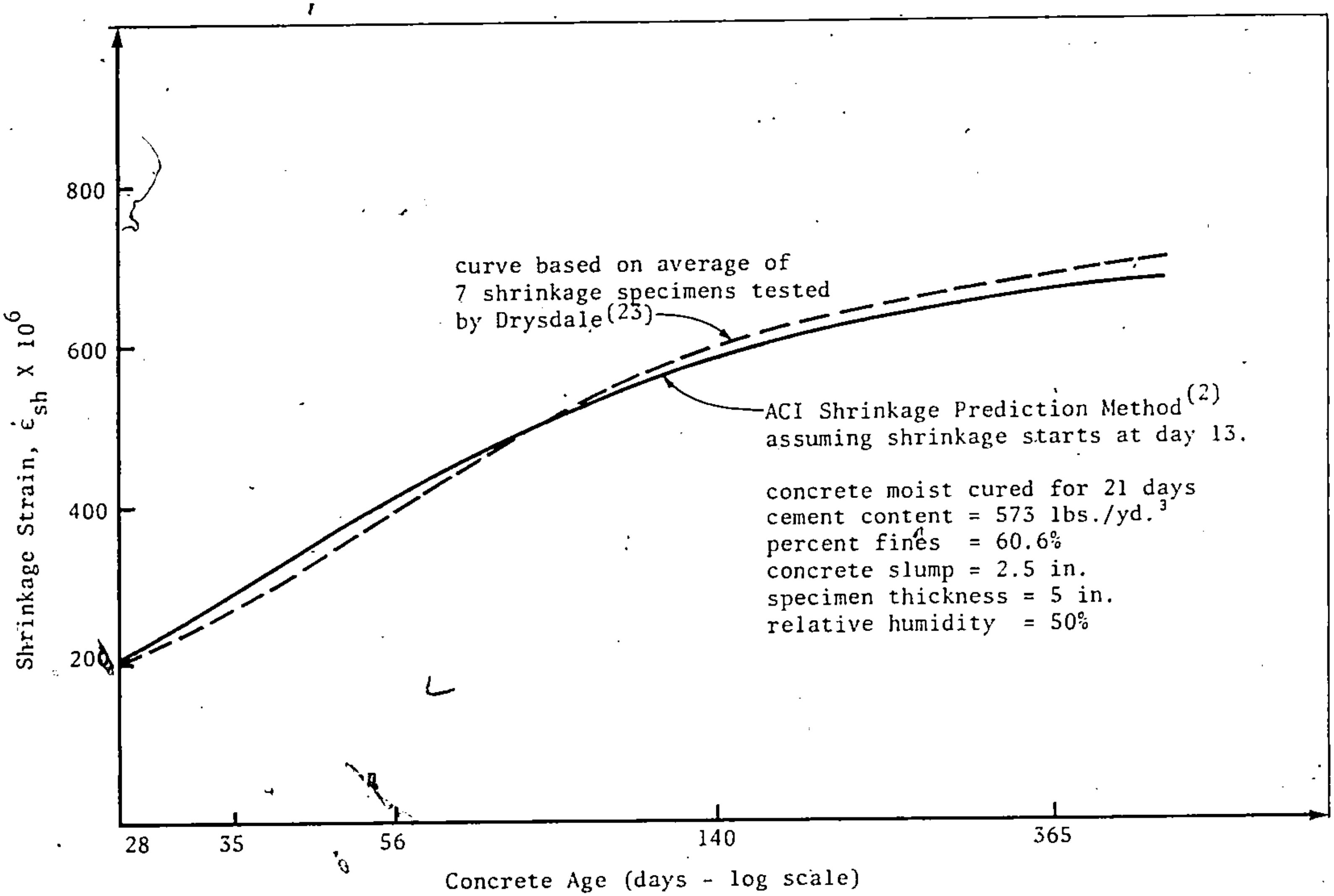

Fig. 2.10 COMPARISON OF ACI SHRINKAGE PREDICTION METHOD WITH TESTS BY DRYSDALE

the amount of shrinkage is altered by applying various factors to ε_{shu}.

In predicting shrinkage values for the column studied in this thesis, the PCA publication "Design and Control of Concrete Mixes"(65) was first used to estimate typical concrete mixes for concretes of 3 ksi to 5 ksi. A slump of 3" was assumed, a relative humidity of 40% was taken, and the width of the member was assumed to be 12 in. Concrete was considered to be moist cured for 7 days and loaded at 28 days. For these conditions the value of ε_{shu} was estimated at 515 X 10^{-6} in./in.

In summary then, shrinkage of the columns studied in this thesis was approximated by

$$(\varepsilon_{sh})_t = \frac{t}{35 + t} \times 515 \times 10^{-6} \quad \ldots\ldots (2.7)$$

where t is the time after 7 days in days.

2.6 Creep of Concrete

It has been mentioned that the stress - strain relationship for concrete is affected by time. This is mainly due to the creep of concrete under load, caused by internal movement of adsorbed water, delayed microcracking and possibly a sliding between gel particles(55).

It is difficult to determine exactly when the instantaneous response of concrete under stress ends and when creep begins. This interface may be adequately defined by assuming that the short-term stress - strain curve already presented, Eqn. 2.5, represents instantaneous behaviour and that increases in strain beyond this are due to creep and shrinkage. The division of time effects into the separate effects of creep and shrinkage is not truly correct since shrinkage does increase the magnitude of creep. However, since basically the same factors affect both phenomena, the implications involved in such a division are not of great importance(55).

Creep is affected mainly by the amount and type of aggregate, the water - cement ratio, the relative humidity and temperature of the surrounding air, the size and shape of the member, and the stress - strength ratio and history of sustained loads(3,55,56).

Like shrinkage, creep has little effect on the section capacity but increases deflections. Its effect on slender columns is very important, because of the increased bending moments due to increased deflections.

Creep is best studied as a function of short-term strain. It has been established that creep is a linear function of stress up to stress - strength ratios of about 25% to 30%(3). Because the short-term stress - strain relationship is almost linear in this range, creep can be regarded as a linear function of short-term strain for strains up to about 0.00035. Little information is available to describe the non-linearity beyond this range. It has been found, in the case of cylinders, that when the applied stress exceeds approximately 75% of the ultimate load, the usual creep behaviour is followed by an increase in the creep rate which leads to creep failure(3). Viest, Elstner, Hognestad(82) report that eccentrically loaded short columns fail under sustained loads of about 90% of the short-term capacity. It is generally felt that strain gradients have little effect on creep associated with small strains(3) but it seems possible that there may be some effect at high strains. In any case, the importance of creep failure on fibres is less significant in eccentrically loaded columns since high concrete strains only occur at loads near failure. Furthermore, prior to yielding of the steel, creep tends to transfer loads from the concrete to the steel. Both of these factors explain the higher levels of sustained load capacity indicated by the columns tested by Viest, Elstner, Hognestad. In studying the effect of creep on slender columns in this investigation, the sustained load was limited to 80% of the final ultimate capacity, as an upper limit for practical cases. It was felt that failure of fibres due to creep in this range could be ignored.

As with shrinkage, the prediction of creep based on concrete properties and environment yields very approximate estimates. The two most widely used prediction methods are those of ACI Committee 209(2) and of the CEB - FIP Recommendations(55). Both methods can yield quite different estimates and the lack of accuracy is recognized(2). Figure 2.11 shows a comparison of both methods with creep results reported by Drysdale(23). In the absence of better predicting methods, it seems wise to select the CEB - FIP method on the basis of conservatism alone.

Using the CEB - FIP method, creep is expressed as a multiple of the short-term strain

$$(\varepsilon_{cr})_t = (\phi_{cr})_t \, (\varepsilon_c)_t \quad \ldots. \; (2.8)$$

where $(\phi_{cr})_t$ is a function of time and other concrete properties such as water - cement ratio, cement content, relative humidity, member thickness, and age at loading. The ϕ_{cr}-time relationship is given in

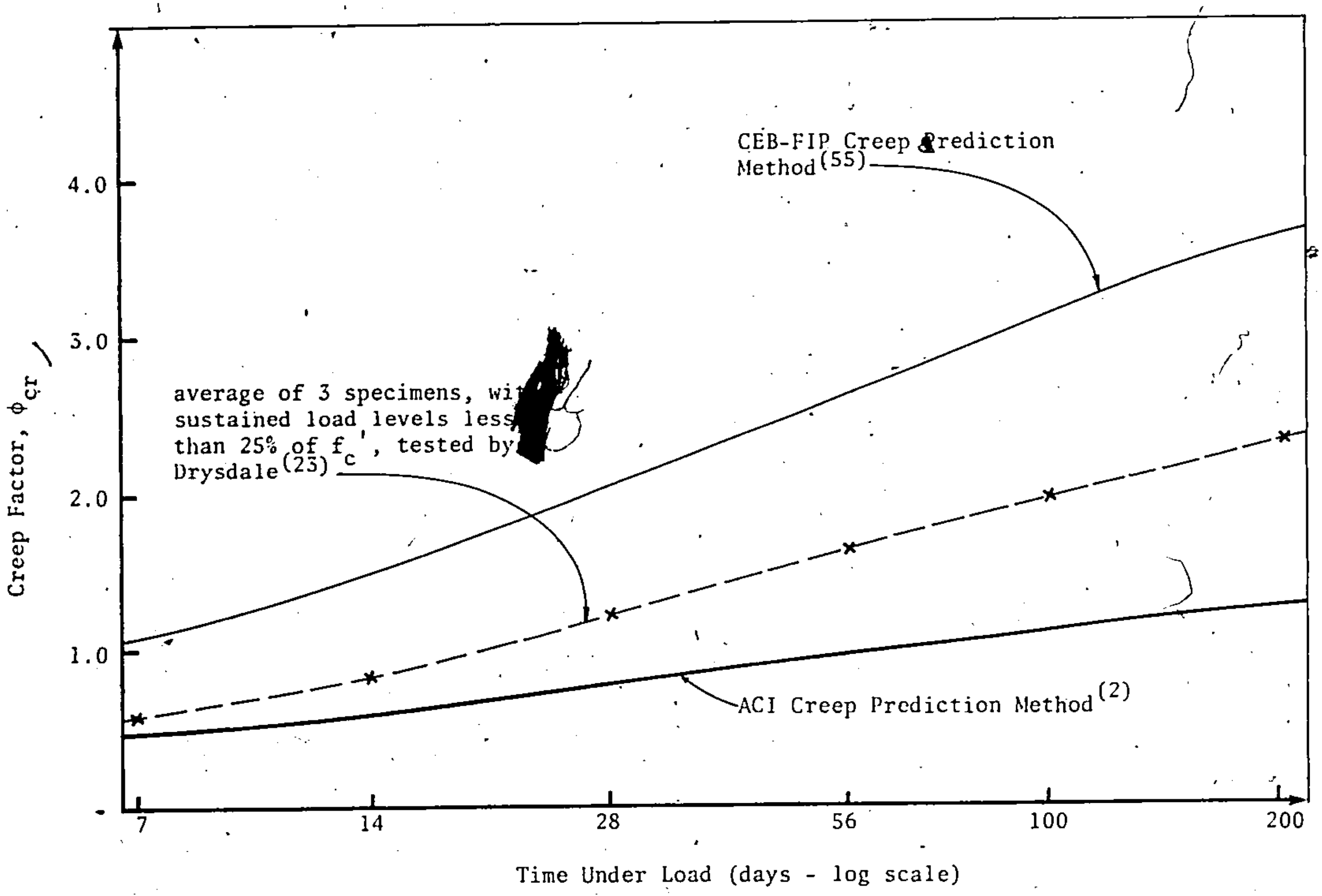

Fig. 2.11 COMPARISON OF CREEP PREDICTION METHODS WITH TESTS BY DRYSDALE

graphical form by the CEB - FIP Recommendations but this can be accurately represented by the curve

$$(\phi_{cr})_t = \phi_{cru} \quad \frac{t}{t^{0.68} + 13.5} \qquad \ldots . \; (2.9)$$

where t is the time under load in days.

A comparison of Eqn. 2.9 and the CEB - FIP curve is shown in Fig. 2.12.

As was the case for shrinkage prediction, creep values for the columns studied in this work were estimated by using the PCA method of proportioning concrete mixes$^{(65)}$ to estimate concrete mixes for concretes of 3 & 5 ksi. A relative humidity of 40% was assumed. This gave values for ϕ_{cru} of 4.185 for f_c' of 3 ksi, and 3.076 for f_c' of 5 ksi. The factor to account for age at loading suggested by the CEB - FIP method is reproduced in its graphical form in Fig. 2.13. This was represented by

$$\begin{aligned} \text{Age at loading factor} &= 1.9615 - 0.6644 \log_{10} (t_\ell) \\ &\quad \text{when } t_\ell \leq 28 \text{ days} \\ &= 1.7164 - 0.4950 \log_{10} (t_\ell) \\ &\quad \text{when } t_\ell \geqslant 28 \text{ days} \qquad \ldots . \; (2.10) \end{aligned}$$

It is thought, however, that this factor becomes unconservatively low at high loading ages and a limit of 0.6 was set for loading ages over 180 days.

It should be noted that this method predicts creep for low strains only. The value of ϕ_{cr} must be increased for short-term strains over 0.00035. Figure 2.14 shows creep results of Drysdale$^{(23)}$ and Freudenthal and Roll$^{(29)}$ plotted in terms of $\phi_{cr}/\phi_{cr(\varepsilon_c = 0.00035)}$ against short-term strain. In the absence of better information, the

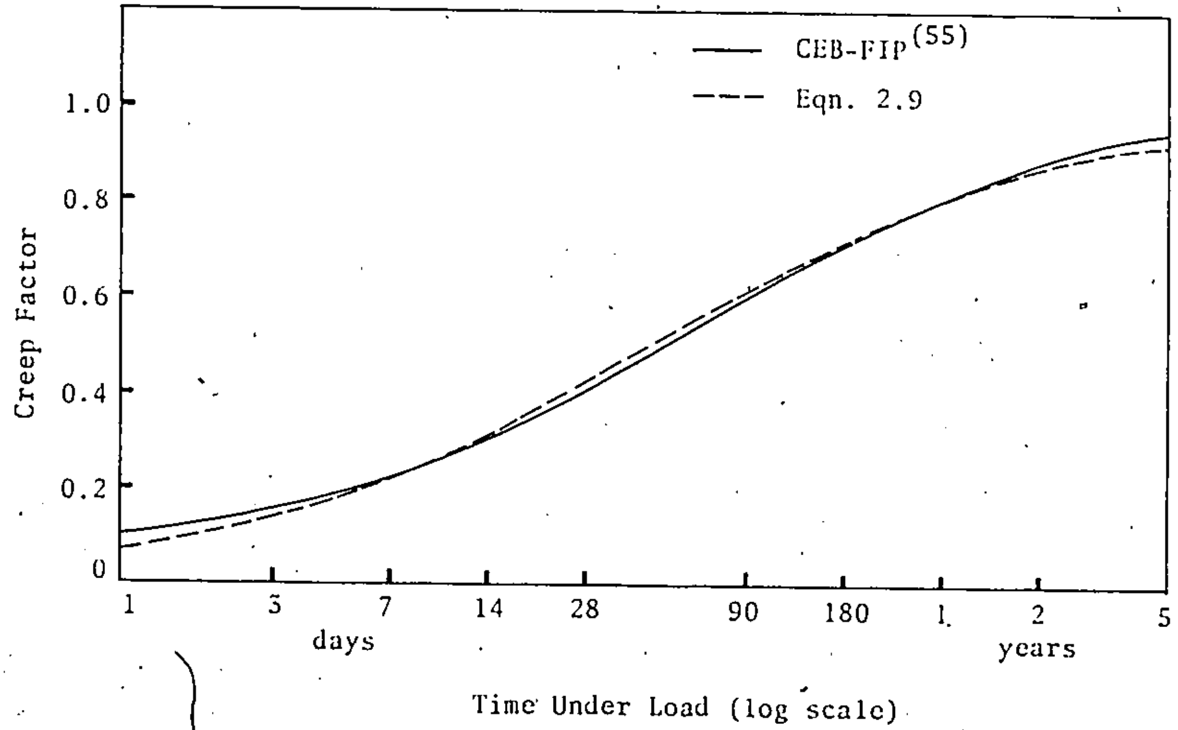

Fig. 2.12 THE CREEP - TIME UNDER LOAD RELATIONSHIP

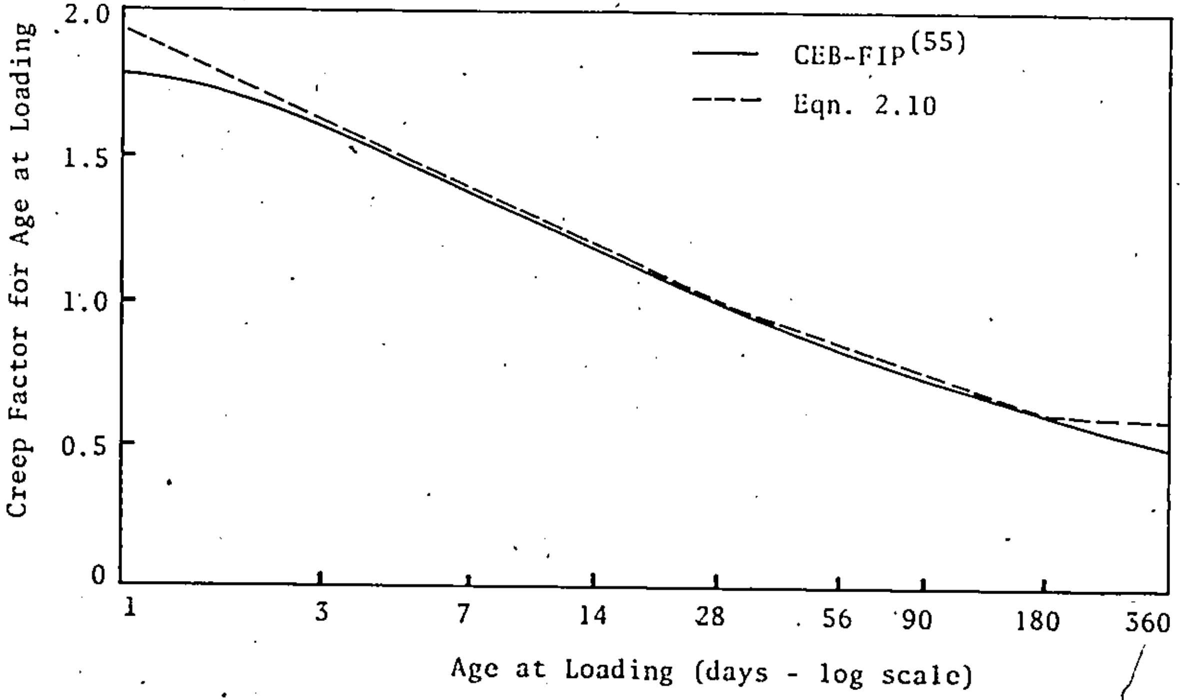

Fig. 2.13 THE EFFECT OF AGE AT LOADING ON CREEP

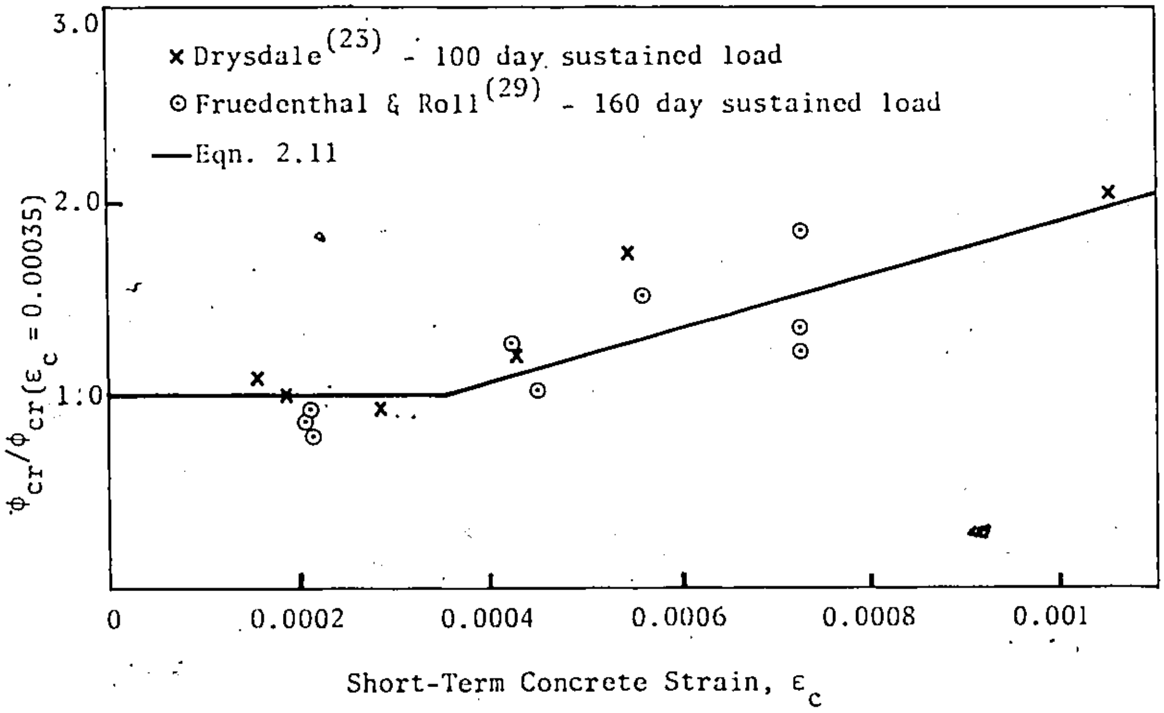

Fig. 2.14 THE NONLINEARITY OF THE CREEP FACTOR AT HIGH STRAINS

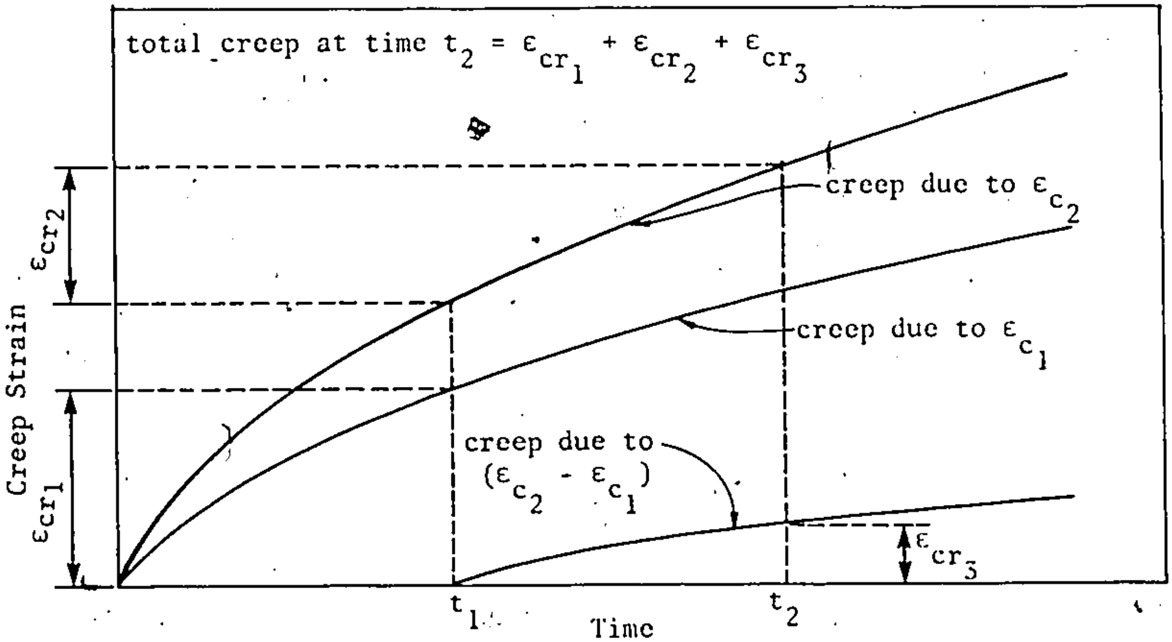

Fig. 2.15 DRYSDALE'S MODIFIED SUPERPOSITION METHOD FOR ESTIMATING CONCRETE CREEP (23)

following adjustment for nonlinearity based on Fig. 2.14 was used

$$\phi_{cr}/\phi_{cr(\varepsilon_c = 0.00035)} = 1 \text{ for } \varepsilon_c < 0.00035$$

$$= 0.5205 + 1370 \times \varepsilon_c$$

$$\text{for } \varepsilon_c > 0.00035 \quad \ldots\ldots (2.11)$$

In slender columns, creep causes an increase in bending moments by increasing deflection. Each fibre then is under a variable stress history rather than a constant one. Standard creep superposition methods fail to account for creep due to high strains. Drysdale(23) reviewed this matter and suggested a modified creep superposition method. This was used in this investigation and is reviewed briefly here.

Consider a concrete fibre loaded to short-term strain ε_{c_1} from time t_0 to t_1 and ε_{c_2} from time t_1 to t_2. By Drysdale's modified superposition method, the creep at t_2 is estimated by adding to the creep at t_1, the creep due to ε_{c_2} from t_1 to t_2 considered to be loaded at t_0 and the creep due to $(\varepsilon_{c_2} - \varepsilon_{c_1})$ from t_1 to t_2 considered to be loaded at t_1. This is illustrated in Fig. 2.15. For increasing strains, the method tends to overestimate creep when $\varepsilon_{c_2} >> \varepsilon_{c_1}$ and when $t_2/t_1 \geq t_1/t_0$. This is overcome by using a sufficient number of time intervals with $\frac{t_n - t_0}{t_{(n-1)} - t_0}$ approximately equal to 2.

For decreasing strains, the method involves estimation of creep recovery and becomes more complex. The modelling of the behaviour of concrete under decreasing loads would also require a concrete stress - strain relationship which accounts for unloading behaviour. In this investigation, creep recovery was ignored and the short-term behaviour of concrete under decreasing loads was assumed to follow the stress - strain curve presented for the loading case. The significance of both these assumptions is discussed in Chapter 3.

CHAPTER 3

ANALYTICAL MODEL

3.1 Introduction

As already mentioned, this thesis is concerned with the study of the effects of slenderness on the capacity of pinned end columns with no joint translation and subjected to end forces only. Nevertheless, the effect of slenderness on these columns depends on the many parameters of column geometry, material properties, and loading configuration and history. An analytical model must be used to give sufficient data to study the separate effects of these parameters. Experimental results are available to evaluate an analytical model but these are not sufficient to study the parameters of column properties and loading conditions.

This chapter discusses the format of the analytical model used in this study. Assumptions are defined and iterative methods are described. It outlines the techniques used in achieving a model efficient enough to examine the many combinations of the different variables.

3.2 Section Analysis

The analysis of any reinforced concrete member involves an analysis of at least one cross section. Finding the deflected shape of a reinforced concrete member under varying bending moment involves analyses at different sections along the member.

Section analysis can be divided into two types; the first being to find internal axial forces and moments if a strain distribution is known. The second type is the usual requirement and consists of finding the strain distribution across the section resulting from known loads. Because of the nonlinear behaviour of reinforced concrete the latter is not easily formulated into a direct solution and, therefore, an iterative method using the first approach must be used.

3.2.1 Analysis of a Section with a Known Strain Distribution: Because of the complex nature of concrete creep under variable stress, the modelling of a section does not lend itself easily to the derivation of a unique mathematical expression. An approximate numerical solution using discrete elements can be easily produced with the aid of a computer(23,72).

In this analysis the section is divided into twenty discreet strips perpendicular to the plane of bending. The strain distribution on each strip is approximated by an average uniform strain. As is discussed in Chapter 4, the use of twenty strips gives a high degree of accuracy.

The strain distribution on the section is defined by the curvature, Φ, and the strain at mid-depth, εm. The assumed uniform strain acting on the concrete of the n^{th} strip from the compression face of the section is given by

$$\varepsilon_n = \varepsilon m + \Phi d \left(\frac{10.5 - n}{20}\right) \qquad \ldots. \ (3.1)$$

where d is the depth of the section.

The concrete strain consists of shrinkage, creep, and effective or short-term strain. As discussed in Chapter 2, concrete stress is assumed to be a unique function of the effective concrete strain. The relationship is given by

$$f_c = k_3 f_c' \,(Ax^4 + Bx^3 + Cx^2 + Dx) \quad \ldots\ldots (3.2)$$

where f_c is the concrete stress

k_3 is a factor relating maximum strength of concrete in a member to that of a standard cylinder and is taken as 0.85 for vertically cast columns.

$x = \varepsilon_c/\varepsilon_{co}$

ε_c = effective concrete strain

$\varepsilon_{co} = 0.00225$

$A = -0.3775$

$B = 1.4548$

$C = -2.7769$

$D = 2.6997$

As mentioned in Section 2.4, the extreme descending region of the stress - strain relationship is modelled by a straight line from the curve at x equal to 1.5 to zero at x equal to 3.0.

The stress - strain relationship for reinforcing steel can be modelled accurately by the usual trapezoid with a yield plateau at the yield stress. The relationship is assumed to be identical for compression and tension. The stress - strain relationship for steel is therefore represented by

$$f_s = E_s \varepsilon_s \qquad \text{if } \varepsilon_s < \varepsilon_y$$

$$\text{and } f_s = f_y \qquad \text{if } \varepsilon_s > \varepsilon_y \qquad \ldots. \ (3.3)$$

where f_s is the steel stress.

E_s is the elastic modulus of the steel, taken as 29,000 ksi.

ε_s is the strain in the steel.

f_y is the yield stress of the steel.

The strain of the steel is given by

$$\varepsilon_s = \varepsilon m + \Phi(d/2 - d_s) \qquad \ldots. \ (3.4)$$

where d_s is the distance from the compression face of the section to the centroid of the steel.

For any given strain distribution, the steel strains and stresses are calculated by Eqns. 3.3 and 3.4. Effective concrete strains are calculated by subtracting the creep and shrinkage strains from the total concrete strains given by Eqn. 3.1, and concrete stresses follow by using Eqn. 3.2. The axial force, P, and the bending moment, M, are calculated by a simple summation of the forces and moments of the forces for each concrete strip and each steel layer.

3.2.2 Other Assumptions: Bernoulli's Hypothesis, or the assumption of a linear strain distribution, is used. The experimental results of Hognestad(40) show that this is a valid assumption.

It is assumed that slip between the concrete and steel does not occur. Local slipping does occur at tension cracks but this seems to have little effect on member behaviour(40). The use of deformed bars ensures that no general slip occurs.

It is assumed that the properties and spacing of ties follow the usual design recommendations and thus are sufficient to prohibit premature buckling of the reinforcing bars but not sufficient to develop appreciable triaxial stresses in the concrete by confinement (59, 61).

The effect of shear is assumed to be negligible. The axial load acting on columns leads to an increased shear capacity by reducing the diagonal tension and the column ties also act as shear reinforcement. Furthermore, shear acting on columns decreases as slenderness increases since end moments tend to decrease and the distance between shear forces at the column ends increases.

The tensile strength of concrete is ignored. Concrete is able to sustain some tension stresses before cracking and this does, to some extent, relieve steel stresses between cracks. The effect of the former is small since, at high bending moment levels, uncracked concrete under tension lies close to the neutral axis where it has minimal effect. The effect of relieving the steel stresses between cracks is to reduce deflections slightly and to ignore it is conservative. The tension strength of concrete reduces curvatures in cases where the load acts at an eccentricity of just over 1/6th of the depth. Ignoring tension is therefore conservative for columns with eccentricity ratios close to the suggested minimum of 0.1. This is reduced to some extent by the fact that, since the moment varies along the column height, the regions affected by tension strength are reduced. Furthermore, the tensile strength of concrete is not a reliable property and may some times be substantially reduced by shrinkage, construction joints, or brief periods of overloading.

The ultimate strength of beams is sometimes increased by strain-hardening of the steel, especially for cases with low percentages of reinforcement. Additional steel strength due to strain-hardening can only be realized at large deformations. Strain-hardening of the steel is therefore of no significance in slender columns since their capacities are reduced by deflections.

As mentioned, concrete stress is assumed to be a unique function of the effective concrete strain. This means that the unloading path is assumed to be the same as the loading path rather than the actual behaviour which would produce some residual strains. Therefore, an approximation exists in the modelling of concrete undergoing a decrease in strain. For columns in single curvature, any fibre undergoing a decrease in strain lies close to the neutral axis and therefore this has little effect. Where the unwinding effect near instability can decrease or reverse the bending moment acting on a section, some loss of accuracy is caused by this assumption. It should be noted, however, that sections which undergo this decreasing moment phenomenon are not subjected to high levels of moment and thus the discrepancy between the assumed unloading path and the actual behaviour is small. Normally these sections are close to the end of the column where they have less effect on the maximum column deflection. It should also be noted that creep recovery is not included in the model. For unloading cases, ignoring creep recovery underestimates the stress which is produced by a given strain, whereas the assuming that the short-term unloading path is the same as the loading path results in an overestimate of the stress.

3.2.3 Analysis of a Section Under Known Loads. The strain distribution over a section resulting from applied loads cannot be found directly due to the nonlinear stress - strain behaviour of the materials and the interactive effects of the axial force and bending moment. An iterative method must be used. The Newton Raphson method has proved to be a useful accelerator of iterative methods for section analysis$^{(39,72)}$ and has been successfully incorporated in this model.

As already shown in this section, every combination of εm and Φ gives a unique set of internal forces (P and M). By using Taylor's theorem with linear terms only

$$P_{(\varepsilon m_2,\Phi_2)} = P_{(\varepsilon m_1,\Phi_1)} + \left(\frac{\partial P}{\partial \varepsilon m}\right)_{(\varepsilon m_1,\Phi_1)} (\varepsilon m_2 - \varepsilon m_1) + \left(\frac{\partial P}{\partial \Phi}\right)_{(\varepsilon m_1,\Phi_1)} (\Phi_2 - \Phi_1) \quad \ldots (3.5)$$

$$M_{(\varepsilon m_2,\Phi_2)} = M_{(\varepsilon m_1,\Phi_1)} + \left(\frac{\partial M}{\partial \varepsilon m}\right)_{(\varepsilon m_1,\Phi_1)} (\varepsilon m_2 - \varepsilon m_1) + \left(\frac{\partial M}{\partial \Phi}\right)_{(\varepsilon m_1,\Phi_1)} (\Phi_2 - \Phi_1) \quad \ldots (3.6)$$

where $P_{(\varepsilon m_2,\Phi_2)}$ and $M_{(\varepsilon m_2,\Phi_2)}$ are the axial force and bending moment corresponding to a mid-depth strain of εm_2 and curvature of Φ_2.

$P_{(\varepsilon m_1,\Phi_1)}$ and $M_{(\varepsilon m_1,\Phi_1)}$ are the axial force and bending moment corresponding to εm_1 and Φ_1.

$\left(\frac{\partial P}{\partial \varepsilon m}\right)_{(\varepsilon m_1,\Phi_1)}$ and $\left(\frac{\partial M}{\partial \varepsilon m}\right)_{(\varepsilon m_1,\Phi_1)}$ are the rates of change of P and M with respect to εm at $(\varepsilon m_1,\Phi_1)$.

$(\frac{\partial P}{\partial \Phi})(\varepsilon m_1,\Phi_1)$ and $(\frac{\partial M}{\partial \Phi})(\varepsilon m_1,\Phi_1)$ are the rates of change of P and M with respect to Φ at $(\varepsilon m_1,\Phi_1)$.

Equations 3.5 and 3.6 can be rewritten in the form

$$\overline{P} \simeq P' + (\frac{\partial P}{\partial \varepsilon})' \, \overline{\Delta\varepsilon} + (\frac{\partial P}{\partial \varepsilon})' \, \overline{\Delta\Phi} \qquad \ldots\ldots (3.7)$$

$$\overline{M} \simeq M' + (\frac{\partial M}{\partial \varepsilon})' \, \overline{\Delta\varepsilon} + (\frac{\partial M}{\partial \varepsilon})' \, \overline{\Delta\Phi} \qquad \ldots\ldots (3.8)$$

where $(\overline{P},\overline{M})$ are the loads for which a strain distribution is required.

(P',M') are the loads corresponding to $(\varepsilon m',\Phi')$.

$(\frac{\partial P}{\partial \varepsilon m})'$, $(\frac{\partial P}{\partial \Phi})'$, $(\frac{\partial M}{\partial \varepsilon m})'$, and $(\frac{\partial M}{\partial \Phi})'$ are the rates of change of P and M with respect to εm and Φ at $(\varepsilon m', \Phi')$.

$\overline{\Delta\varepsilon m}$ and $\overline{\Delta\Phi}$ are the differences between $(\varepsilon m',\Phi')$ and the required $(\overline{\varepsilon m},\overline{\Phi})$ corresponding to $(\overline{P},\overline{M})$.

From Eqns. 3.7 and 3.8

$$\overline{\Delta\varepsilon m} \simeq \Delta'\varepsilon m = \frac{(\overline{P} - P')\,(\frac{\partial M}{\partial \Phi})' - (\overline{M} - M')\,(\frac{\partial P}{\partial \Phi})'}{(\frac{\partial P}{\partial \varepsilon m})'\,(\frac{\partial M}{\partial \Phi})' - (\frac{\partial M}{\partial \varepsilon m})'\,(\frac{\partial P}{\partial \Phi})'} \qquad \ldots\ldots (3.9)$$

$$\overline{\Delta\Phi} \simeq \Delta'\Phi = \frac{(\overline{P} - P')\,(\frac{\partial M}{\partial \varepsilon m})' - (\overline{M} - M')\,(\frac{\partial P}{\partial \varepsilon m})'}{(\frac{\partial P}{\partial \Phi})'\,(\frac{\partial M}{\partial \varepsilon m})' - (\frac{\partial M}{\partial \Phi})'\,(\frac{\partial P}{\partial \varepsilon m})'} \qquad \ldots\ldots (3.10)$$

Where $\overline{\Delta\varepsilon m}$ and $\overline{\Delta\Phi}$ are increments of εm and Φ which when added to $\varepsilon m'$ and Φ', would give the required $\overline{\varepsilon m}$ and $\overline{\Phi}$ corresponding to $\overline{P}$ and $\overline{M}$.

$\Delta'\varepsilon m$ and $\Delta'\Phi$ are approximations to $\overline{\Delta\varepsilon m}$ and $\overline{\Delta\Phi}$.

The Newton-Raphson method involves the following procedure.

1. For a trial set of $(\varepsilon m', \Phi')$ find (P', M').
2. Find approximations to $(\frac{\partial P}{\partial \varepsilon m})'$, $(\frac{\partial P}{\partial \Phi})'$, $(\frac{\partial M}{\partial \varepsilon m})'$, and $(\frac{\partial M}{\partial \Phi})'$ by finding the change in P, δP, and the change in M, δM, at $(\varepsilon m', \Phi')$ due to changes in εm, δ[illegible], and Φ, $\delta\Phi$ and by using the approximations

$$(\frac{\partial P}{\partial \varepsilon m})' \simeq (\frac{\delta P}{\delta \varepsilon m})'$$

$$(\frac{\partial P}{\partial \Phi})' \simeq (\frac{\delta P}{\delta \Phi})'$$

$$(\frac{\partial M}{\partial \varepsilon m})' \simeq (\frac{\delta M}{\delta \varepsilon m})'$$

$$(\frac{\partial M}{\partial \Phi})' \simeq (\frac{\delta M}{\delta \Phi})'$$

3. Find $\Delta'\varepsilon m$ and $\Delta'\Phi$ from Eqns. 3.9 and 3.10.
4. Find a new set of $(\varepsilon m', \Phi') = (\varepsilon m' + \Delta'\varepsilon_m, \Phi' + \Delta'\Phi)$.
5. Repeat steps 1 to 4 until $\overline{P} \simeq P'$ and $\overline{M} \simeq M'$.

As with any application of the Newton-Raphson method, the choice of the initial trial value is important in determining the efficiency of the method and often the correctness of the solution. This is discussed further in a later section of this chapter.

When the applied loads exceed the section capacity, failure is indicated by the fact that the Newton-Raphson method cannot obtain a strain distribution which satisfies equilibrium.

3.3 Column Analysis

In slender columns, the bending moments vary throughout the column height and depend on the deflection profile of the column. Therefore, the analysis must involve an analysis of different sections throughout the column. An approximate numerical solution can be obtained by dividing the column into elements of equal length(23,72). Each element is bounded by two sections for which strain distributions are found and the average of these strain distributions is assumed to be the strain distribution of the element. The column deflected profile is estimated by applying numerical integration to the strain distributions of each element, ensuring that no end translation occurs.

The analysis of a column under known end loads must employ an iterative process because deflections and bending moments are interrelated. The analytical model uses the following method.

1. Bending moments at each section are calculated from the end forces by statics. Axial force at each section is equal to the end axial force. (Selfweight of the column is ignored.)
2. The strain distributions at each section for the applied bending moments and axial force are calculated using the section analysis technique outlined in the previous section.
3. The column deflection at each section is calculated by assuming that the deformation of each element is given by the average of the strain distributions at each end.
4. New bending moments are calculated for each section by adding the initial bending moments to the bending moments caused by the axial force acting at eccentricity equal to the deflection.
5. Steps 1 to 4 are repeated until the bending moments of successive iterations are within a specified small percentage of each other.

The capacity of a column is found by increasing the end loads until a stable strain distribution cannot be found for the section under the maximum bending moment.

3.4 Modelling of Time Effects

Because creep increases column deflection, the beneficial effect of concrete strength gain with age on slender columns is usually outweighed by the effect of sustained loads. The capacity of slender columns depends on the level of sustained loads and the durations for which they apply. In practice, the sustained load acting on a column may change appreciably with time. It is thought, however, that column behaviour can be simulated by applying a constant sustained load for a prolonged period and then subjecting the column to a further short-term load to failure. The sustained load period is taken as twenty-five years because time effects are not significant beyond this point.

Time effects on concrete are incorporated by analysing the structural behaviour over 12 time intervals, as given in Table 3.1. The first time interval represents the period between the end of moist curing and the initial loading time. The remaining 11 time intervals represent periods of sustained load where stresses are assumed to be constant and equal to those estimated at the beginning of each period. At the end of each interval, creep and shrinkage strains are computed, a new deflection profile is calculated, and the corresponding new bending moments are applied to the column which result in new stresses.

TABLE 3.1 TIME INTERVALS USED IN SIMULATING PERIODS OF SUSTAINED LOAD

Time Interval Number	Age at Start of Time Interval (Days)	Age at End of Time Interval (Days)	Comments
1	7	28	first period for shrinkage only
2	28	31.5	sustained load applied at 28 days
3	31.5	35	
4	35	42	
5	42	56	
6	56	94	
7	94	183	
8	183	393	
9	393	758	
10	758	1853	
11	1853	3678	column loaded to failure at 9153 days
12	3678	9153	

The final capacity of the column is predicted at the end of the twelfth period by applying increased short-term loads to failure. Because the rate of creep decreases with time, the time intervals were chosen so that each interval is approximately twice as long as the previous one.

The n^{th} time period is defined as starting at time $t_{(n-1)}$ and ending at time t_n. At the end of the n^{th} time period, concrete strength, f'_{c_n}, concrete shrinkage strains, ε_{sh_n}, and concrete creep strains, ε_{cr_n}, are determined. New bending moments and strain distributions are then calculated and assumed to be constant over the (n+1) time interval. The effective concrete strain acting during the (n+1) time interval is given by $\varepsilon_{c_{(n+1)}}$.

Concrete strength at time t_n is estimated, as in Eqn. 2.3, by

$$f'_{c_n} = \frac{t_n}{28 + B(t_n - 28)} \times f'_{c_{28}} \qquad \text{.... (3.11)}$$

where B = 0.9091 unless otherwise indicated.

Shrinkage strain at time t_n is estimated, as in Eqn. 2.7, by

$$\varepsilon_{sh_n} = \frac{t_n - t_0}{35 + (t_n - t_0)} \times \varepsilon_{shu} \qquad \text{.... (3.12)}$$

where $\varepsilon_{shu} = 515 \times 10^{-6}$ unless otherwise indicated.

As discussed in Chapter 2, creep at any time is estimated by using a slightly modified CEB - FIP prediction method(55), a factor to account for creep at high strains, and Drysdale's(23) modified superposition method. The total creep estimated at the end of any period is the sum of the creep estimated at the end of the previous period, the creep occurring in the period due to the effective concrete strain acting during the period but assumed to have been present since the time of initial loading, t_1, and the creep occurring in the period due to an effective concrete strain, equal to the difference between effective concrete strain for this period and the previous period, assumed to have been acting since the start of this period.

In mathematical terms, the creep estimated at the end of the n^{th} time interval is given by

$$\begin{aligned} \varepsilon_{cr_n} = \varepsilon_{cr_{(n-1)}} &+ \phi_{cru} \times \varepsilon_{c_n} \times \left\{ \frac{(t_n-t_1)^{0.68}}{(t_n-t_1)^{0.68}+13.5} - \frac{(t_{(n-1)}-t_1)^{0.68}}{(t_{(n-1)}-t_1)^{0.68}+13.5} \right\} \\ &\times CTLF_{t_1} \times CNLF_{\varepsilon_{c_n}} \\ &+ \phi_{cru} \times (\varepsilon_{c_n} - \varepsilon_{c_{(n-1)}}) \\ &\times \left\{ \frac{[t_n - t_{(n-1)}]^{0.68}}{[t_n - t_{(n-1)}]^{0.68}+13.5} \right\} \\ &\times CTLF_{t_{(n-1)}} \times CNLF_{[\varepsilon_{c_n} - \varepsilon_{c_{(n-1)}}]} \quad \ldots (3.13) \end{aligned}$$

where $\varepsilon_{cr_{(n-1)}}$ is the creep estimated at the end of the $(n-1)^{th}$ time interval.

ε_{c_n} is the effective concrete strain acting over the n^{th} time interval.

$\varepsilon_{c_{(n-1)}}$ is the effective concrete strain acting over the $(n-1)^{th}$ time interval.

$CTLF_{t_1}$ is the creep time of loading factor for time of initial loading, t_1.

$CTLF_{t_{(n-1)}}$ is the creep time of loading factor for time $t_{(n-1)}$.

$CNLF_{\varepsilon_{c_n}}$ is the creep nonlinearity factor for effective concrete strain ε_{c_n}.

$CNLF_{(\varepsilon_{c_n} - \varepsilon_{c_{(n-1)}})}$ is the creep nonlinearity factor for an effective concrete strain equal to $\varepsilon_{c_n} - \varepsilon_{c_{(n-1)}}$.

3.5 Convergence Considerations

The use of the Newton-Raphson method in obtaining an equilibrium strain distribution for a given set of loads has already been discussed by Gurfinkel & Robinson(39). However, mention should be made of the aspects involved in its incorporation into the analytical method for predicting slender column capacity.

Figure 3.1 shows a typical relationship between loads and the section deformation parameters, strain at mid-depth, εm, and curvature, Φ. It is evident that two sets of the deformation parameters correspond to a given axial load, P, and bending moment, M. The second set with higher deformation values corresponds to a point on the descending region of the

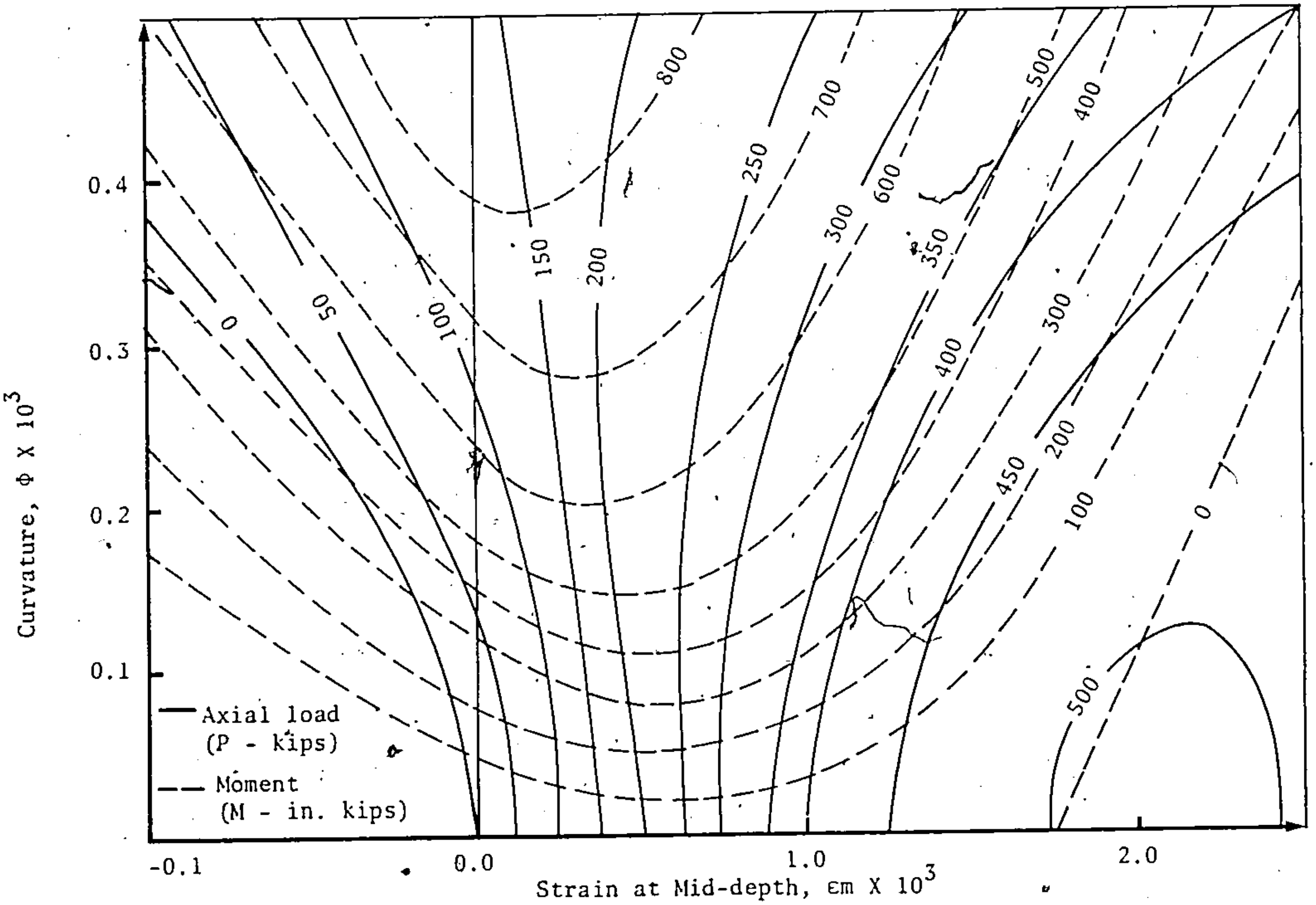

Fig. 3.1 A TYPICAL LOAD - STRAIN DISTRIBUTION RELATIONSHIP

load - deformation relationship. Care must be taken to ensure that the Newton-Raphson method gives the correct set of equilibrium deformation values which, in predicting column capacity, is always the lower of the two possibilities.

A study of this topic indicated that the Newton-Raphson method always gave the correct solution provided that the initial trial deformations were on the ascending region of the load - deformation relationship. This is regarded as being analogous to a one dimensional load - strain function with a negative second derivative. In this case it can be proven that the Newton-Raphson method always gives the correct solution for a value on the ascending region provided the initial trial value of strain also lies on the ascending region.

An equilibrium strain distribution is considered to occur when the estimated loads are within 1% of the actual applied loads. For slender columns under double curvature, the bending moment applied to a cross section could be close to zero. For these cases, convergence to an equilibrium strain distribution is deemed to occur when the estimated moment is less than 0.1 in. kips.

With these convergence criterian, equilibrium strain distributions are achieved in less than ten iterations. Section failure is indicated when the denominator of Eqns. 3.9 and 3.10 becomes zero or when a specified maximum number of iterations is exceeded. This limit of iterations was set at twenty. Increasing this to a hundred for some test runs showed no increase in predicted capacity.

With the addition of the creep and shrinkage strains, care must be taken to ensure that the initial trial deformation set results in positive effective strains. This is achieved by setting the initial trial strain at mid-depth, $\varepsilon m'$, equal to the sum of the creep and shrinkage strains at this fibre, and by choosing the initial trial curvature, Φ', such that the strain on the strip at the compression face of the section is equal to the sum of the creep and shrinkage strains at that strip.

The efficiency of the Newton-Raphson method depends on how close the trial strain distribution is to the required one. As mentioned in Section 3.3, finding the deflected profile for a slender column is also an iterative process in which the bending moments on each section are increased as deflection increases until convergence is met. During each iteration a strain distribution corresponding to a lower bending moment is available. These strain distributions are used as the trials for the next iteration as a means of improving the efficiency of the analytical model. Since column capacity is found by increasing the column end loads until failure occurs, the efficiency is also improved by using the strain distributions at the end of a loading stage as the trial values for the next.

The same concept can be applied to utilize the strain distributions at the end of each time interval. This is accomplished by setting the trial mid-depth strain, $\varepsilon m'$, equal to the sum of the effective concrete strain of the previous interval and the creep and shrinkage strains estimated at the end of the previous interval. The trial curvature is taken as the greater of the curvature of the previous interval and a value which gives a strain at the compression fibre equal to the creep and shrinkage strains estimated at the end of the previous interval.

The predicted capacity of a column is found by increasing the end loads until equilibrium cannot be satisfied. Each loading stage involves an iteration to an equilibrium deflection profile. This is accelerated by using the deflection profile resulting from one level of loads as an initial profile in beginning the analysis under the next load level. The deflected profile at the end of one time interval is also used as an initial profile for the next interval.

3.6 Computer Programme

The prediction of slender column capacity by the analytical method involves the use of a computer programme. This programme was written in the Fortran Extended Version 4 language for use on the CDC 6400 computer at the McMaster University Computer Centre.

Features of the computer programme by Sallam(72) were adapted for use in this programme. It is divided into numerous subroutines in order to facilitate its use by others. A flowchart of the basic steps of the programme is shown in Fig. 3.2. The complete programme listing included in Appendix B describes details of the programme with the aid of comment statements.

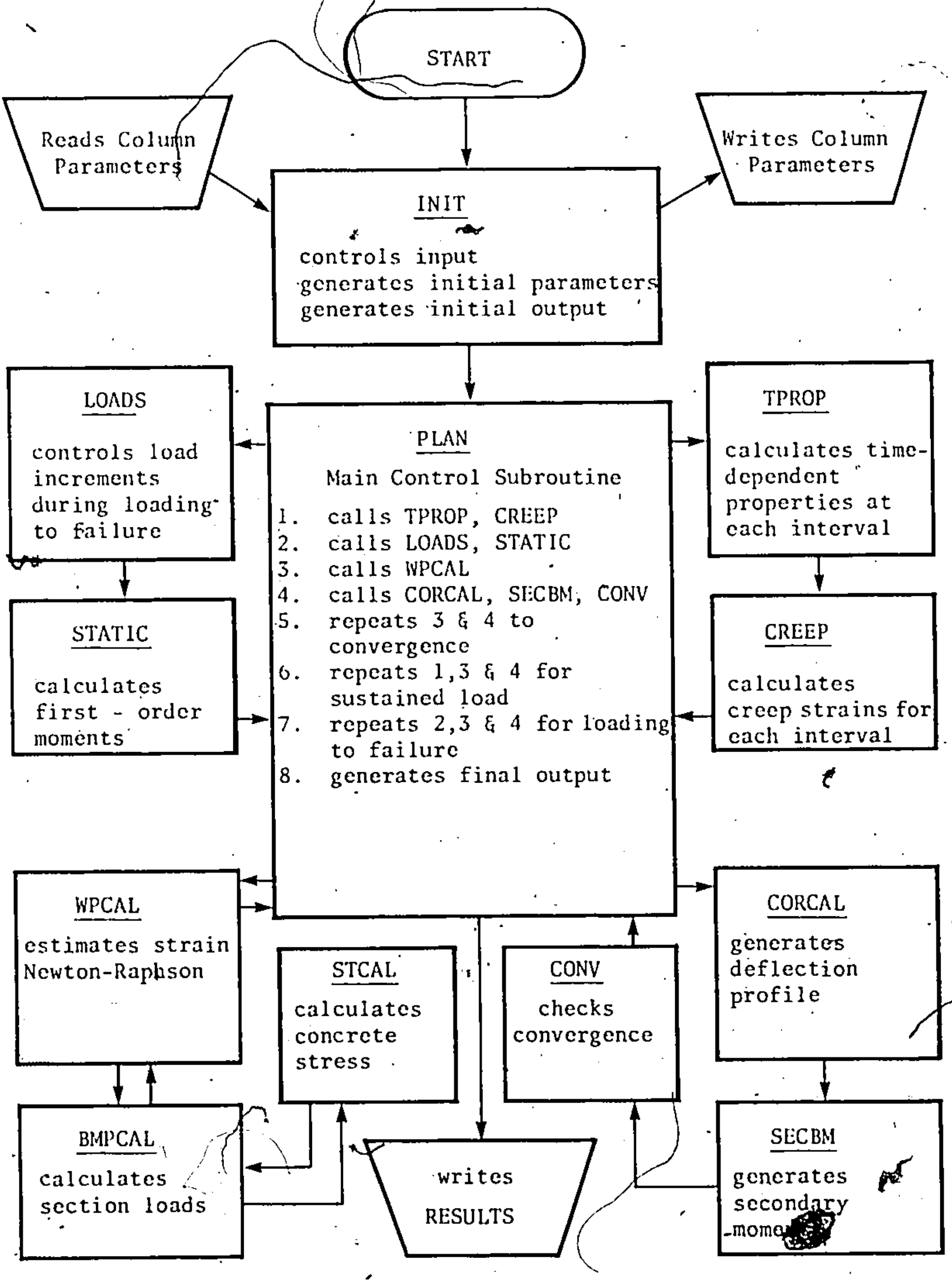

Fig. 3.2 FLOW CHART OF THE ANALYTICAL METHOD PROGRAMME

CHAPTER 4

EVALUATION OF THE ANALYTICAL MODEL

4.1 Introduction

Any model that is used to assess present design methods, and as the basis for recommending a better method, must be thoroughly evaluated. The degree of error inherent in the numerical procedure and the sensitivity of the results to the assumptions should be studied. Finally, the ultimate evaluation of any model must be made by comparison with available laboratory tests.

This chapter follows the above outline. Approximations incorporated into the numerical procedure, such as, the number of strips per cross section, the number of elements per column length, the convergence limits, and the number of time intervals used for long-term loading are studied and the degree of precision of the model is assessed. Another section of this chapter is devoted to the study of the sensitivity of the analytical result to the various assumptions of material properties, such as, the shape and parameters of the concrete stress - strain curve, shrinkage, and creep, which were incorporated into the analytical model. The final section of this chapter contains a comparison of the model with available test results.

4.2 The Precision of the Numerical Procedure

Some degree of error occurs by averaging continuous functions over a finite number of discreet elements and time intervals. Furthermore, with iteration techniques, some loss in accuracy occurs in defining an acceptable solution. These sources of error must be studied.

The use of discrete elements in the model consists of taking specific numbers of strips per cross section, elements per column height, and time intervals to simulate the behaviour of columns under sustained loads. Iterative techniques are used in finding the strain distribution over a section, the column deflection profile, and the column capacity.

The precision can be increased in any of these by increasing the number of discrete elements and the convergence accuracy limits, all of which greatly increase computing time. In view of the large volume of analytical results needed to study slender column behaviour over its many variables, an effort was made to select appropriate values for these which would give minimum computation time and simultaneously yield an acceptable degree of precision. As a result, 20 strips per cross section, 10 elements per column height, and 12 time intervals were used. The acceptable accuracy for iteration convergence was set at 1%.

The accuracy of the section analysis depends on the number of strips that the section is divided into. The computing time can be regarded as being nearly proportional to this number. The accuracy associated with the number of strips is defined as the accuracy in predicting a strain distribution under a given set of loads. This can be reasonably and simply measured by investigating the accuracy in predicting a set of loads for a given strain distribution. The accuracy is poorest for sections when concrete properties are of greatest importance, when the area of concrete under compression is small, and when high nonlinearity in the concrete stress - strain curve occurs.

Figure 4.1 illustrates the accuracy in predicting loads under these conditions. The section used had a concrete strength, f_c', of 5 ksi, a steel yield strength, f_y, of 40 ksi, a percentage steel ratio, ρ, of 1%, and a distance between the two layers of steel of 0.65 times the section depth. The neutral axis was taken as 0.4 of the section depth from the compression face to represent a typical lower limit on the area of concrete under compression. The plotted values represent the ratio of loads predicted by using strips to those predicted by using a continuous function and are averages for four strain distributions giving a range of extreme fibre compression strain from 0.0027 in./in. to 0.003375 in./in.

It is seen that the error incurred by using 20 strips is in the range of 0.4%. It appears from Fig. 4.1 that loads are over-estimated by approximating with strips, but this is true only for high strain levels and the opposite occurs for lower levels. This value for inaccuracy represents an approximate upper limit and accuracy is greater for sections where steel is more important, when a greater area of

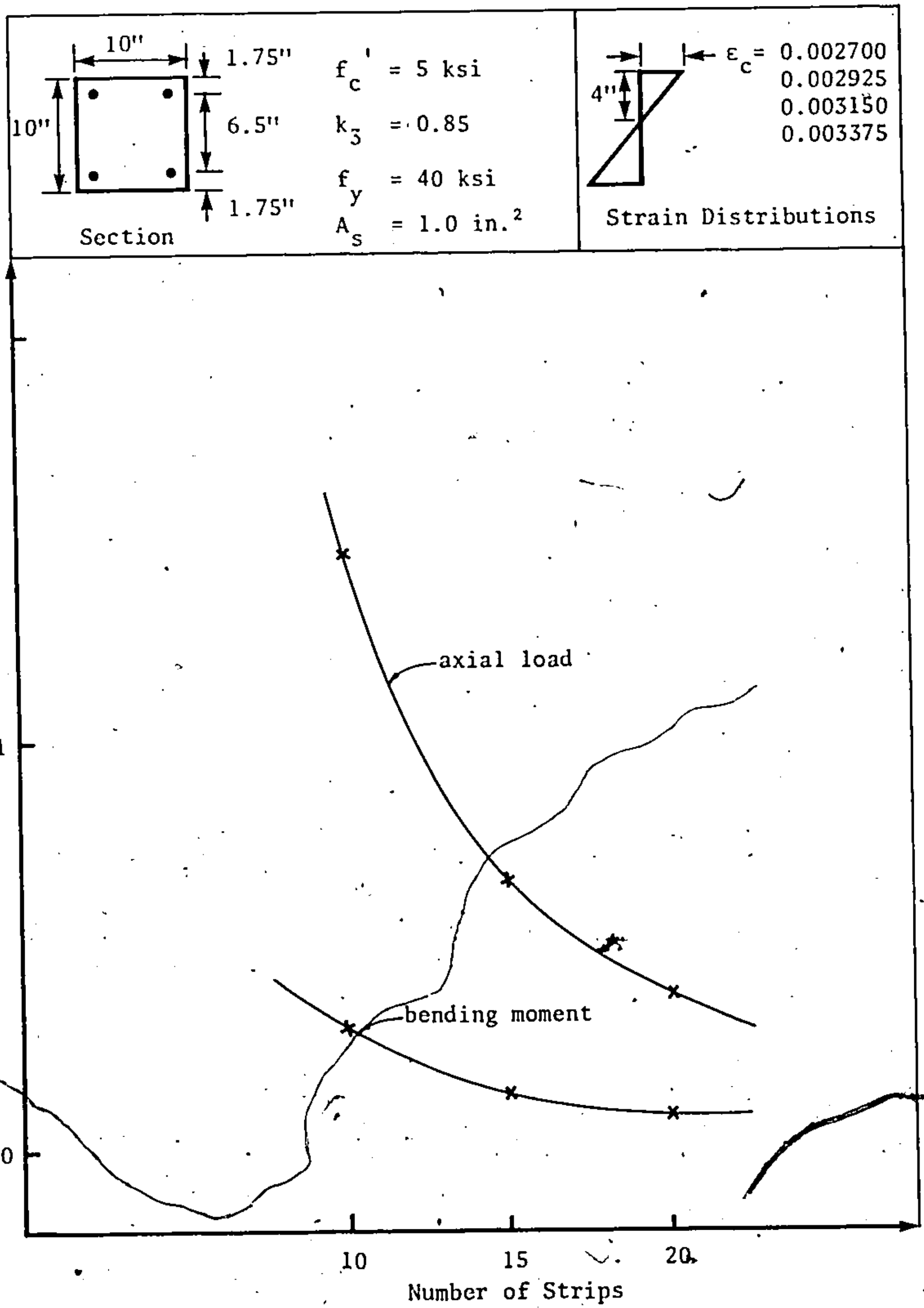

Fig. 4.1 ACCURACY VERSUS NUMBER OF CROSS SECTION STRIPS

concrete is in compression, and when strains are more linear. Creep tends to increase the linearity of the effective strain over the section and increases the accuracy of the strip approximation.

The number of elements per column height is important in predicting column deflection which has a considerable effect on slender column capacity. Again, computing costs are approximately proportional to this number. The error associated with the number of elements is greatest when the column is subjected to double curvature and where the curvature profile over the column height is highly nonlinear.

Figure 4.2 shows the error in predicting maximum column deflection for two hypothetical cases. The error is measured by comparing the deflection predicted by dividing the line into discreet elements and assuming average curvature over each with the correct deflection obtained by using the continuous function. The nonlinearity of the curvature profile is typical of that caused by the nonlinear bending moment profile due to slenderness and the nonlinearity of the bending moment versus curvature relationship. It is seen that the error incurred in predicting maximum deflection by using 10 elements can be in the region of 3%. The accuracy is better for cases of single curvature due to the less severe nonlinearity of curvature over the height of the column. The error is partly due to the fact that the joints between elements do not coincide with the position where the exact maximum deflection occurs. A study of the cases used in Fig. 4.2 indicated that this accounted for almost a half of the error when 10 elements were used.

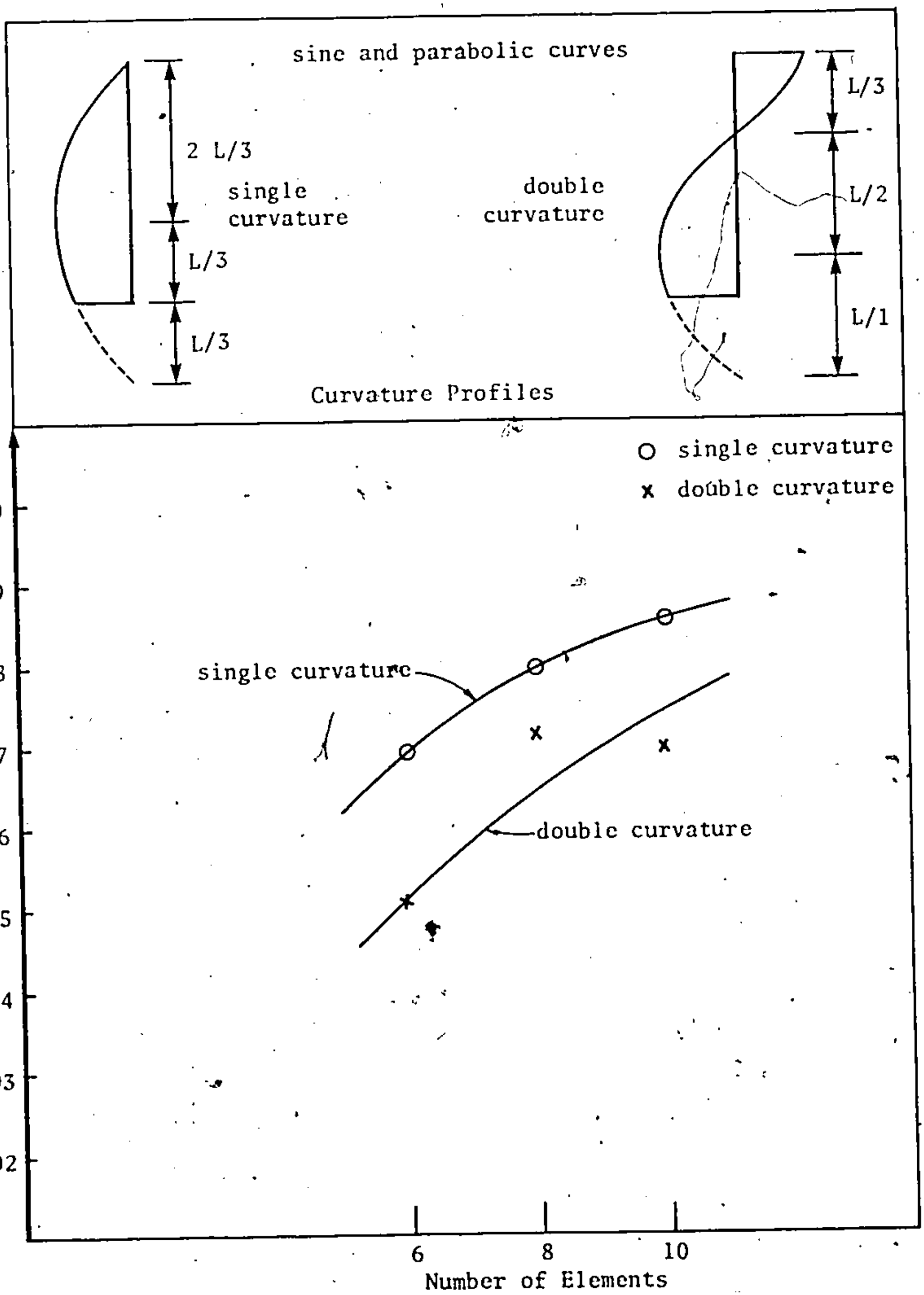

Fig. 4.2 ACCURACY VERSUS NUMBER OF ELEMENTS OVER THE COLUMN HEIGHT

As mentioned in the previous chapter, convergence to a strain distribution for a given set of loads is deemed to occur when a strain distribution is found which gives a maximum discrepancy of 1% between the estimated loads and the given loads. Convergence to the deflected profile of a column under given loads is deemed to occur when the differences between the bending moments of successive iterations are within 1% of the most recent bending moments.

It may be realized that, for high levels of load, the load-deformation relationships are nonlinear and therefore the convergence limit of 1% on loads will result in a greater error in deformations. Although this might underestimate the maximum bending moment in the column, at any axial load, the overall error is not significantly increased since a further 1% increase in axial load, at these high load levels, would greatly increase deflections. A similar argument can be made for the error introduced by using a number of elements, since a 1% increase in axial load, near the column capacity, causes a change greater than the error associated with the use of the limited number of elements. It can, therefore, be stated that the precision of the method in predicting column capacity is in the order of 1%. However, it must be pointed out that errors in predicting deflection, especially at high load levels, can be much greater than this.

In finding the capacity of a column, the axial load at a specific eccentricity is increased in large increments until a load is reached for which equilibrium can not be found. The load is then reduced to the previous level and increased in smaller increments. This process is repeated until increments are approximately 1% of the capacity. The highest load for these increments, which satisfies equilibrium, is the predicted capacity of the column.

To study the sensitivity of the analytical method to the number of time intervals used, the capacity of a column with a cross section with low values for the steel parameters was predicted for a sustained load using three different numbers of time intervals. The column had a concrete strength, f_c', of 3 ksi, a steel yield strength, f_y, of 60 ksi, a percentage steel ratio, ρ, of 1% and a 10 in. X 10 in. cross section with 6.5 in. between the two equal layers of steel. A load of 40 kips was sustained over a simulated twenty-five year period. The column had a slenderness ratio, L/h, of 30 and an eccentricity ratio, e/h, of 0.1. The load was applied symmetrically to both ends. After the sustained loading period, short-term loading to failure was included.

Figure 4.3, showing the predicted deflection - time profiles for this column, indicates that the behaviour was not sensitive to the number of time intervals. The final capacities of the column were predicted as 72.0 kips, 72.6 kips, and 72.6 kips for seven, twelve, and twenty time intervals, respectively.

4.3 Sensitivity of the Analytical Result to the Assumptions Concerning Material Properties

As pointed out in Section 2.4, the k_3 parameter of the concrete stress - strain curve was chosen as 0.85 to account for compaction and water gain effects. A value of 0.00225 was chosen for ε_{co} to represent

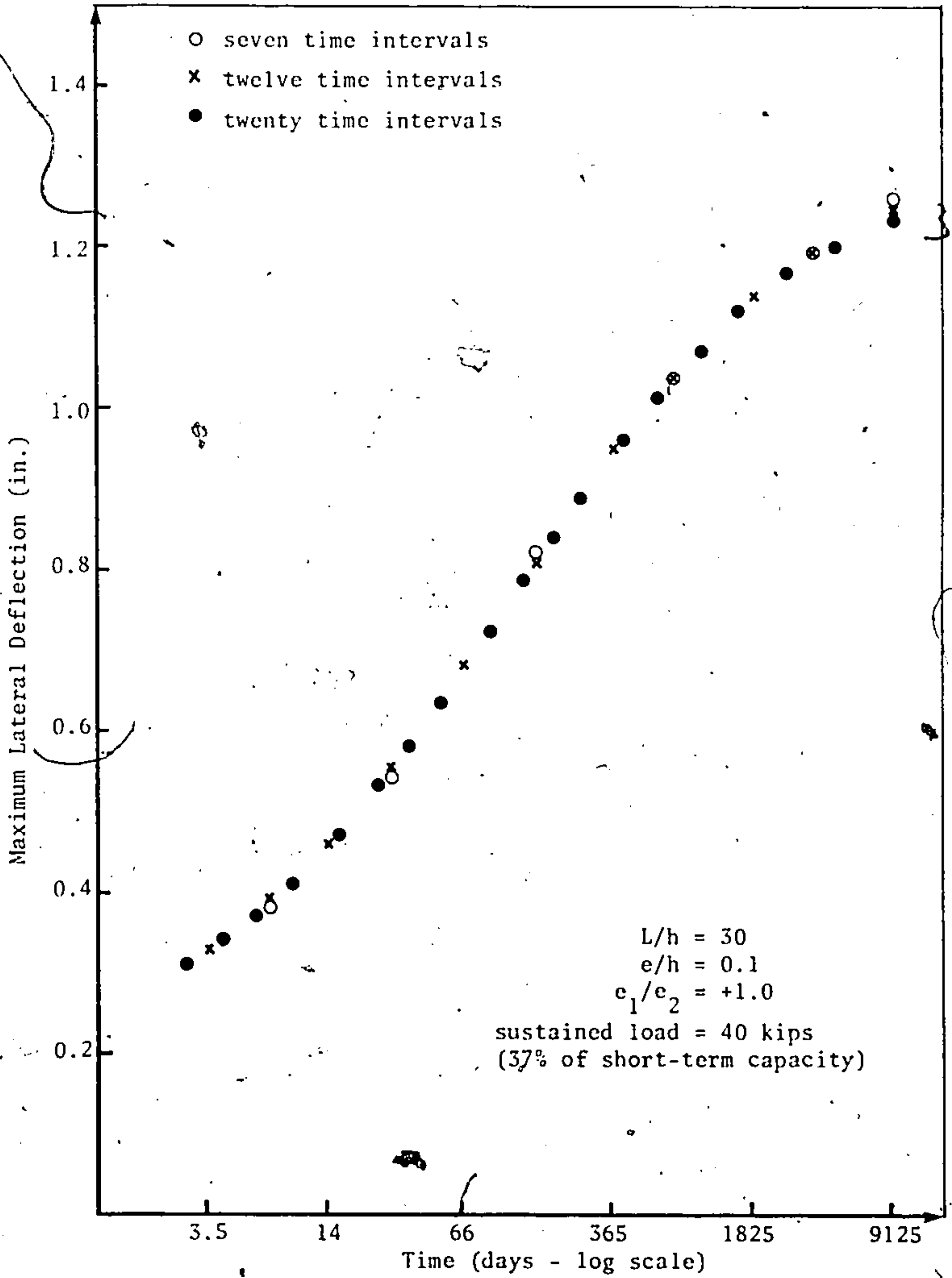

Fig. 4.3 SENSITIVITY OF THE ANALYTICAL METHOD TO THE NUMBER OF TIME INTERVALS

loading durations of about one hour.

Figure 4.4 shows the effect of changing these parameters on the predicted short-term capacity of the column used in the previous section. Since the capacity was controlled by both the concrete strength and the section stiffness, the effects are larger than in other cases. It is believed that the use of $k_3 = 0.85$ and $\varepsilon_{co} = 0.00225$, on the basis of the discussion of Chapter 2, is justifiable.

The shape of the concrete stress - strain curve used was discussed in Chapter 2. Figure 4.5 shows the predicted behaviour of the same column using this and two other concrete stress - strain curves. These two curves were developed from the general stress - strain curve of Chapter 2 but using different values of f_c/f_{co} at the $\varepsilon_c/\varepsilon_{co}$ values of 0.5 and 1.5. Curve "B" is based on f_c/f_{co} equal to 0.75 at $\varepsilon_c/\varepsilon_{co}$ of 0.5 and on f_c/f_{co} equal to 0.8 at $\varepsilon_c/\varepsilon_{co}$ of 1.5, and differs from the curve used throughout this thesis, Curve "A", in having a shallower ascending path. Curve "C" was developed from f_c/f_{co} equal to 0.85 at $\varepsilon_c/\varepsilon_{co}$ of 1.5 and differs from Curve "A" in having a gentler descending path. The differences between the predicted behaviour using Curve "A" and Curve "C" were negligible which confirms the earlier assumption that concrete behaviour in the descending branch has little effect on capacity. The lower strength predicted using Curve "B" is due to the decreased stiffness of the concrete modelled with this curve.

Since shrinkage has been ignored in the development of other analytical methods$^{(50)}$, it is of interest to study its effect. For this the column was subjected to a sustained load with no shrinkage and then

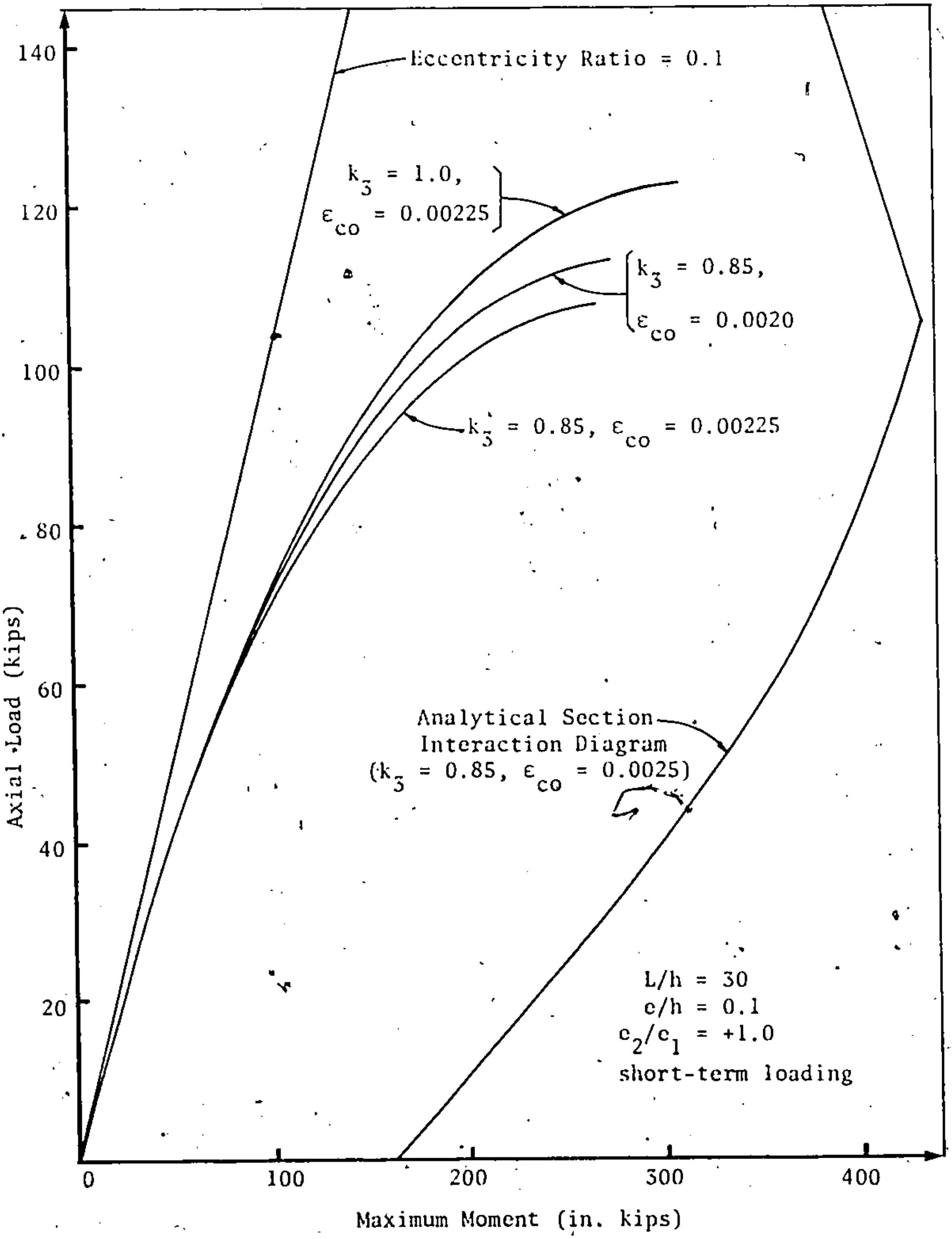

Fig. 4.4 EFFECT OF THE PARAMETERS OF THE CONCRETE STRESS - STRAIN RELATIONSHIP

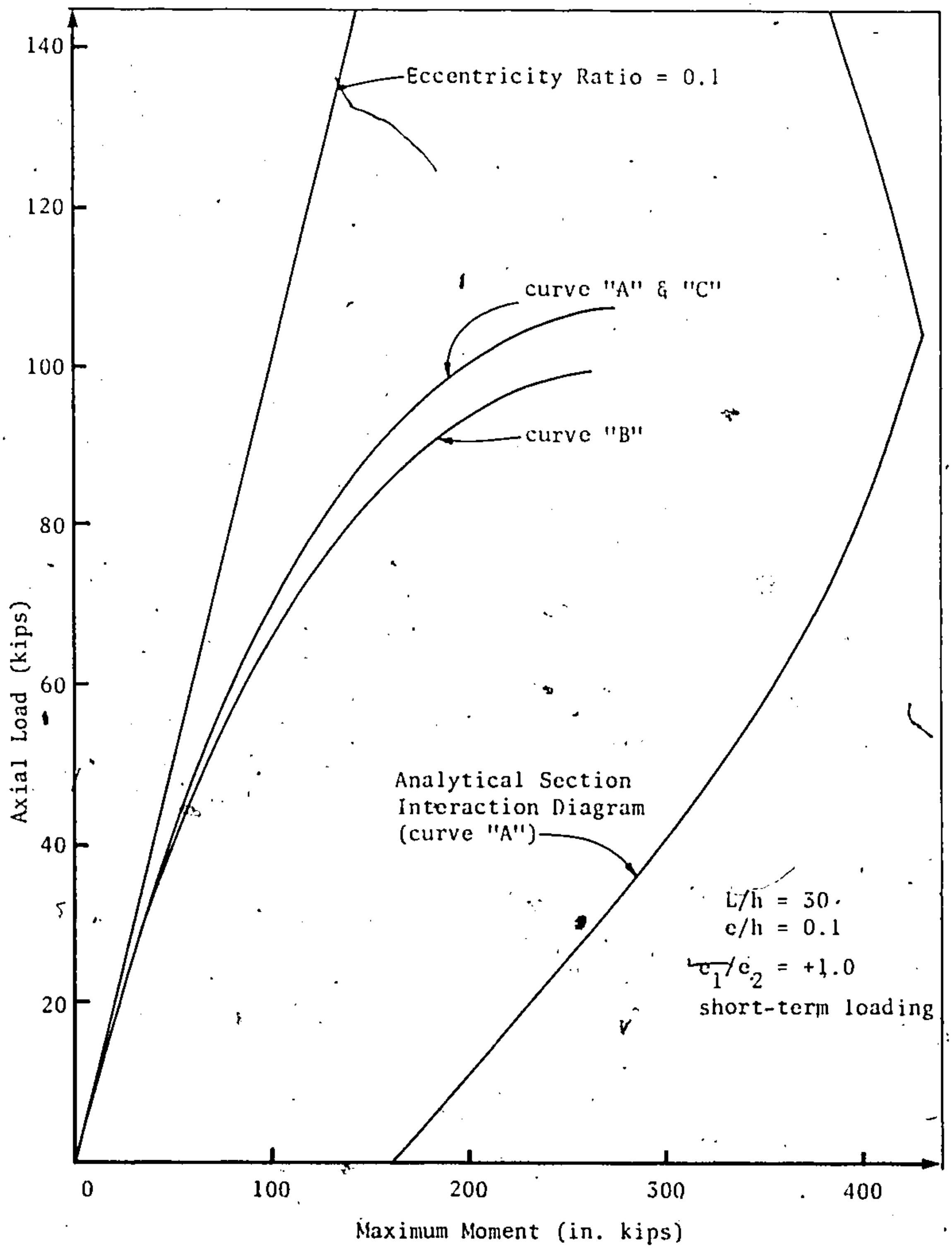

Fig. 4.5 EFFECT OF SHAPE OF CONCRETE STRESS - STRAIN CURVE

with shrinkage values equal to those used in predicting the capacities in the next chapter. The effect of shrinkage can be clearly seen to be significant in Fig. 4.6. This represents an extreme case since a typical buckling failure, in which capacity is very dependent on stiffness, occurs at this high slenderness and low e/h. This, however, is a case of practical interest since the capacities of very slender columns are usually controlled by the minimum design eccentricity suggested by North American design codes$^{(5,14)}$. Shrinkage, since it has a considerable weakening effect by increasing the deflection should therefore be considered in the analysis of slender columns.

Figure 4.7 shows the effect on this column of changing the value of the ultimate creep factor, ϕ_{cru}. A comparison of the predicted capacities of 94.2 kips, 72.6 kips, and 48.8 kips for ϕ_{cru} = 2.092, 4.185, and 6.277, respectively, indicates the significant effect of the parameter. The values of ϕ_{cru} of 4.185 for concrete of 3 ksi, and ϕ_{cru} of 3.076 for 5 ksi, based on the discussion of creep in Chapter 2, are considered sufficiently conservative to safely represent the range of practical concrete mixes.

4.4 Evaluation of the Analytical Method of Comparisons with Laboratory Tests

The accuracy of the analytical method is best evaluated by comparing laboratory test results of slender columns with predicted results. This section contains such an evaluation over a broad range of section properties and loading conditions.

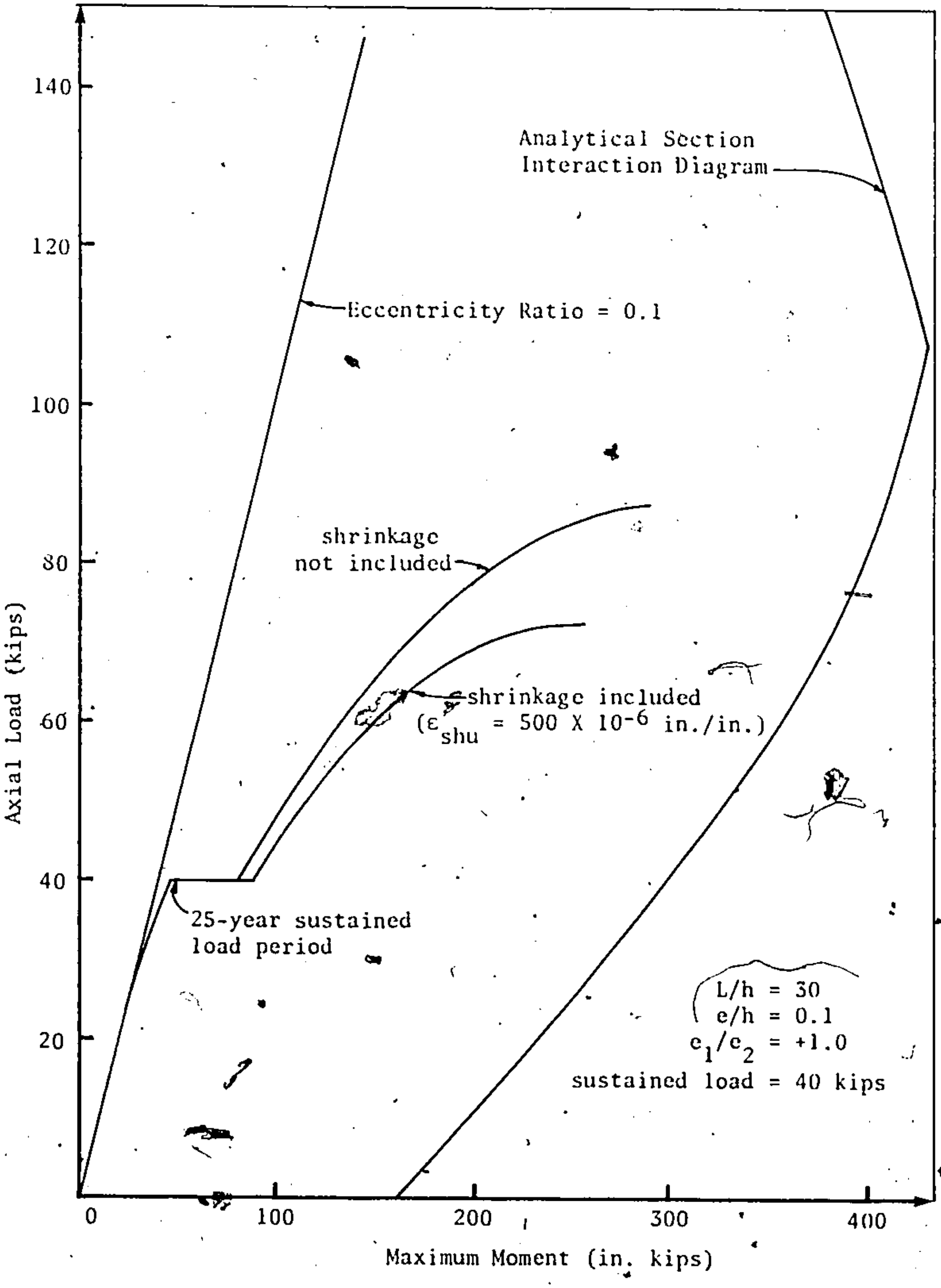

Fig. 4.6 EFFECT OF SHRINKAGE ON COLUMN CAPACITY

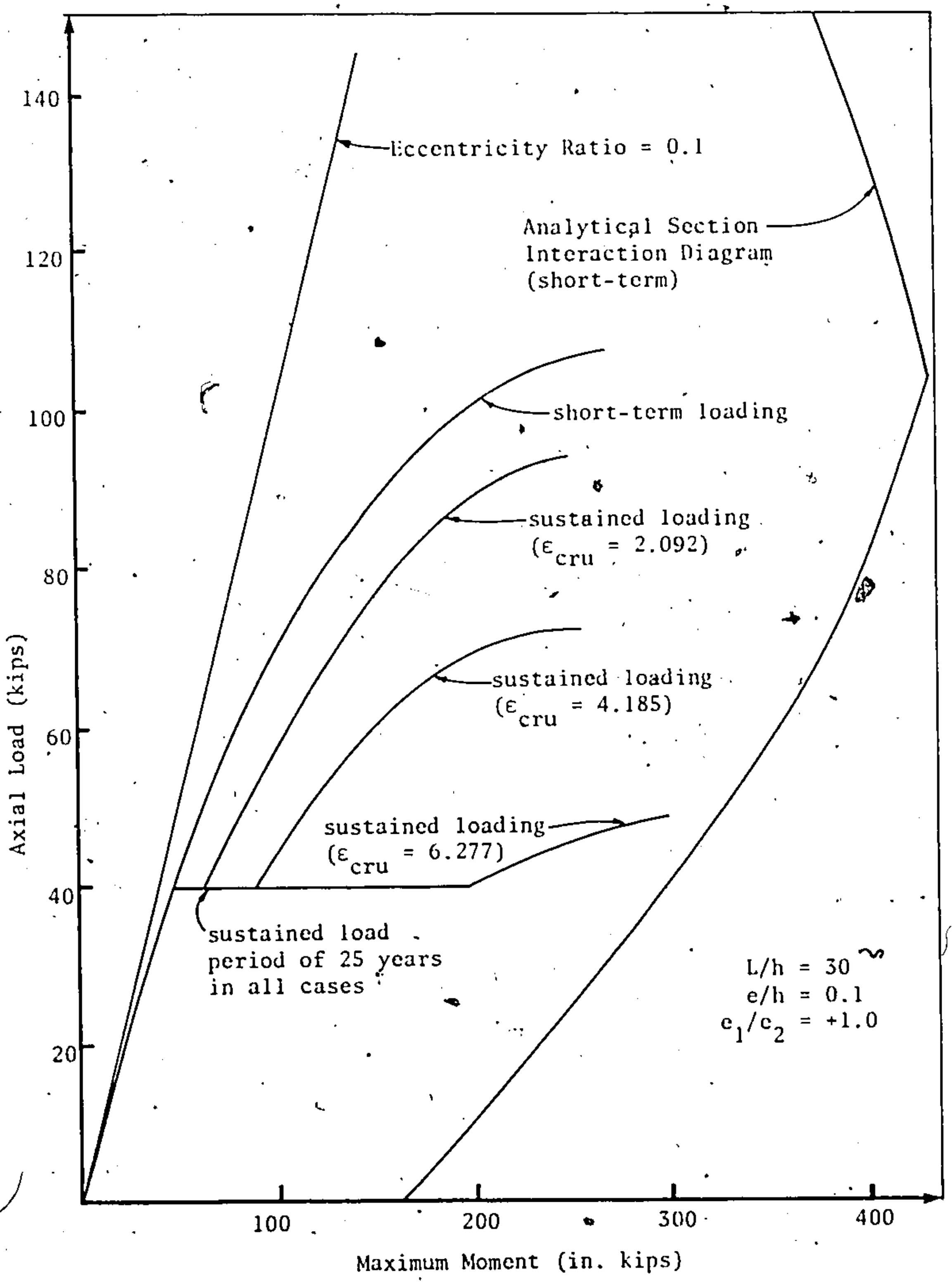

Fig. 4.7 EFFECT OF DIFFERENT CREEP RATES ON COLUMN CAPACITY

This comparison also demonstrates good examples of the different column behaviours, such as short-term and creep buckling failure, material failure, and the failure of antisymmetrically loaded columns by an unwinding buckling behaviour.

4.4.1 Comparison of Analytical Results with Tests by Drysdale:

Drysdale$^{(23)}$ reports test results of 8 slender columns loaded with symmetric uniaxial eccentric axial loads. One half of these columns were loaded to failure at an age of 28 days and these provide a good means of evaluating the analytical model for short-term loads. The other four columns failed under sustained loads at times varying from 14 to 294 days after initial loading. These provide a basis for evaluating the analytical model for column behaviour under high sustained loads.

The cross section of the columns was 5 inches square with 4 No. 4 deformed bars at 0.75 in. from the faces. The 28 day strength of the concrete was 4.40 ksi for series "D-1" and 4.23 ksi for series "D-2" as measured from standard 6 in. diameter cylinders. The average yield strength of the steel was 56.08 ksi. Ties were 0.15 inches in diameter and spaced 4 inches apart.

In this evaluation, the columns were modelled in the manner outlined in the previous chapter except for the following changes. Since the columns were cast horizontally with the top 1/2 in. of concrete being trowelled off, reductions in concrete strength due to poor compaction and water gain did not occur. For this reason, the k_3 factor was taken as 1.0 instead of the 0.85 generally used in predicting column capacities. Based on the reported increase in concrete cylinder strength with age for these columns; the ultimate percentage strength gain over the 28 day strength was taken as 18% for series "D-1" and 24% for series "D-2", instead of the 10% assumed in predicting the capacities of the columns in Chapter 5. Shrinkage was modelled as outlined in the previous chapter except that ε_{shu} was taken as 750 X 10^{-6} and that the time when shrinkage began was taken as 13 days to correlate with the reported shrinkage data. Creep was also modelled as outlined in the previous chapter except that ϕ_{cru} was taken as 3.18 based on the reported data. The total column height of 156 in. was modelled by 10 equal elements and two infinitely stiff end elements of 12-1/2 in. in height to simulate the thickened end region of the test columns.

As can be seen from Table 4.1 and Fig. 4.8, the analytical method predicts the short-term behaviour of the test columns fairly accurately. The axial load capacities are underestimated by 3% to 10% and the predicted axial load - maximum moment relationship lies between the test values. For the sustained load tests, however, predicted times of failure varies greatly from the test results as indicated in Table 4.1. This is to be expected since at high levels of sustained load on slender columns, deflections are very sensitive to changes in material properties. A plot of maximum deflection with time, as shown in Fig. 4.9, indicates a better comparison.

4.4.2 Comparison of Analytical Results with Tests by Goyal & Jackson: Goyal and Jackson(34) report test results of 46 slender columns loaded in symmetric uniaxial bending with axial load. Twenty of these columns

TABLE 4.1 COMPARISON OF ANALYTICAL RESULTS WITH TESTS BY DRYSDALE(23)

COL. REF.	L/h	A_s (in.^{2})	f_y (ksi)	e/h	f'_c (ksi)	SHORT-TERM LOADING			SUSTAINED LOADING			
						P_t	P_{an}	P_t/P_{an}	Col. Ref.	P_{sus}	Failure Time, Test (Days)	Predicted Failure Time (Days)
D-1-A	31.2	.788	56.08	0.2	4.40	38.9	37.5	1.04	D-1-C	28.7	245	155
D-1-B	31.2	.788	56.08	0.2	4.40	38.6	37.5	1.03	D-1-D	27.0	294	730
D-2-C	31.2	.788	56.08	0.2	4.23	39.7	36.8	1.08	D-2-A	30.0	83	28
D-2-D	31.2	.788	56.08	0.2	4.23	40.5	36.8	1.10	D-2-B	30.0	14	28

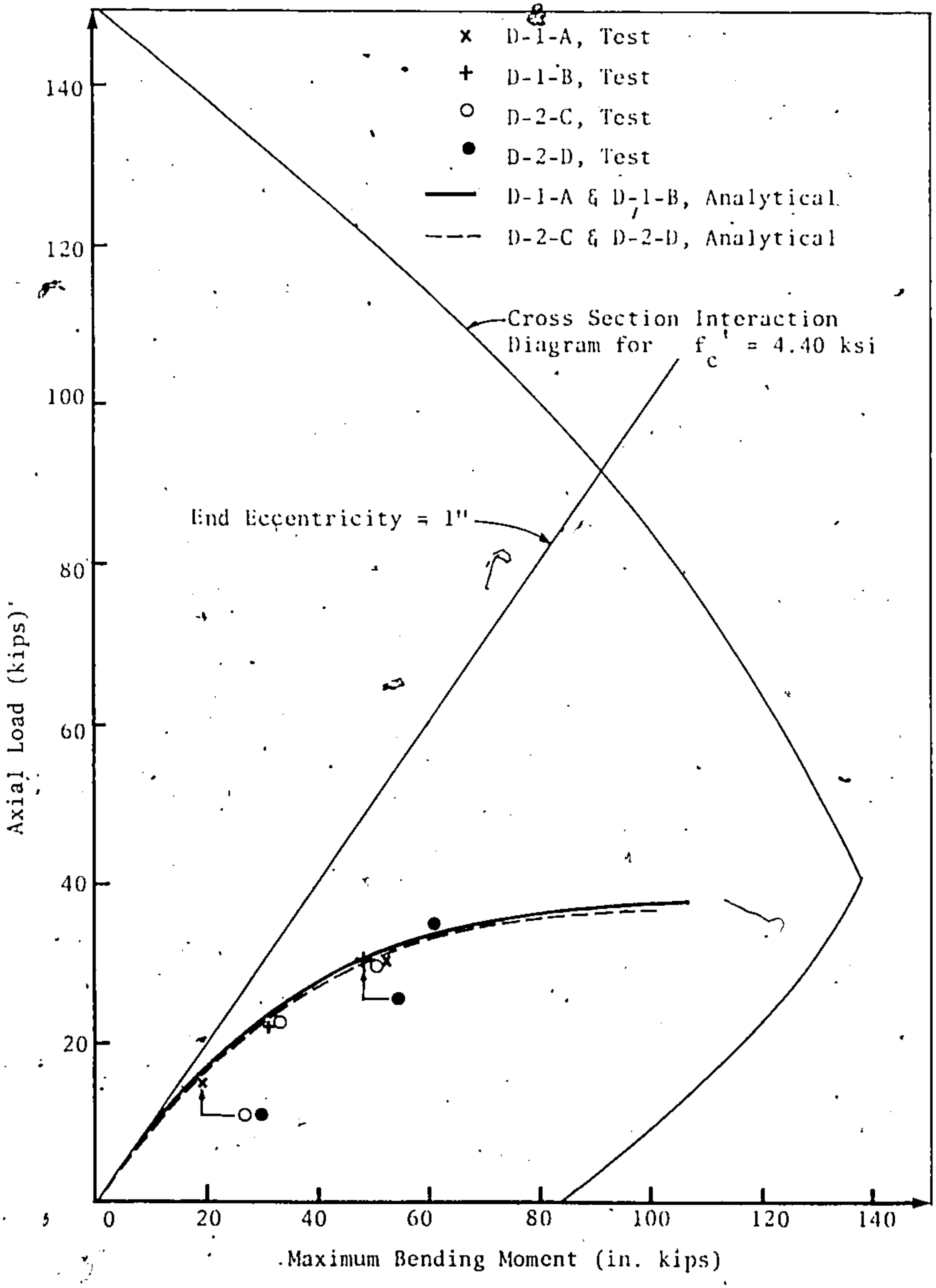

Fig. 4.8 COMPARISON OF ANALYTICAL RESULTS WITH SHORT-TERM TESTS BY DRYSDALE (23)

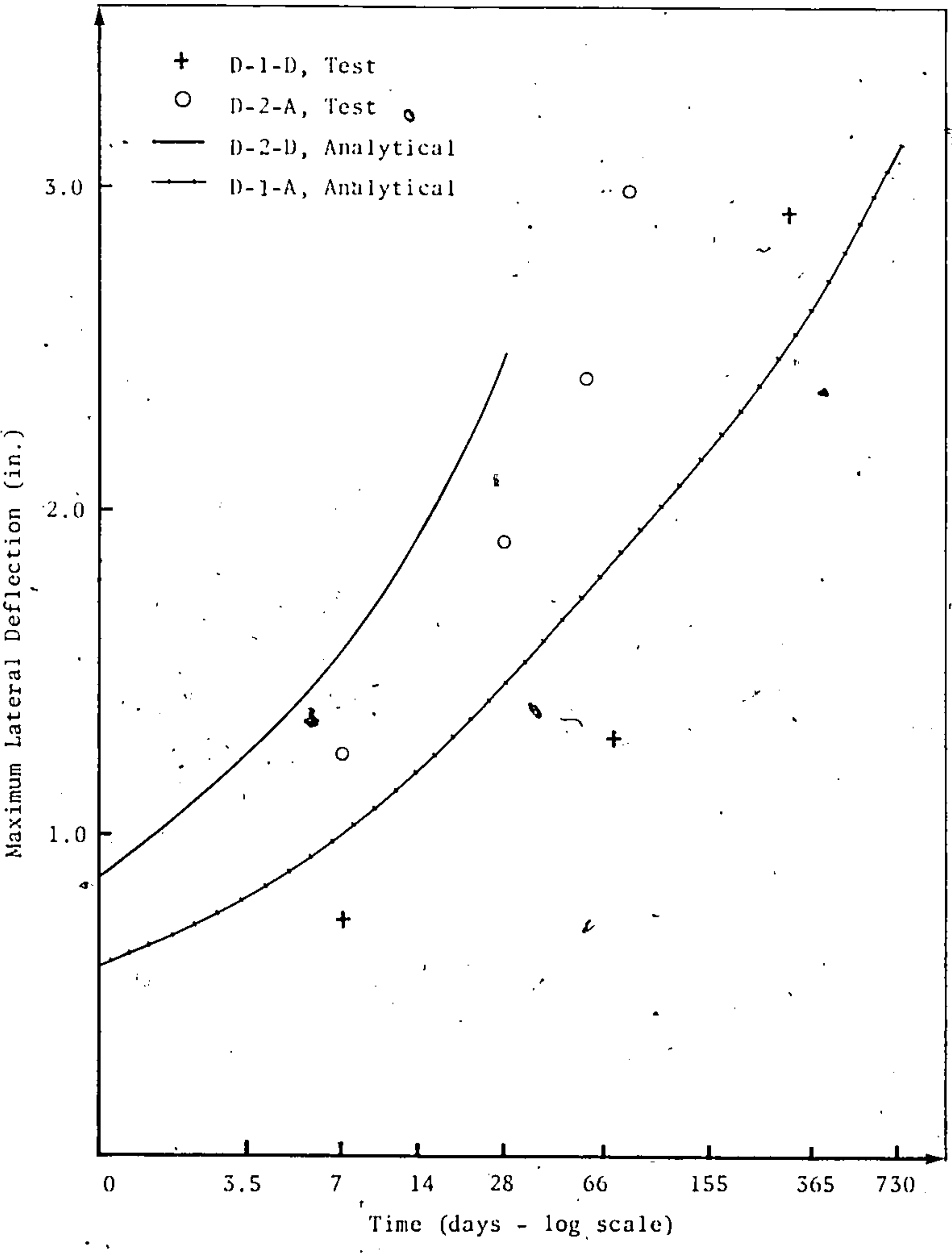

Fig. 4.9 COMPARISON OF ANALYTICAL RESULTS WITH SUSTAINED LOAD TESTS BY DRYSDALE(23)

were loaded to failure after 6 months under sustained load. One half of the remainder were tested for short-term capacity at 28 days while the other half were tested for short-term capacity at 7 months. The tests provide an excellent basis for evaluation of the analytical model in predicting column capacities after sustained load.

The cross section of the columns was 3 in. square. Column length, steel area, and the yield strength of the steel, which differed between the specimens, are listed in Table 4.2. The ties were of the same diameter as the longitudinal bars and were spaced 3 in. apart.

Standard 6 in. cylinders and 3 in. X 3 in. X 9 in. prisms were cast from each concrete batch. All of the specimens were removed from their moulds after 1 day and were cured at approximately 20°C and 92% relative humidity for a further six days. The prisms indicated a concrete strength with an average of 72.5% of the strength indicated by the cylinders. This is lower than usual, but can be explained by the smaller size of the prisms. Since both prisms and columns had the same cross section and were horizontally cast, the strength of the concrete should be similar in both. In this evaluation, the concrete strength was taken as given by the prisms and the k_3 factor was taken as 1.0. Since no significant increase in concrete strength with age was found, concrete strength gain was not included in the evaluation.

Creep and shrinkage were modelled as outlined in the previous chapter except that ϕ_{cru} was taken as 3.12 based on the creep data reported and that ε_{shu} was assumed at 500 X 10^{-6} in./in. The column heights were modelled by 10 equal height elements and two infinitely stiff end element of 6 in. in height to simulate the actual end regions.

The test and predicted column capacities are given and compared in Table 4.2. It is seen that the capacities of the short-term loaded columns are predicted with good accuracy. Values of P_t/P_{an} range from 0.91 to 1.12 and have an average of 0.998. The analytical method tended to be a little conservative in the case of sustained load, but accuracy can still be regarded as being reasonable. For these columns, values of P_t/P_{an} ranged from 0.92 to 1.27 with an averge of 1.077 for the 20 columns.

The comparison for the 46 columns is especially significant in that major column parameters such as slenderness, eccentricity, percentage steel area, and the sustained load level varied.

Figure 4.10 shows the predicted and experimental axial load versus maximum moment relationship for Column C2. A typical material failure of the column is indicated by the fact that the maximum moment in the column is at the section capacity.

4.4.3 Comparison of Analytical Results with Tests by Green & Hellesland:

In their study of repeated load tests on columns, Green and Hellesland(38) subjected two columns of medium slenderness to short-term load to failure. The columns were 5 in. X 7 in. in cross section and had a height of 75 in. The vertical reinforcement consisted of four #3 bars in one and four #5 bars in the other. Ties were 1/8 in. diameter and spaced 4 in. on centre. Concrete cylinder strength was close to 5 ksi. Both columns were loaded in symmetrical curvature with an eccentricity ratio of approximately 0.1. Steel yield strengths were in the region of

TABLE 4.2 COMPARISON OF PREDICTED CAPACITIES WITH TESTS BY GOYAL AND JACKSON(34)

COL. REF.	L/h	A_s (in^2)	f_y (ksi)	e/h	f'_{pr} (ksi)	SHORT-TERM LOADING			SUSTAINED LOADING				
						P_t (kips)	P_{an} (kips)	P_t/P_{an}	Col. Ref.	P_{sus} (kips)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
A1	24	0.220	51	0.500	2.89	7.45	7.62	.98	A	4.47	7.19	6.18	1.06
A2	24	0.220	51	0.500	2.89	7.50	7.60	.99	B	2.98	7.26	7.19	1.01
C1	24	0.220	51	0.333	3.38	10.00	10.80	.93	C	6.00	9.65	9.35	1.03
C2	24	0.220	51	0.333	3.38	10.52	10.60	.99	D	4.00	9.08	9.87	.92
E1	24	0.220	51	0.167	3.18	15.00	15.18	.99	E	9.00	13.35	12.11	1.10
E2	24	0.220	51	0.167	3.18	14.70	15.00	.98	F	6.00	13.33	13.29	1.00
G1	24	0.220	51	0.250	3.22	12.45	12.33	1.01	G	7.50	11.26	10.34	1.09
G2	24	0.220	51	0.250	3.22	11.92	12.12	.98	H	5.00	11.20	11.04	1.01
I1	24	0.154	45	0.167	3.29	13.50	13.43	1.01	I	8.10	9.95	10.07	.99
I2	24	0.154	45	0.167	3.29	12.90	13.22	.98	J	5.40	13.08	11.26	1.16
K1	24	0.154	45	0.250	3.30	10.47	10.44	1.00	K	6.28	9.19	8.33	1.10
K2	24	0.154	45	0.250	3.30	10.25	10.18	1.01	L	4.19	9.85	9.10	1.08
M1	24	0.154	45	0.333	3.32	8.35	8.51	.98	M	5.00	8.18	7.00	1.17
M2	24	0.154	45	0.333	3.32	8.32	8.40	.99	N	3.33	8.09	7.64	1.06

continued ....

TABLE 4.2 COMPARISON OF PREDICTED CAPACITIES WITH TESTS BY GOYAL AND JACKSON[34] (Cont'd)

COL. REF.	L/h	A_s (in^2)	f_y (ksi)	e/h	f'_{pr} (ksi)	SHORT-TERM LOADING			SUSTAINED LOADING				
						P_t (kips)	P_{an} (kips)	P_t/P_{an}	Col. Ref.	P_{sus} (kips)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
O1	16	0.154	45	0.167	3.43	18.50	19.02	.97	O	11.10	20.05	15.77	1.27
O2	16	0.154	45	0.167	3.43	20.77	18.71	1.11	O	11.10	20.05	15.77	1.27
P1	16	0.154	45	0.250	3.43	14.50	14.92	.97	P	8.70	15.08	13.05	1.16
P2	16	0.154	45	0.250	3.43	16.35	14.64	1.12	P	8.70	15.08	13.05	1.16
Q1	16	0.154	45	0.333	2.89	11.55	11.07	1.04	Q	6.90	11.28	9.61	1.17
Q2	16	0.154	45	0.333	2.89	11.00	10.86	1.01	Q	6.90	11.28	9.61	1.17
R1	16	0.154	45	0.167	3.15	7.52	7.19	1.05	R	4.50	5.41	5.24	1.03
R2	36	0.154	45	0.167	3.15	7.00	6.77	1.03	R	4.50	5.41	5.24	1.03
S1	36	0.154	45	0.250	3.07	5.17	5.63	.92	S	3.15	4.85	4.68	1.04
S2	36	0.154	45	0.250	3.07	5.47	5.43	1.01	S	3.15	4.85	4.68	1.04
T1	36	0.154	45	0.333	3.05	4.37	4.82	.91	T	2.62	4.43	4.05	1.09
T2	36	0.154	45	0.333	3.05	4.62	4.67	.99	T	2.62	4.43	4.05	1.09

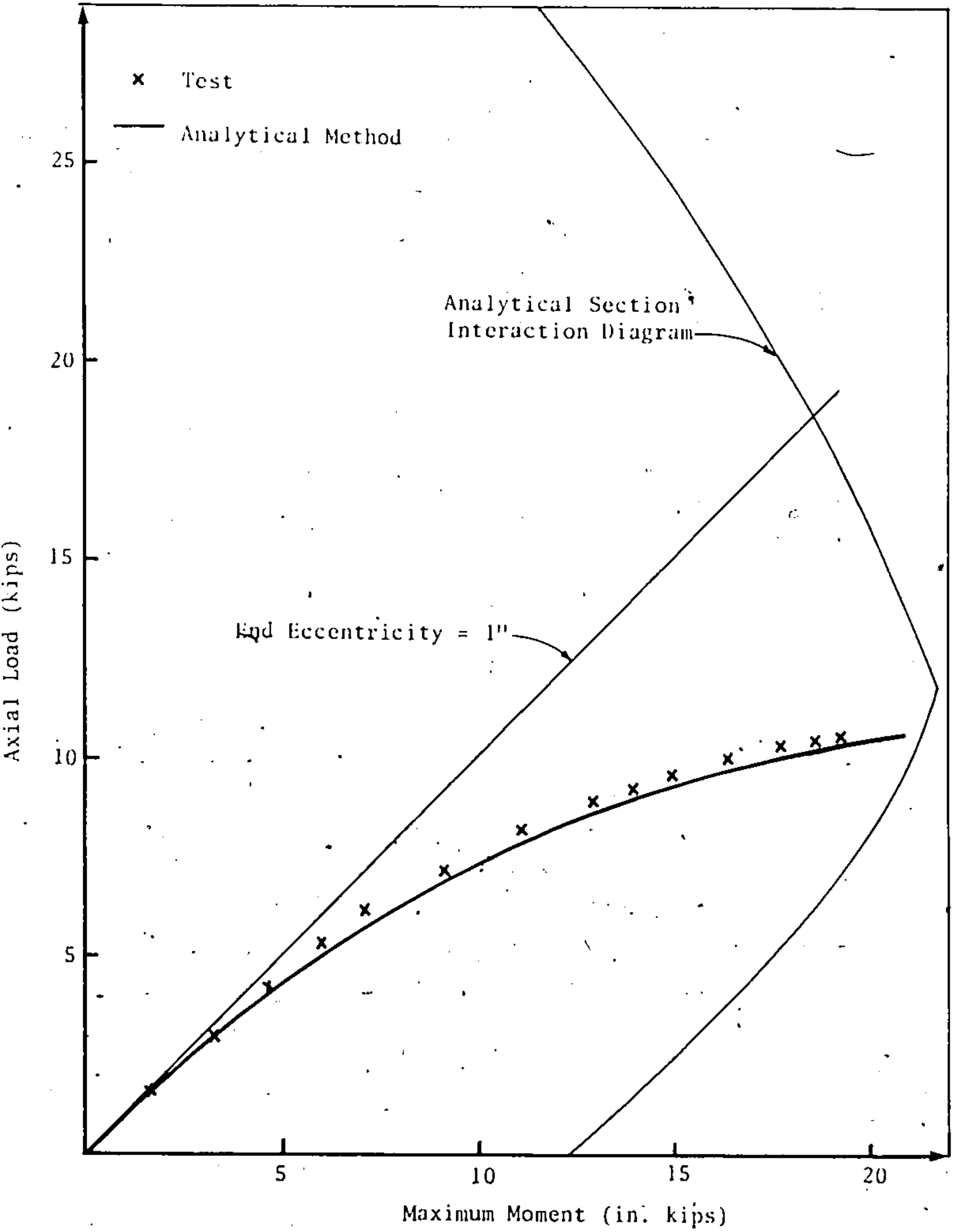

Fig. 4.10 COMPARISON OF PREDICTED BEHAVIOUR WITH COLUMN "C2" TESTED BY GOYAL AND JACKSON(34)

60 ksi. The columns were moist cured for 8 days and tested at an age of 24 days.

The simulation of these tests by the analytical method were based on the actual reported values of the parameters. A k_3 factor of 0.9 was used since the columns were horizontally cast. Column test capacities were reported as 112.8 kips and 139.6 kips. The corresponding analytical results were 118.4 kips and 156.5 kips respectively giving values of P_t/P_{an} of 0.95 and 0.89.

4.4.4 Comparison of Analytical Results with Tests by Chang and Ferguson: Chang and Ferguson(16) report test results of six slender columns loaded with symmetric uniaxial eccentric axial loads. The columns were 4-1/16 in. X 6-1/8 in. in cross section and had a height of 126 in. The vertical reinforcement consisted of four #3 bars and the ties were #12 gauge at 4 in. on centre. The eccentricity ratio ranged from approximately 0.06 to 0.39. The material properties of the columns are listed in Table 4.3.

When predicting the capacities of these columns by the analytical method, a k_3 factor of 0.9 was used on the assumption that the columns were horizontally cast.

A comparison of the predicted and actual column capacities, given in Table 4.3, indicates that the analytical method predicted higher capacities. The average value of P_t/P_{an} for the six tests was 0.917.

4.4.5 Comparison of Analytical Results with Tests by MacGregor and Barter: Short-term tests of four unrestrained columns loaded with antisymmetric uniaxial eccentric axial loads are reported by MacGregor

TABLE 4.3 COMPARISON OF ANALYTICAL RESULTS WITH TESTS BY CHANG AND FERGUSON(16)

COL. REF.	L/h	A_s (in.^{2})	f_y (ksi)	e/h	f_c' (ksi)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
1	31.02	.4418	48.5	0.073	3.385	37.8	38.4	.98
2	31.02	.4418	48.5	0.389	5.070	15.5	18.3	.85
3	31.02	.4418	48.5	0.061	4.190	42.6	47.8	.89
4	31.02	.4418	48.5	0.382	4.360	16.3	17.5	.93
5	31.02	.4418	48.5	0.208	4.750	27.6	27.3	1.01
6	31.02	.4418	57.5	0.064	4.870	44.4	53.1	.84

TABLE 4.4 COMPARISON OF ANALYTICAL RESULTS WITH TESTS BY MacGREGOR AND BARTER(48)

COL. REF.	L/h	A_s (in.^{2})	f_y (ksi)	e_2/h	f_c' (ksi)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
A-1	27.3	.4418	44.7	0.2	4.88	37.95	39.75	.96
A-2	27.3	.4418	44.7	0.2	4.74	38.00	39.00	.97
B-1	27.3	.4418	44.7	1.5	4.21	7.45	7.00	1.06
B-2	27.3	.4418	44.7	1.5	4.73	7.06	7.11	.99

and Barter(48). The columns were 2.5 in. X 4.4 in. in cross section and had a total height of 68.25 in. The vertical reinforcement consisted of four #3 bars and the ties were made of #10 black annealed wire and spaced 2.5 in. apart. The concrete cylinder strength, f_c', was in the region of 4.5 ksi. The columns were loaded with an end eccentricity ratio, e_1/e_2 equal to -1.0 with eccentricity ratios, e/h, of 0.2 and 1.5.

Since the columns were horizontally cast, a k_3 factor of 0.9 was used for the prediction of the column capacities by the analytical method. Exact antisymmetric curvature is never realized in practice due to imperfections inherent in the column construction. These imperfections can significantly reduce the capacity of an antisymmetrically loaded column by causing an unwinding of the column to occur. To simulate these imperfections in the analytical method, it is necessary to include some small asymmetry in the end eccentricities. This was done by reducing one end eccentricity to give an end eccentricity ratio, e_1/e_2, equal to -0.98.

Table 4.4 indicates that the accuracy in predicting the column capacities is good. The average value of P_t/P_{an} for the four columns is equal to 0.995. It should be noted that the failure of the columns with e/h equal to 1.5 occurred at the ends and therefore slenderness effects did not reduce the capacity. This is also predicted by the analytical method.

The columns with e/h equal to 0.2 are good experimental examples of the unwinding buckling failure which occurs for antisymmetrically loaded columns. Figure 4.11 shows a comparison of the deflection profiles recorded during the test with those predicted by the analytical method. Although the maximum deflection is underestimated by the analytical method, it is seen that the use of an end eccentricity ratio, e_1/e_2, equal to -0.98 is sufficient to allow unwinding to occur.

4.4.6 Comparison of Analytical Results with Tests by Martin and Olivieri:(53) Two of these columns were concentrically loaded. The other six were loaded uniaxially with an end eccentricity ratio of -0.5 The columns were 3.543 in. X 5.0 in. in cross section and had a total height of 141.72 in. The vertical reinforcement consisted of four #3 bars and ties were made from #12 wire and spaced 3 in. apart. The concrete cylinder strength, f_c', ranged from 3.53 ksi to 5.41 ksi.

The concrete strength of the horizontally cast columns was simulated by using a k_3 factor of 0.9. In order to account for imperfections in the columns, the concentrically loaded columns were simulated by using a small symmetric eccentricity ratio, e/h, equal to 0.01.

Table 4.5 indicates a fair agreement between the capacities predicted by the analytical method and the test results. The average value of P_t/P_{an} for the eight columns is 1.043. In particular, it can be noted that the predicted capacities of the concentricaly loaded columns agree with the test results. This indicates that column stiffness was accurately predicted.

TABLE 4.5 COMPARISON OF ANALYTICAL RESULTS WITH TESTS BY MARTIN AND OLIVIERI (53)

COL. REF.	L/h	A_s (in.^{2})	f_y (ksi)	e_2/h	f_c' (ksi)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
402-1	40	.4418	40	0	4.35	33	33.1	1.00
402-2	40	.4418	40	0	3.53	28	28.3	.99
412-1	40	.4418	40	0.211	4.88	26.5	26.1	1.02
412-2	40	.4418	40	0.211	3.63	20	20.9	.96
422-1	40	.4418	40	0.388	5.06	21	17.8	1.18
422-2	40	.4418	40	0.388	3.73	17	15.0	1.13
432-1	40	.4418	40	0.282	5.41	21.5	23.4	.92
432-2	40	.4418	40	0.282	3.83	21	18.4	1.14

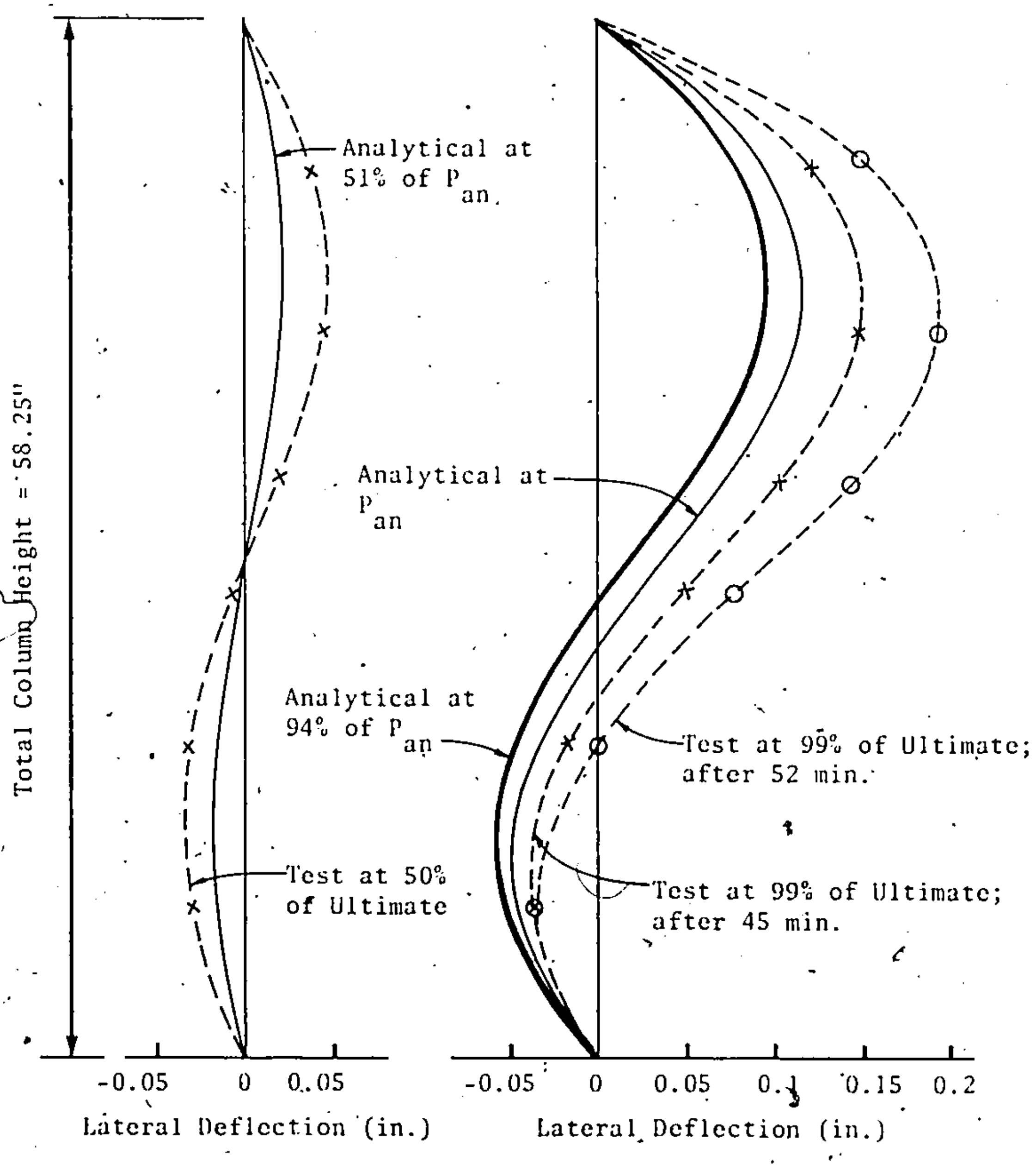

Fig. 4.11 COMPARISON WITH ANTISYMMETRICALLY LOADED COLUMNS OF MacGREGOR AND BARTER(48)

The concentrically loaded columns are good examples of buckling failures. Figure 4.12 shows the predicted axial load versus maximum moment relationship and recorded test values for these columns. It is seen that deflections increased rapidly near failure and that the maximum bending moment at failure was significantly less than the section capacity.

4.4.7 Summary of the Comparison of the Analytical Results with Laboratory Tests: It has been shown that the capacities predicted by the analytical method agree fairly well with laboratory tests over a broad range of section properties and loading conditions. For the total range of tests, values of P_t/P_{an} ranged from 0.84 to 1.27 and had an average of 1.019.

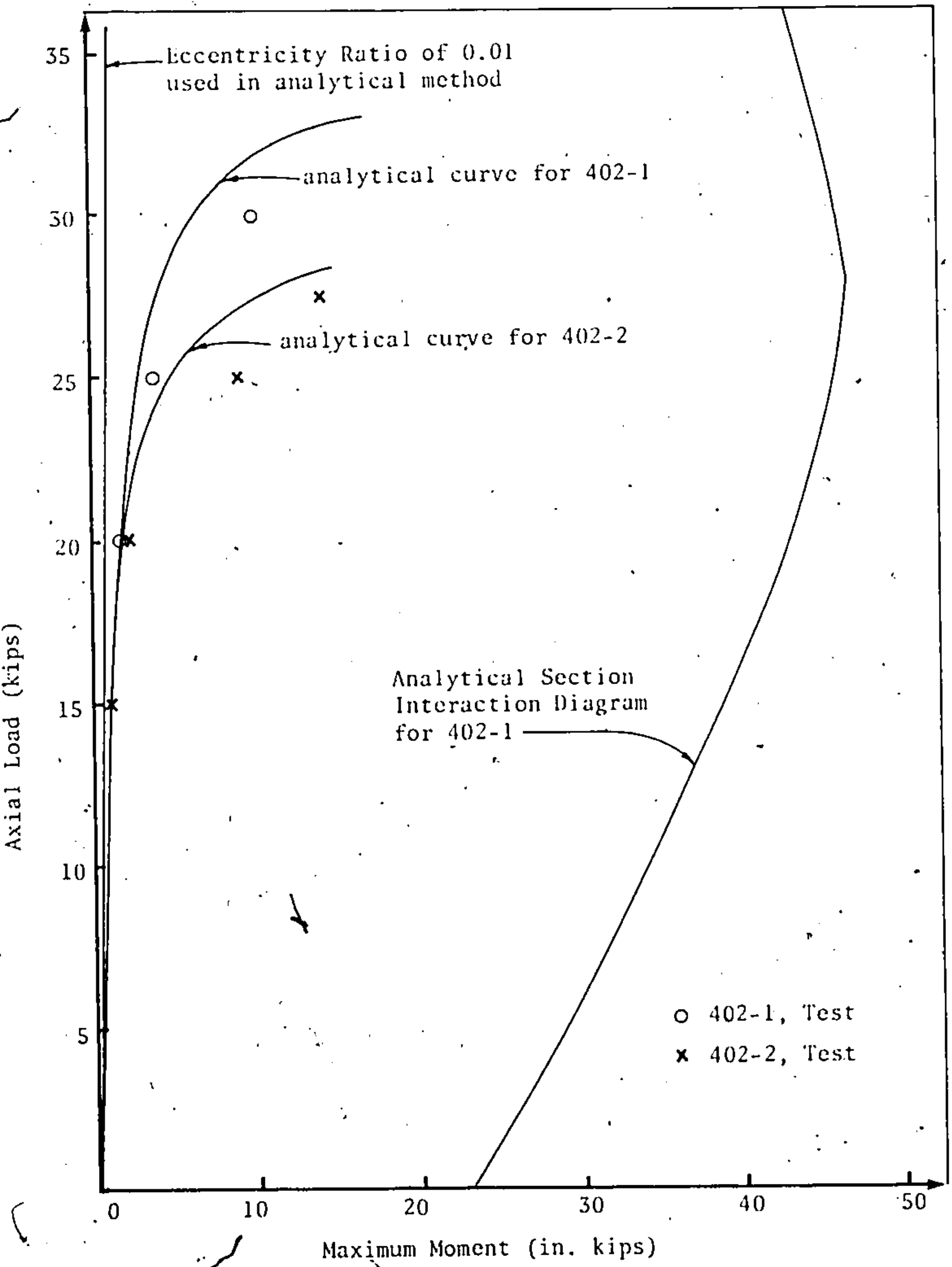

Fig. 4.12 COMPARISON WITH CONCENTRICALLY LOADED TESTS OF MARTIN AND OLIVIERI(53)

CHAPTER 5

DEVELOPMENT OF A SIMPLER DESIGN METHOD

5.1 Introduction

An analysis of the capacity of a slender reinforced concrete column by the present ACI Moment Magnifier Method is an iterative procedure since the axial load is needed to determine the moment magnification.

A much more troublesome iterative process occurs when the method is used for design, since the moment magnification depends on the section properties, some of which have yet to be chosen and depend on the magnified moment. The introduction of charts for use with section capacity interaction diagrams such as those presented by Furlong(30) has been a valuable contribution in helping to lighten the designers' burden. However, the design of a slender column remains far more tedious than that of a short column. Since the final stage of the design of reinforced concrete members is usually that of refining the area of steel, the design of a slender column for strength considerations would be made much easier if slenderness could be accounted for by a method which would not depend on this parameter.

It has been reported(25,28,72) that the ACI Moment Magnifier Method leads to quite inaccurate results for some column sections under certain loading conditions. It seemed logical, then, to think that a simpler method with the same degree of accuracy might be found.

In this chapter, the development of a moment magnification method which does not require a prior knowledge of steel area or steel position is discussed. The accuracy and limitations of this method are investigated and compared with other design methods.

5.2 Preliminary Study

The difficulty associated with a method for designing slender columns increases as the number of section properties on which it depends increases.

The depth and breadth of a column section are usually chosen in the early stages of design for frame analysis or for consistency with other structural elements. Also, the material properties are usually chosen on a basis other than column design. Therefore, the exclusion of the area of steel and its position, as parameters in a method, would greatly increase its potential for ease of use.

Two obvious ways of accounting for slenderness are to increase the design axial load or to increase the design moment. The concept of increasing design load is familiar to designers in North America in the form of the previous ACI Reduction Factor Method. Although it is very easy to use, this method is no longer recommended for use because of its inherent inaccuracy(28,49). The concept of increasing design moments is also historically familiar to European designers in the form of the 1963 CEB Recommendations as reviewed by Martin, MacGregor, Pfrang, Breen(52). This method can also be regarded as being a simple design tool since iterations for section properties are eliminated. The 1970

CEB Recommendations, however, propose a different concept which necessarily incorporates section properties. It is of interest to note that MacGregor, Breen, Pfrang(49), when presenting the present ACI Moment Magnifier Method investigated the method from the 1963 CEB Recommendations and found it to be more accurate than the ACI Moment Magnifier Method for the range of parameters studied. The latter was favoured, however, on the basis of its rationality and its familiarity to those versed in steel design and because it was considered as easy to use as the CEB method. The latter conclusion is quite surprising and could only have been based on the assumption that the value of EI for the ACI method could be adequately expressed by the second proposed equation for EI which does not include steel properties(49). This equation has since been reported as being too inaccurate for use and recommendations have been made for its replacement by an equation which does include the steel percentage(50). The method from the 1963 CEB Recommendations must be considered as being considerably easier to use than the ACI Moment Magnifier Method once steel area is required.

To investigate the possiblity of finding a fairly accurate simple method, independent of the area of steel and its position, two series of columns which had quite different steel properties, were initially studied. The steel yield strength and concrete strength were taken as 40 ksi and 3 ksi, respectively. Both columns had 10 in. square cross sections with two equal layers of steel. The first column, labelled Column 1, had a percentage steel ratio of 1.0% and a distance between the steel layers of 6.5 in. The second, labelled Column 11, had a steel percentage of 4.0% and a distance between the steel layers of 8.5 in. These columns represent two extremes of steel importance on column behaviour and should provide a rough basis for comparing methods which are independent of the steel parameters. The column slenderness ratio, L/h was taken as 30 and an end moment ratio, e_1/e_2, of +1.0 was used in an effort to create extreme conditions.

Table 5.1 lists the capacities of these columns for these conditions at e/h equal to 0.1, 0.25, 0.5, and 1.0. Column capacities are the ultimate capacities predicted by the analytical method and do not include the capacity reduction factors, Ø. Table 5.1 also gives the moment magnification, δ_{an}, for each case. This value was calculated by using the anlytical method to estimate the moment capacity of the section when carrying an axial load equal to the slender column capacity. Conversely, the slender column capacity is indicated on a section interaction diagram when the eccentricity is taken as the eccentricity of the load on the column multiplied by this moment magnification. It should be noted that the moment magnification cannot be taken as the maximum moment of the column at the highest equilibrium load since this does not lie on the section interaction diagram when the column failure is caused by buckling.

The reduction in column capacity from that of a short column, R_{an}, is also listed in Table 5.1. It is seen that while reduction factors, R_{an}, vary considerably for the two sections, the values of moment magnification factors, δ_{an}, although greatly dependent on e/h,

TABLE 5.1 AN INITIAL STUDY OF A DIRECT MOMENT MAGNIFICATION METHOD

	Column 1				Column 11			
e/h	0.1	0.25	0.5	1.0	0.1	0.25	0.5	1.0
Analytical Section Capacity (kips)	222	150	79	24.5	320	239	165	96
P_{an} (kips)	107	55	30.5	15.5	206	146	105	66
R_{an}	0.482	0.367	0.380	0.634	0.644	0.611	0.636	0.688
δ_{an}	3.98	2.50	1.77	1.40	3.43	2.44	1.84	1.39
P_r (kips)	107	55	30.5	15.5	154	87.7	62.7	60.9
$\text{Error}_{(r)}$ (%)	0	0	0	0	25	40	40	8
P_δ (kips)	107	55	280	15.5	189	143	105	65.5
$\text{Error}_{(\delta)}$ (%)	0	0	8	0	8	2	0	1

Note: Loading Conditions - $L/h = 30$, $e_1/e_2 = +1$, $P_{sus}/P_{an} = 0.0$

are within acceptable agreement for the two columns for a certain eccentricity. This suggests that the concept of magnifying moments to account for slenderness offers more potential, as a direct method independent of the steel parameters, than the concept of reducing section axial load capacity.

To illustrate this the smaller reduction factor of the two columns was noted for each eccentricity ratio. This was then used to predict the capacity of the other column. The error associated with this can be found by comparing the capacity predicted in this way, P_r, to the actual capacity predicted by the analytical method. A numerical value for this error on a percentage basis can be calculated from

$$\text{Error}_{(r)} = \frac{P_{an} - P_r}{P_{an}} \times 100\% \qquad \ldots\ldots (5.1)$$

A similar error estimate for a method using moment magnification can be calculated from

$$\text{Error}_{(\delta)} = \frac{P_{an} - P_\delta}{P_{an}} \times 100\% \qquad \ldots\ldots (5.2)$$

where P_δ is the column capacity predicted by using the greater of the values of δ_{an} for each eccentricity.

Both these errors are also included in Table 5.1. No errors occur for the columns which produced the smaller reduction factor or the largest moment magnification. It is seen that the maximum conservative errors are 40% for the reduction method and 8% for the moment magnification approach.

Although it was expected that these errors would increase as other cases are included in the range, there was a strong reason to continue the investigation of the concept of directly magnifying the moments.

5.3 The Effects of Section Properties on Required Moment Magnifications

The formulation of any empirical method must involve a systematic study of its safety throughout a broad range of the variables involved. The development of a direct moment magnification method is one of identifying section properties which could be excluded without causing high levels of inaccuracy and it involves the documentation of magnification values to give safe results throughout the range of the variables. Because of the large number of variables associated with loading conditions and section properties, an effort was made in the early stages to identify the importance of each section parameter.

Figures 5.1 to 5.4 show the effect of section properties on the moment magnification, δ_{an}, for a slenderness ratio, L/h, of 30, and a moment ratio, e_1/e_2, of +1.0 for short-term loading. Figures 5.1 and 5.2 are for eccentricity ratios, e/h, of 0.1, whereas the effects at e/h equal to 0.5 are shown in Figs. 5.3 and 5.4. For these loading conditions, the following observations may be made.

1. Effect of f_c': The effect of varying f_c' is quite variable and it can result in increased or decreased δ_{an}, depending on the other properties and e/h. It can, however, be regarded as linear for a specific set of properties and the extremes of δ_{an} are found at the extremes of f_c'.

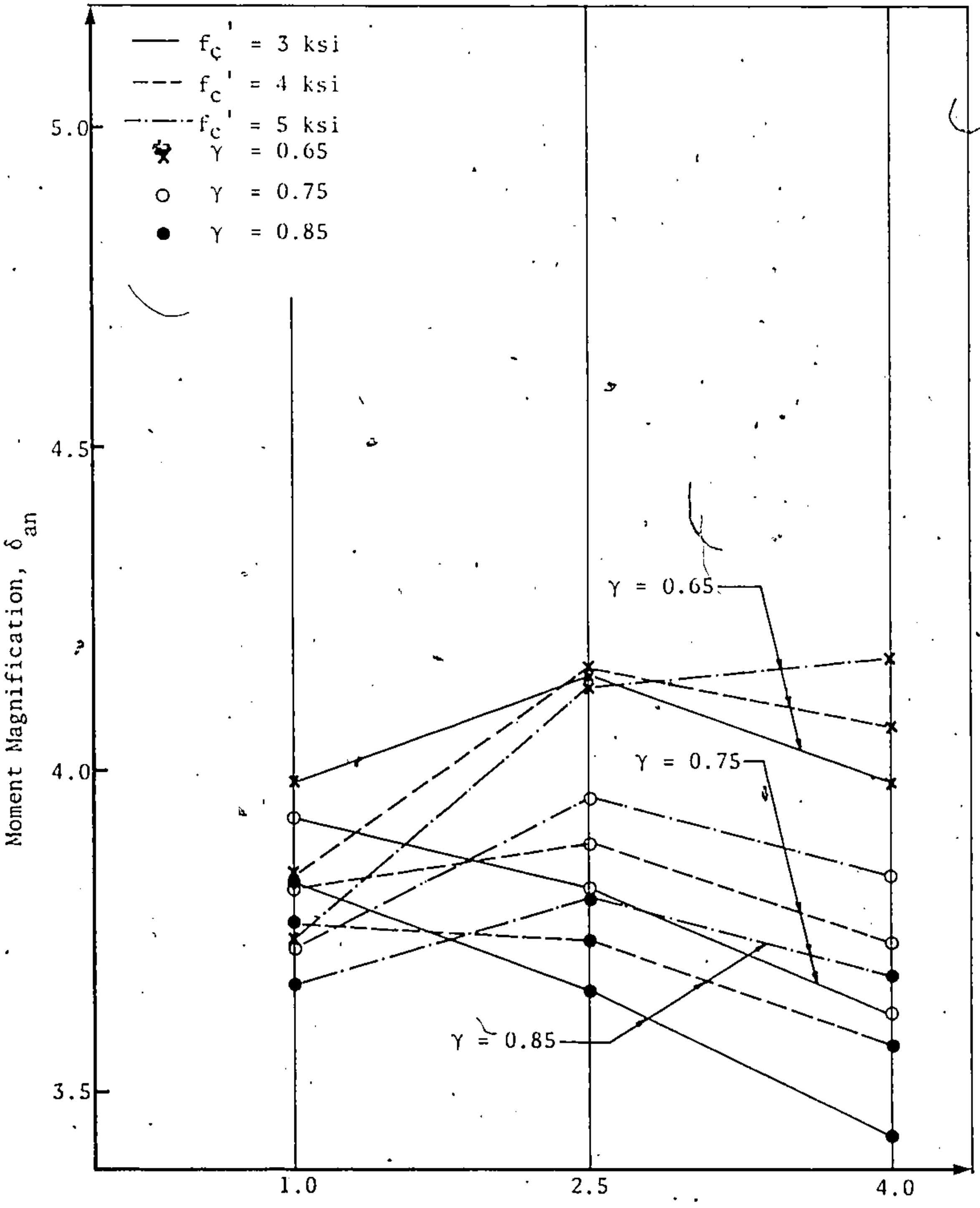

Fig. 5.1 EFFECT OF SECTION PROPERTIES ON δ_{an} FOR f_y = 40 ksi, $e/h = 0.1$, $L/h = 30$, $P_{sus}/P_{an} = 0$, $e_1/e_2 = 1.0$

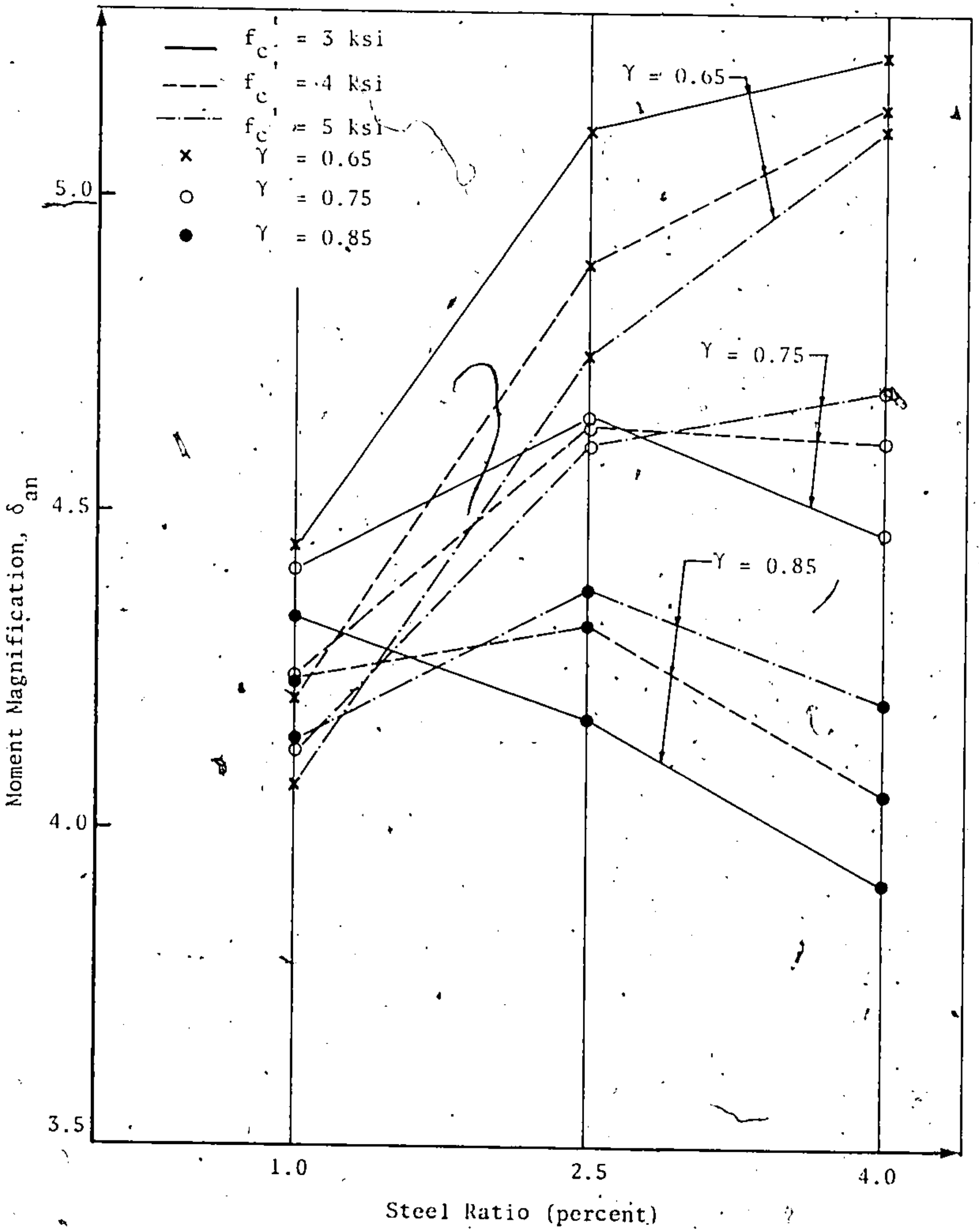

Fig. 5.2 EFFECT OF SECTION PROPERTIES ON δ_{an} FOR f_y = 60 ksi, e/h = 0.1, L/h = 30, P_{sus}/P_{an} = 0, e_1/e_2 = 1.0

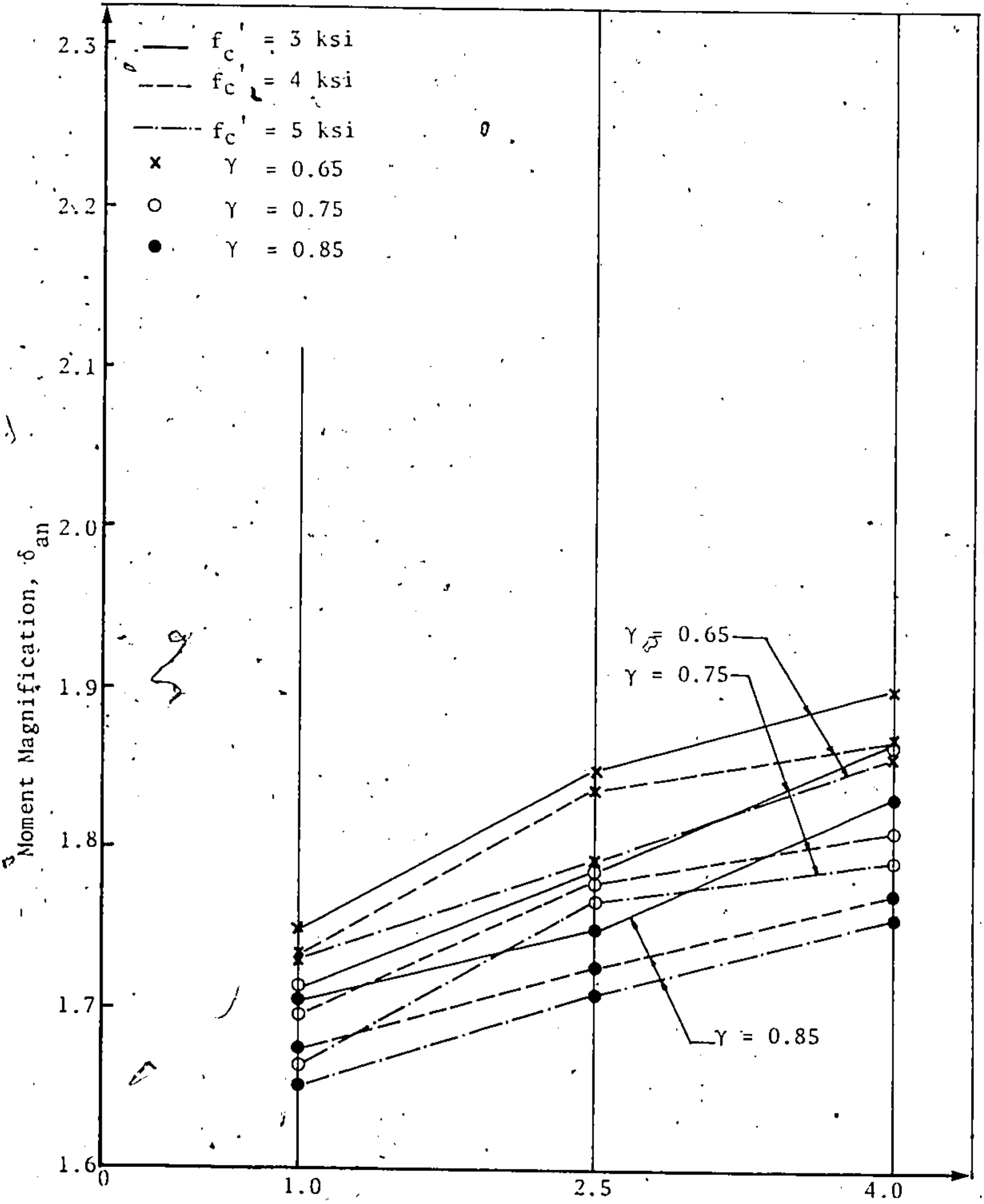

Fig. 5.3. EFFECT OF SECTION PROPERTIES ON δ_{an} FOR $f_y = 40$ ksi, $e/h = 0.5$, $L/h = 30$, $P_{sus}/P_{an} = 0$, $e_1/e_2 = 1.0$

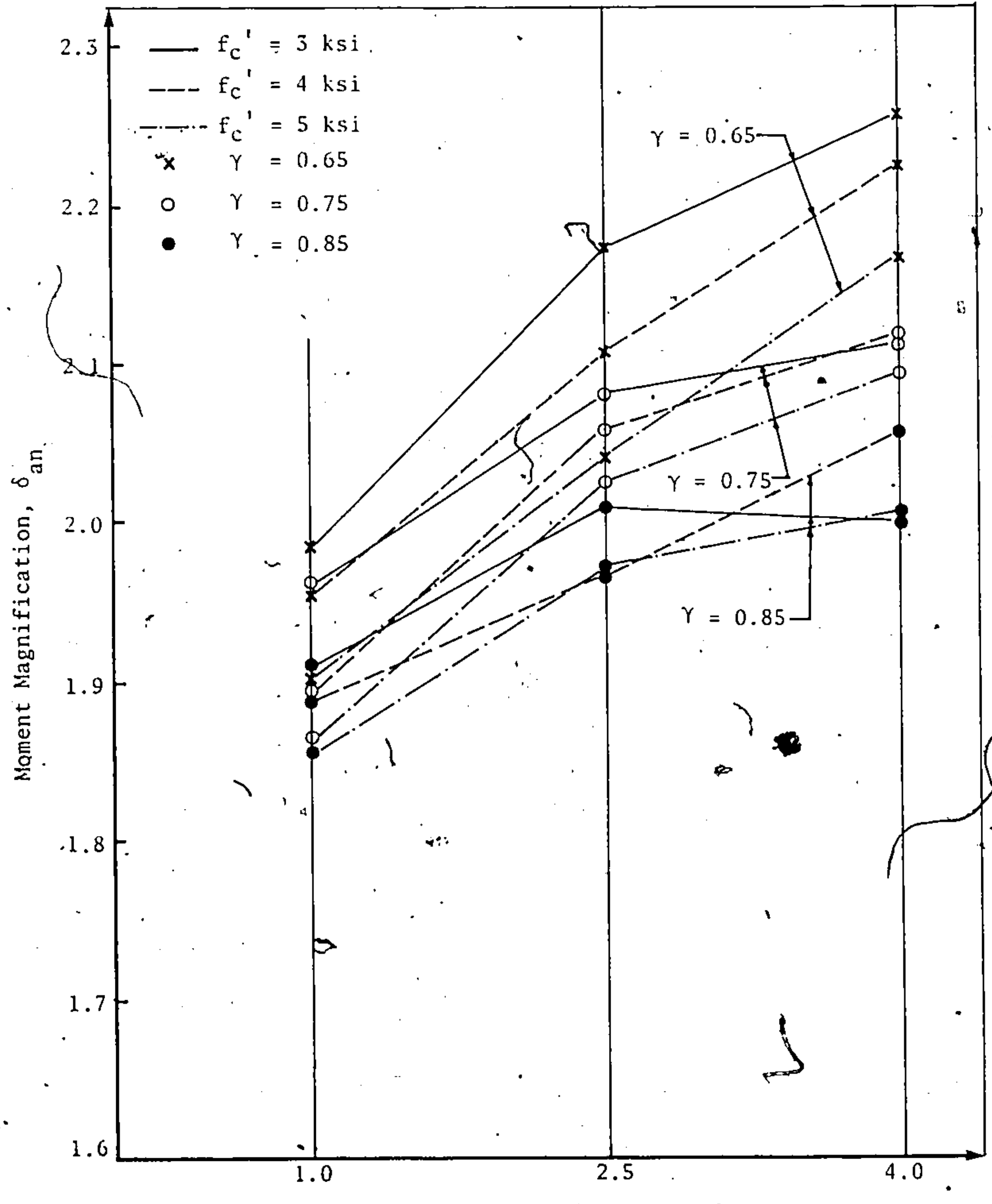

Fig. 5.4 EFFECT OF SECTION PROPERTIES ON δ_{an} FOR $f_y = 60$ ksi, $e/h = 0.5$, $L/h = 30$, $P_{sus}/P_{an} = 0$, $e_1/e_2 = 1.0$

2. Effect of f_y: The effect of f_y is quite pronounced with increased values generally resulting in increased δ_{an}. The amount of this increase is greatest for high values of ρ and low values of γ. Graphs similiar to Figs. 5.1 to 5.4 for $f_y = 50$ ksi indicated that the effect of f_y can be regarded as linear and the extremes of δ_{an} occur at the extremes of f_y.
3. Effect of γ: δ_{an} usually increases with decreasing values of γ. The effect, however, depends on the other properties and is greatest for high values of ρ and f_y. Again, the effect can be regarded as being linear.
4. Effect of ρ: The effect of ρ varies depending on the other properties. An increase in ρ increases δ_{an} for e/h equal to 0.5 but the effect at e/h equal to 0.1 depends on the value of γ. It is also seen that the effect is nonlinear and the intermediate value of ρ sometimes gives the highest value of δ_{an} for the same remaining properties.
5. Effect of e/h: The value of δ_{an} decreases as e/h increases. Increases in e/h also tend to decrease the inconsistency of the effect of section properties, but the general conclusions above are valid for both e/h values.
6. Maximum Values of δ_{an}: For a given f_y and e/h, the maximum value of δ_{an} occurs at high values of ρ and low values of γ. However, it may occur at either extreme of f_c' depending on f_y and e/h. The absolute maximum value for each e/h occurs at f_y equal to 60 ksi, γ equal to 0.65, ρ equal to 4.0% and f_c' equal to 3 ksi.

7. Minimum Values of δ_{an}: For a given f_y and e/h, the minimum value of δ_{an} occurs at high values of γ but at either extremes of ρ and f_c' depending on values of f_y and e/h. The absolute minimum for each e/h level occurs at f_y equal to 40 and γ equal to 0.85, but at either extremes of ρ and f_c' depending on e/h.

If the δ_{an}, for each e/h, is taken as the maximum occurring for all sections, conservative errors in δ_{an} range from 0 to +36% for e/h equal to 0.1 and from 0 to +36% for e/h equal to 0.5. Using this maximum value to estimate column capacities results in errors ranging from 0 to +45% for e/h = 0.1 and 0 to +42% of e/h = 0.5.

These errors can be reduced by using maximum values of δ_{an} for each f_y. This results in errors of column capacities of 0 to +15% at e/h = 0.1 and 0 to +21% at e/h = 0.5 for f_y = 40 ksi, and of 0 to +30% at e/h = 0.1 and 0 to +27% at e/h = 0.5 for f_y = 60 ksi.

As indicated in Figs. 5.1 to 5.4, little reduction in error can be achieved by also separating maximum values of δ_{an} on the basis of f_c' since this parameter has relatively little effect at maximum δ_{an} values and actually reverses its effect in some cases as is evident in Fig. 5.1.

As mentioned, a decrease in γ generally results in an increase in δ_{an}. The average error could be reduced by making the maximum values of δ_{an} dependent on γ. However, this would reduce the ease of use of the method since the area of steel and its position in the cross section are interrelated parameters. Furthermore, the maximum error cannot be significantly reduced by using the separate maximum values of δ_{an} for each γ. This can be realized by referring to Fig. 5.2 and noting that the minimum value of δ_{an} for γ equal to 5 ksi, does not differ significantly from the overall minimum value of δ_{an} for the same f_y and e/h.

It is worthwhile at this stage to note that a modified reduction method, dependent on both material properties of f_y and f_c', would give maximum errors of 42% in predicting column capacity for both values of e/h for the columns studied in Fig. 5.1 to 5.4. The ACI Reduction Factor Method gives errors between -28% and +35% for these columns. The ACI Moment Magnifier Method, on the other hand, gives errors for these columns of 0 to +47% for e/h equal to 0.1 and from -14% to 0 for e/h equal to 0.5. This results in an overall error range of 61%. These errors were calculated by the general expression

$$\text{Error} = \frac{P_{an} - P_m}{P_{an}} \times 100\% \qquad \ldots\ldots (5.3)$$

where P_m is the capacity predicted by the particular method excluding the capacity reduction factor, ϕ.

A broader study of the accuracy of the ACI Moment Magnifier Method is included in Chapter 6.

5.4 Section Properties of the Study Columns

The development of an empirical direct moment magnification method involves finding the maximum values of δ_{an} which occur in the range of the section properties for each loading condition. It is recognized from the previous section that maximum values of δ_{an} will occur for extreme section properties. A method which would be safe for these regions might be unduly conservative over the usual range of the variables. It was therefore decided to limit this study to the most commonly used ranges of the variables.

On this basis, columns were limited to sections with concrete strength, f_c', between 3 ksi and 5 ksi, with steel yield strengths between 40 ksi and 60 ksi, and with steel percentages between 1% and 4%. Columns were rectangular with two equal layers of steel with a separation distance ratio, γ, between 0.65 and 0.85. A discussion of the effect of these limits is included later in this chapter.

A recent study by Clark, as reported by Grant, Mirza, MacGregor(35), of columns in various buildings in Alberta indicated that specified steel percentages ranged from 0.5% to 5.5% and that more than a half had ratios between 0.5% and 1.5%. The lower value of this range is quite surprising since the value of 1% chosen for this study was based on the minimum allowed by the North American design codes(5,14). The maximum value of 4% was chosen as being a practical maximum since the design codes also limit the maximum ratio to 8% including steel at splices.

It has also been reported recently(35) that a study of columns in major cities throughout Canada indicated that specified concrete strengths usually ranged from 4 ksi to 6 ksi. This is somewhat higher than that estimated in choosing the range for this study. Fortunately, however, concrete strength does not significantly alter the moment magnification required as discussed later in this chapter.

In order to fully evaluate the proposed method, minimum values of δ_{an} are also required. Since the previous Section indicated that the effects of f_c', f_y, and γ on δ_{an} are essentially linear and that extreme values of δ_{an} occurred at extremes of these values, the maximum and minimum values of δ_{an} can be found by considering the extremes of these parameters. As is evident from Figs. 5.1 to 5.4 the effect of ρ is not linear and in some cases the intermediate value of ρ gave the highest δ_{an} for columns with similar properties. Therefore, it was thought desirable to include an intermediate value of ρ in the study. Because the maximum error in the column capacity does not always correspond to the maximum error in δ_{an}, and because a full range of sections was desirable for this study of the ACI Moment Magnifier Method (discussed in the next chapter), it was decided to study all combinations of the parameters.

The study columns, therefore, comprised of all combinations of the following

f_c' = 3 ksi, 5 ksi
f_y = 40 ksi, 60 ksi
γ = 0.65, 0.85
ρ = 1.0%, 2.5%, 4.0%

The resulting 24 columns are labelled in Table 5.2.

5.5 Loading Conditions for the Study Columns

The value of the moment magnification, δ_{an}, is affected by the loading conditions. For columns which are subjected to sustained loads with the same eccentricity as for the later short-term loading to failure, the important parameters are the slenderness ratio, L/h, the

TABLE 5.2 SECTION PROPERTIES OF THE COLUMNS STUDIED

Column Reference	f_y (ksi)	f_c' (ksi)	ρ (%)	γ
1	40	3	1.0	0.65
2	40	5	1.0	0.65
3	40	3	1.0	0.85
4	40	5	1.0	0.85
5	40	3	2.5	0.65
6	40	5	2.5	0.65
7	40	3	2.5	0.85
8	40	5	2.5	0.85
9	40	3	4.0	0.65
10	40	5	4.0	0.65
11	40	3	4.0	0.85
12	40	5	4.0	0.85
13	60	3	1.0	0.65
14	60	5	1.0	0.65
15	60	3	1.0	0.85
16	60	5	1.0	0.85
17	60	3	2.5	0.65
18	60	5	2.5	0.65
19	60	3	2.5	0.85
20	60	5	2.5	0.85
21	60	3	4.0	0.65
22	60	5	4.0	0.65
23	60	3	4.0	0.85
24	60	5	4.0	0.85

eccentricity ratio, e/h, the end moment ratio, e_1/e_2, and the sustained load ratio, P_{sus}/P_{an}. Failure to consider any of these parameters in the analysis would result in excessive errors. Therefore, it was necessary to find the practical number of cases for each parameter which need to be included in the design method to give accurate results.

Figure 5.5 shows the relationship between δ_{an} and e/h for short-term loading and symmetrical curvature for the column that indicated high values of δ_{an} in Section 5.3. Due to the nonlinearity of the curves, it was decided that the four values of e/h of 0.1, 0.25, 0.5 and 1.0 should be maintained throughout the study.

Figure 5.6 shows the same results from Fig. 5.5 but plotted against the slenderness ratio, L/h. Although values of δ_{an} increase greatly as L/h increases, the curvature of the curves is fairly uniform and three values of L/h (10, 20 and 30) adequately define these curves.

Figure 5.7 shows values of δ_{an} for different end moment ratios, e_1/e_2. Although some curvature of the relationship does exist at the extremes of e_1/e_2, the use of three values of e_1/e_2 (+1.0, 0, and -0.98) was considered satisfactory in maintaining accuracy. The choice of values of ~~the~~ sustained load ratio, P_{sus}/P_{an}, is complicated by the fact that, since P_{an} is not known beforehand, the values of P_{sus}/P_{an} cannot be fixed to some even value. Therefore, to find the maximum values of δ_{an} for the study range at some value of P_{sus}/P_{an}, interpolation of each δ_{an} - P_{sus}/P_{an} curve was required.

Figure 5.8 shows the relationship between δ_{an} and P_{sus}/P_{an} for e/h equal to 0.1 and a column having low steel properties for which

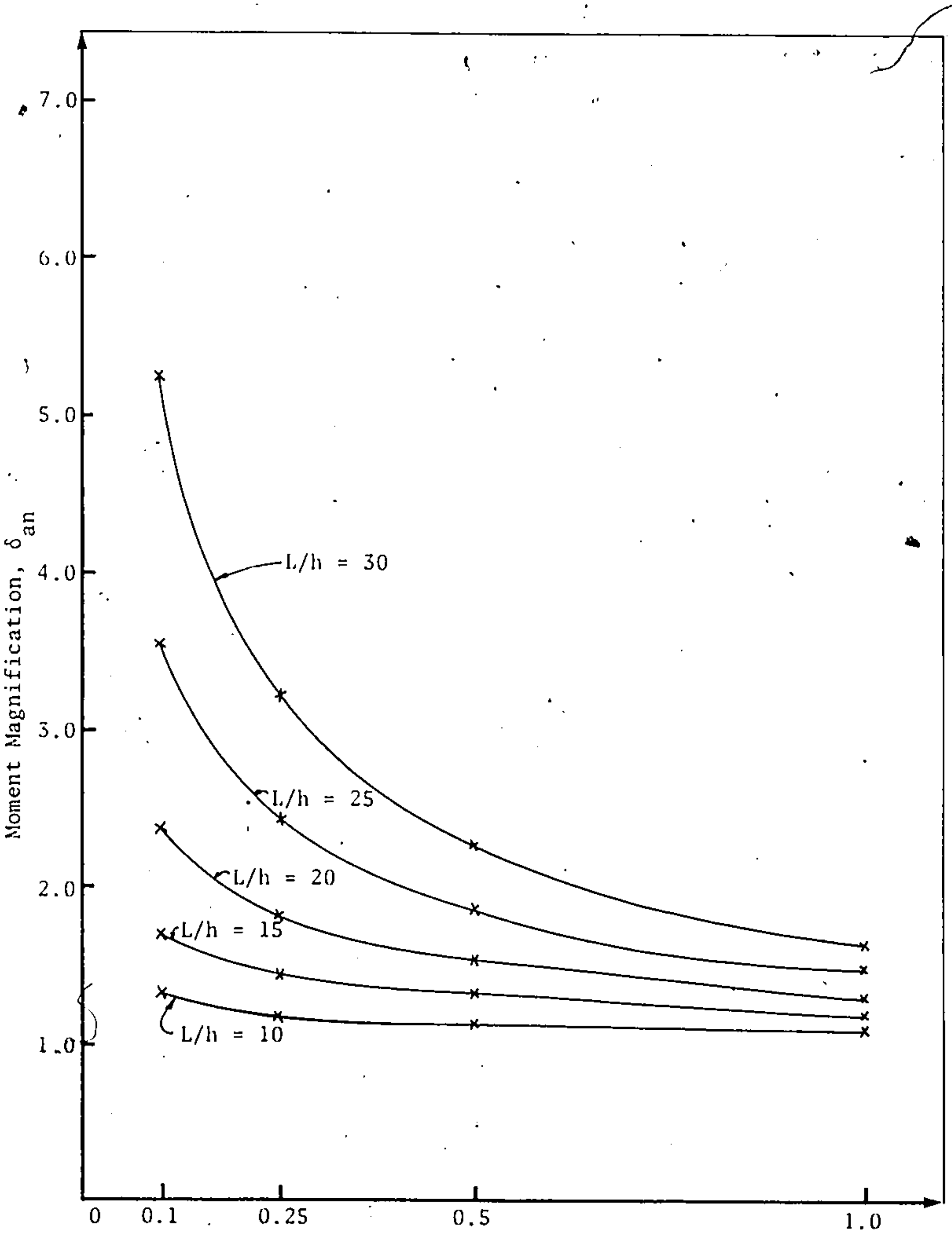

Fig. 5.5 EFFECT OF e/h ON δ_{an} FOR COLUMN "21" WITH P_{sus}/P_{an} = 0.0 AND e_1/e_2 = 1.0

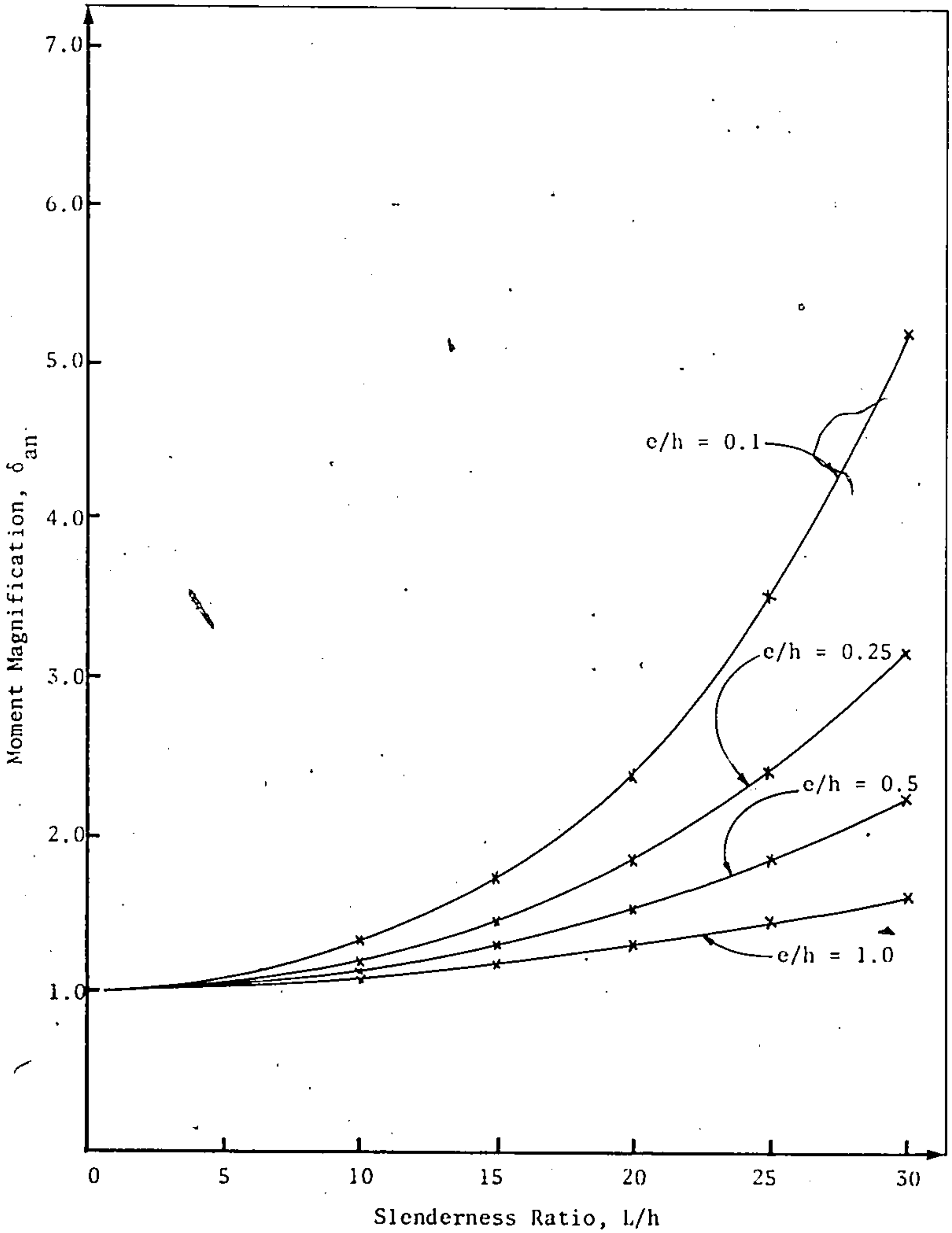

Fig. 5.6 EFFECT OF L/h ON δ_{an} FOR COLUMN "21" WITH P_{sus}/P_{an} = 0.0 AND e_1/e_2 = 1.0

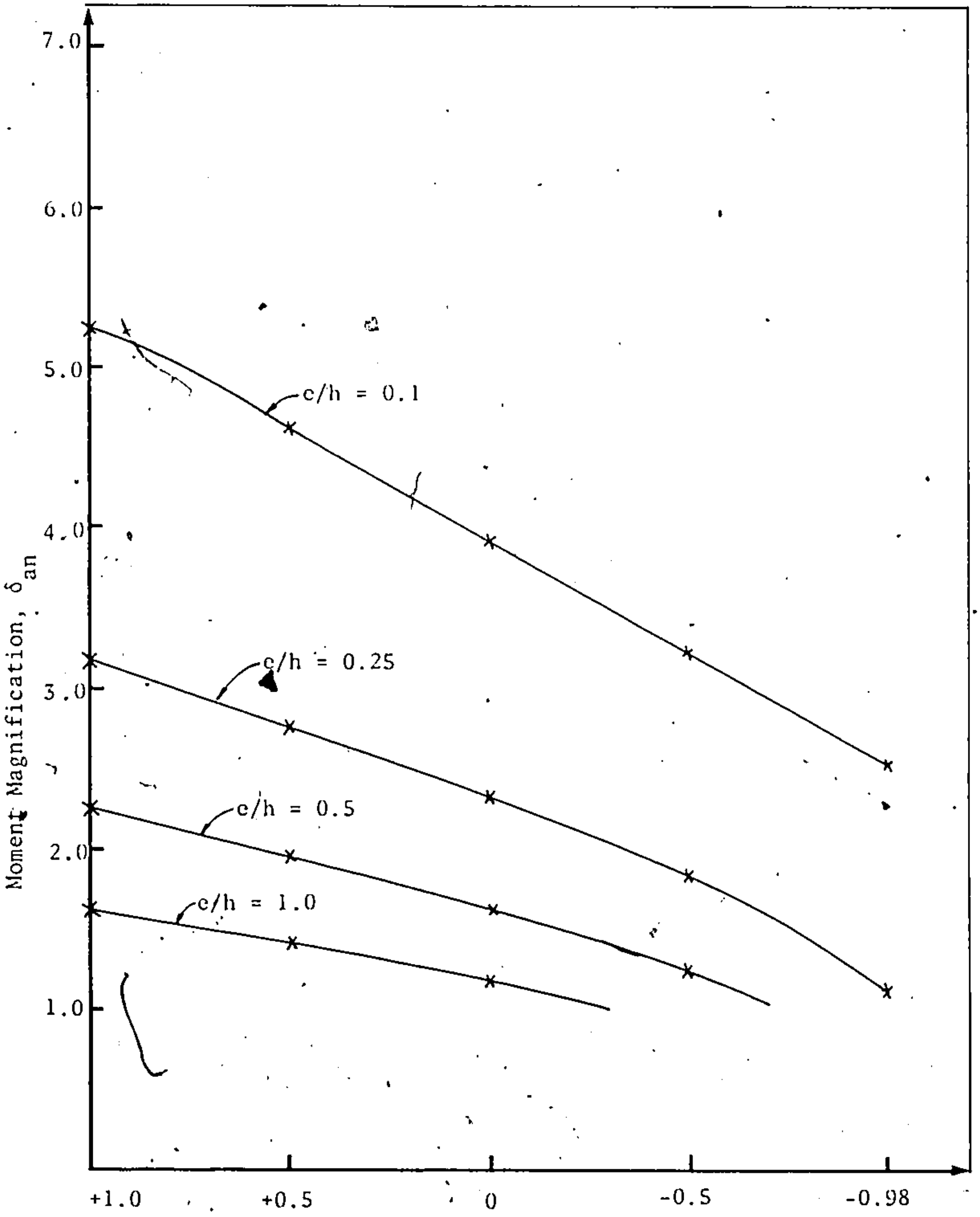

Fig. 5.7 EFFECT OF e_1/e_2 ON δ_{an} FOR COLUMN "21" WITH $L/h = 30$ AND $P_{sus}/P_{an} = 0.0$

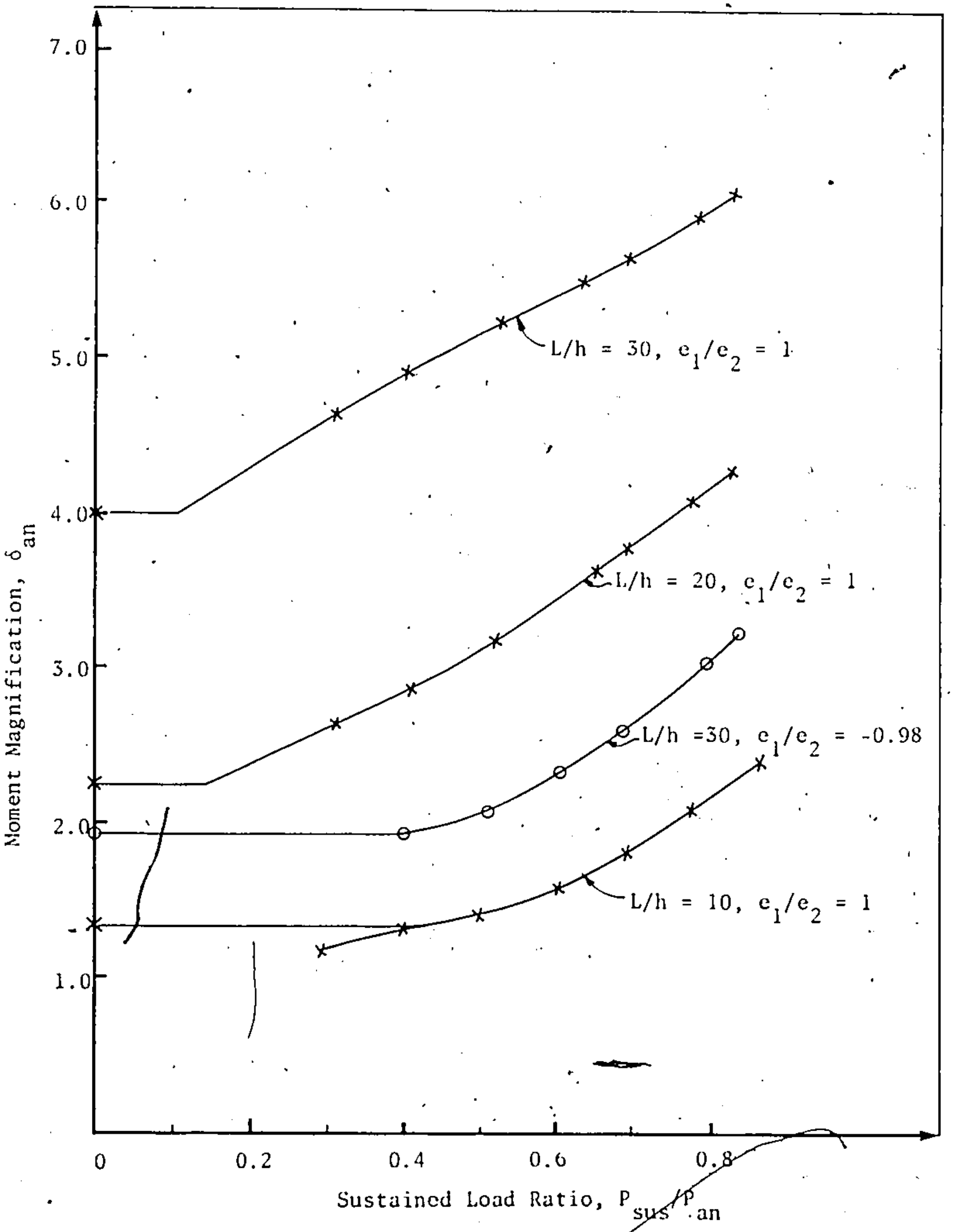

Fig. 5.8 EFFECT OF SUSTAINED LOAD RATIO ON δ_{an} FOR COLUMN "1" WITH e/h = 0.1

sustained load should be expected to have the greatest effect. It is seen that, for cases of low L/h or double curvature, low values of P_{sus}/P_{an} correspond to a beneficial effect on column capacity. This is due to the fact that the concrete strength was allowed to increase with age in the analytical model. It is seen that at low values of P_{sus}/P_{an}, this gain in concrete strength outweighed the weakening effect of creep as indicated by the horizontal portions of the relationships in Fig. 5.8. At these values, the column capacity and the δ_{an} value are taken to be those found for the short-term loading.

Since short columns can fail under sustained loads of 85% of the short-term capacity due to creep at high strains as reported by Viest, Elstner, Hognestad(82), it was thought that the value P_{sus}/P_{an} should be limited to 0.8. This is well above ratios of sustained load in most practical design cases. It was also thought that a lower limit of 0.2 would be justified. This limit has little effect since differences in column capacities are not significant between the levels $P_{sus}/P_{an} = 0$ and 0.2.

Because of the requirement of interpolation, about 6 levels of sustained load were studied. Values at P_{sus}/P_{an} equal to 0.2 were estimated by extropolation from the lower end of the δ_{an} - P_{sus}/P_{an} curve.

It should be noted that a straight line between δ_{an} at P_{sus}/P_{an} equals 0.2 and 0.8 adequately defines the curve in most cases and is conservative for cases of double curvature or low L/h. This point is used in developing an expression for δ_{an} in a later section of this chapter.

In summary, the loading conditions studied comprised of all combinations of the following

e/h = 0.1, 0.25, 0.5, 1.0
L/h = 10, 20, 30
e_1/e_2 = +1.0, 0, -0.98
P_{sus}/P_{an} = 0, five to seven values in the region of 0.3 to 0.8

As mentioned in Section 4.4, a value of e_1/e_2 equal to -0.98 is used to represent antisymmetric end moment cases in order to allow unwinding buckling to occur.

It should be noted that some of these combinations were eliminated if sustained load had no effect as occurred in some cases of double curvature and low values of L/h. This was accomplished by decreasing P_{sus}/P_{an} until a value was found which showed a column capacity higher than that for short-term loading.

5.6 Analytical Results of the Study Columns

The combination of the parameters of section properties and loading conditions creates quite a large number of results. Column capacities predicted by the analytical method, P_{an}, are listed in the tables of Appendix C. These tables also list the corresponding values of moment magnifications, δ_{an}. (P_{an} and δ_{an} are defined in Section 5.2)

These values of δ_{an} were interpolated to give corresponding values for P_{sus}/P_{an} equal to 0.2 to 0.8 in increments of 0.1. The maximum and minimum values of these δ_{an}, $\delta_{an\ max.}$ and $\delta_{an\ min.}$, for each loading condition and for f_y equal to 40 ksi and 60 ksi were found. Tables 5.3 and 5.4 list these values for the two extremes of P_{sus}/P_{an}. The columns for which these maximums and minimums occurred are also included in Tables 5.3 and 5.4.

It is evident, by comparing the values for f_y equal to 40 ksi with those for f_y equal to 60 ksi, that the separation of δ_{an} on the basis of f_y was justified, especially for high L/h values.

It is also apparent that maximum values generally occur for γ equal to 0.65 (columns 1, 2, 5, 6, 9, 10, 13, 14, 17, 18, 21, 22) and that low values occurred for γ equal to 0.85. This confirms the conclusion made in Section 5.3 but, again, it is pointed out that maximum error cannot be significantly reduced by separating $\delta_{an\ max.}$ on the basis of γ, since γ has little effect for columns with low ρ where section capacities are particularly sensitive to the value of δ_{an}. Therefore, the maximum error can only be reduced significantly by separating $\delta_{an\ max.}$ on the basis of both γ and ρ. This would result in a complex method either in terms of numerous graphs or a most difficult mathematical expression and would, of course, defeat the purpose of the method by necessitating iterations for the steel parameters.

It is also noted from Tables 5.3 and 5.4, that the effect of f_c' is inconsistent in that values of f_c' equal to 3 ksi (odd numbered columns) and f_c' equal to 5 ksi (even numbered columns) both coincide with maximum and minimum values of δ_{an}. A closer examination of the individual results indicated that the effect of f_c' on the moment magnification is not very significant.

TABLE 5.3 MAXIMUM AND MINIMUM VALUES OF δ_{an} FOR f_y = 40 ksi

		L/h	e/h = 0.1		e/h = 0.25		e/h = 0.5		e/h = 1.0	
			δ_{an}	Column	δ_{an}	Column	δ_{an}	Column	δ_{an}	Col.
P_{sus}/P_{an} = 0.2	Max.	10	1.35	5	1.22	1	1.15	2	1.13	2
		20	2.37	1	1.90	6	1.49	9	1.29	2
		30	4.46	6	2.88	9	1.92	9	1.52	2
e_1/e_2 = 1.0	Min.	10	1.32	11	1.17	11	1.11	8	1.06	11
		20	2.18	11	1.68	11	1.39	12	1.20	12
		30	3.74	11	2.40	4	1.69	4	1.36	4
P_{sus}/P_{an} = 0.8	Max.	10	2.14	1	1.54	1	1.27	5	1.18	2
		20	4.16	1	2.50	5	1.75	9	1.38	2
		30	6.63	5	3.48	9	2.27	9	1.64	2
e_1/e_2 = 1.0	Min.	10	1.67	12	1.24	12	1.16	11	1.09	4
		20	3.49	12	2.09	4	1.52	4	1.22	4
		30	5.08	4	2.73	4	1.86	4	1.42	4
P_{sus}/P_{an} = 0.2	Max.	10	—	—	—	—	—	—	—	—
		20	1.67	4	1.23	1	1.05	2	—	—
		30	3.03	3	2.18	5	1.42	10	1.17	2
e_1/e_2 = 0.0	Min.	10	—	—	—	—	—	—	—	—
		20	1.52	11	1.12	11	—	—	—	—
		30	2.68	11	1.78	11	1.24	4	1.03	4
P_{sus}/P_{an} = 0.8	Max.	10	1.51	1	1.06	1	—	—	—	—
		20	3.33	3	1.84	5	1.30	5	1.04	2
		30	5.69	5	2.83	5	1.78	9	1.21	9
e_1/e_2 = 0.0	Min.	10	—	—	—	—	—	—	—	—
		20	2.76	12	1.57	12	1.14	4	—	—
		30	4.25	2	2.21	4	1.41	4	1.06	4
P_{sus}/P_{an} = 0.2	Max.	10	—	—	—	—	—	—	—	—
		20	1.03	1	—	—	—	—	—	—
		30	1.96	2	1.06	1,4	—	—	—	—
e_1/e_2 = -0.98	Min.	10	—	—	—	—	—	—	—	—
		20	—	—	—	—	—	—	—	—
		30	1.56	11	—	—	—	—	—	—
P_{sus}/P_{an} = 0.8	Max.	10	—	—	—	—	—	—	—	—
		20	1.80	5	1.11	1	—	—	—	—
		30	3.32	7	1.73	5	1.16	5	—	—
e_1/e_2 = -0.98	Min.	10	—	—	—	—	—	—	—	—
		20	1.45	4	—	—	—	—	—	—
		30	2.61	2	1.36	6	1.03	12	—	—

— indicates that column capacity is not affected by slenderness.

TABLE 5.4 MAXIMUM AND MINIMUM VALUES OF δ_{an} FOR f_y = 60 ksi

		L/h	c/h = 0.1		c/h = 0.25		c/h = 0.5		c/h = 1.0	
			δ_{an}	Column	δ_{an}	Column	δ_{an}	Column	δ_{an}	Col.
P_{sus}/P_{an} = 0.2 c_1/c_2 = 1.0	Max.	10	1.34	14	1.22	14	1.16	14	1.10	13
		20	2.43	13	2.07	13	1.59	17	1.31	21
		30	5.35	17	3.32	17	2.26	21	1.64	21
	Min.	10	1.26	23	1.16	23	1.12	23	1.07	24
		20	2.10	23	1.66	23	1.44	23	1.23	16
		30	3.91	23	2.65	23	1.91	16	1.47	16
P_{sus}/P_{an} = 0.8 c_1/c_2 = 1.0	Max.	10	2.06	13	1.47	15	1.27	13	1.15	21
		20	4.14	13	2.47	17	1.84	17	1.43	21
		30	7.45	17	3.88	17	2.57	21	1.77	21
	Min.	10	1.66	24	1.25	24	1.12	23	1.10	16
		20	3.38	24	2.16	23	1.60	16	1.29	16
		30	5.52	16	3.06	16	2.07	16	1.53	16
P_{sus}/P_{an} = 0.2 c_1/c_2 = 0.0	Max.	10	—	—	—	—	—	—	—	—
		20	1.71	14	1.23	13	1.09	18	—	—
		30	3.92	21	2.50	18	1.69	22	1.19	21
	Min.	10	—	—	—	—	—	—	—	—
		20	1.42	23	1.12	23	1.01	23	—	—
		30	2.98	23	1.80	23	1.38	23	1.07	16
P_{sus}/P_{an} = 0.8 c_1/c_2 = 0.0	Max.	10	1.49	15	1.08	13	—	—	—	—
		20	3.15	13	1.91	13	1.31	17	1.05	17
		30	6.04	17	3.25	17	1.96	21	1.35	21
	Min.	10	1.16	24	—	—	—	—	—	—
		20	2.60	24	1.55	24	1.14	24	—	—
		30	4.54	24	2.44	16	1.58	16	1.13	16
P_{sus}/P_{an} = 0.2 c_1/c_2 = -0.98	Max.	10	—	—	—	—	—	—	—	—
		20	1.01	14	—	—	—	—	—	—
		30	2.05	21	1.15	21	—	—	—	—
	Min.	10	—	—	—	—	—	—	—	—
		20	—	—	—	—	—	—	—	—
		30	1.91	23	1.01	23	—	—	—	—
P_{sus}/P_{an} = 0.8 c_1/c_2 = -0.98	Max.	10	1.03	13	—	—	—	—	—	—
		20	1.75	15	1.09	13	—	—	—	—
		30	3.02	15	1.66	13	1.17	13	—	—
	Min.	10	—	—	—	—	—	—	—	—
		20	1.40	24	—	—	—	—	—	—
		30	2.57	14	1.41	24	—	—	—	—

— indicates that column capacity is not affected by slenderness.

As seen from Tables 5.3 and 5.4, the effect of ρ is quite variable in that the maximum and minimum values occur at all values of ρ.

5.7 A Direct Moment Magnification Method Using Graphs

A method to account for slenderness, which does not require prior knowledge of the steel parameters (area and position), can now be presented in the form of 24 graphs as included in Appendix D. These graphs show the range of δ_{an} versus e/h with L/h as contours. Each graph is for a certain value of e_1/e_2 and P_{sus}/P_{an} and are separated on the basis of f_y. Using the maximum values of δ_{an}, $\delta_{an\ max.}$ in conjunction with an interaction diagram, will give conservative results.

As already pointed out, the relationship between δ_{an} and L/h is nonlinear with concave curvature increasing as the L/h increases. Therefore, a linear interpolation between the L/h contours is conservative. The additional error created by this linear interpolation is highest for L/h in the region of 25 and for e/h of 0.1 as was indicated in Fig. 5.6. For this case, it amounts to a 6% conservative error in estimating δ_{an} which, for this level of δ_{an} X e/h, results in about a further 5% conservative error in estimating column capacity and is therefore quite acceptable.

Some loss of accuracy occurs in plotting the curves through the values of $\delta_{an\ max.}$ at the four different values of e/h. A value of $\pm$ 2% error in $\delta_{an\ max.}$ is a good estimate of this error and therefore can be regarded as negligible.

The graphs shown are for values of e_1/e_2 of +1.0, 0.0, and -0.98, and for values of P_{sus}/P_{an} of 0.2, 0.4, 0.6, and 0.8. As shown in Figs. 5.7 and 5.8, linear interpolation between these graphs for other values of e_1/e_2 and P_{sus}/P_{an} will introduce only very small errors.

It may also be noted, that using the graph for the next highest value of P_{sus}/P_{an} for an intermediate value of P_{sus}/P_{an} results in a maximum conservative error of approximately +20%. Alternatively, should the graph for the nearest value of P_{sus}/P_{an} be used, maximum errors are in the range of ± 10%. Since essentially no errors on the unsafe have been included in the graphs up to this point, this unsafe error may be deemed to be acceptable. (It should be remembered that the $\delta_{an\ max.}$ values are the maximums found for all columns corresponding to conditions specified in each graph.)

The proposed graphical method, therefore, takes the form of reading the value of e/h and L/h from the graphs for the nearest P_{sus}/P_{an} for the two values of e_1/e_2 which bound the given value. A simple interpolation of these two values gives an acceptable and usually conservative value of moment magnification.

5.8 Accuracy of the Proposed Direct Moment Magnification Method

Although some loss in accuracy can be expected and should be acceptable for methods which are easier to use, the ultimate evaluation of a method must be based on its accuracy. For this purpose, column capacities predicted by the proposed method must be compared with column capacities predicted by the analytical method.

A realistic assessment of the usefulness of the proposed method can be made by comparing its accuracy with that of the ACI Moment Magnifier Method. Although this method is studied in the next chapter, its accuracy is included in this section for comparison purposes.

The tables in Appendix E give predicted column capacities representative of the proposed method. These capacities were predicted by using the maximum value of δ_{an} for each specific loading condition and steel yield stress. These maximum values, $\delta_{an\ max.}$, are the values which were used to define the upper limit of each range of δ_{an} in the graphs given in Appendix D. Since it is recommended that only the upper limits are to be used when estimating the moment magnification from the graphs, the values in the tables in Appendix E are typical of the proposed method. As is recommended in the proposed method, the values of $\delta_{an\ max.}$ for any value of P_{sus}/P_{an} were taken as the value for the nearest value of P_{sus}/P_{an} equal to 0.2, 0.4, 0.6, and 0.8. In order to simulate practical design, the capacities predicted by the method were estimated by using the ACI Rectangular Stress Block Method to find section capacity. The capacities represent ultimate values and the capacity reduction factor, ϕ, has not been included.

The errors associated with these predicted capacities are also listed in the tables of Appendix E. These were estimated by

$$\text{Error} = \frac{P_{an} - P_{gr}}{P_{an}} \quad \ldots. \ (5.4)$$

where P_{gr} is the capacity predicted by this direct method.

It is noted that a negative error implies an error on the unsafe side, whereas a positive error implies a conservative error.

It may be noted that the capacities are only predicted for columns with the loading conditions specified in Section 5.5. It should be remembered that the values of $\delta_{an\ max.}$ for these conditions are the values which were used to define the upper limits of each range of the moment magnifications shown in the graphs in Appendix D. For convenience, these values of $\delta_{an\ max.}$ rather than values actually read from the graphs were used in finding the predicted capacities given in the tables in Appendix E. Therefore, the errors given in these tables do not include the slight inaccuracies which would result from the drawing and reading of the graphs. These errors are considered to be insignificant.

It is also noted that inaccuracies which would occur due to the interpolation for intermediate values of L/h, e/h, and e_1/e_2, are not included in this accuracy study. As mentioned in Section 5.7, these errors are quite small and may be ignored. The larger errors (±10%) incurred by using only four values of P_{sus}/P_{an} are included.

Table 5.5 gives the maximum errors for each column for all the loading cases studied. Negative errors are due to two reasons. A comparison of section interaction diagrams predicted by the analytical method with those resulting from the use of the ACI Rectangular Stress Block Method indicated that the latter gave capacities 5% higher in cases where compression controlled. This is due to the fact that the simulation of the concrete stress - strain relationship by the rectangular stress block of the ACI method overestimates the contribution of the concrete to section capacity when compared to the results using the concrete stress - strain relationship assumed in the

TABLE 5.5 MAXIMUM ERRORS FOR THE PROPOSED METHOD AND FOR THE ACI MOMENT MAGNIFIER METHOD

Column Reference	Proposed Direct Moment Magnification Method		ACI Moment Magnifier Method		
	Maximum Negative Error	Maximum Positive Error	Maximum Negative Error	Maximum Positive Error	Maximum Positive Error (excluding e_1/e_2 = -0.98)
1	- 14	+ 23	- 18	+ 67	+ 49
2	- 5	+ 46	- 25	+ 76	+ 63
3	- 12	+ 27	- 18	+ 59	+ 41
4	- 5	+ 42	- 14	+ 71	+ 57
5	- 13	+ 9	- 18	+ 57	+ 38
6	- 8	+ 21	- 8	+ 68	+ 52
7	- 8	+ 13	- 19	+ 42	+ 25
8	- 5	+ 23	- 9	+ 58	+ 42
9	- 6	+ 10	- 16	+ 51	+ 32
10	- 5	+ 13	- 9	+ 63	+ 45
11	- 7	+ 12	- 18	+ 33	+ 17
12	- 4	+ 17	- 10	+ 49	+ 32
13	- 14	+ 21	- 16	+ 69	+ 51
14	- 5	+ 42	- 19	+ 71	+ 63
15	- 7	+ 22	- 16	+ 63	+ 46
16	- 5	+ 42	- 14	+ 73	+ 60
17	- 8	+ 10	- 13	+ 63	+ 40
18	- 5	+ 16	- 7	+ 71	+ 54
19	- 4	+ 15	- 14	+ 52	+ 35
20	- 4	+ 21	- 7	+ 63	+ 48
21	- 6	+ 9	- 11	+ 59	+ 38
22	- 3	+ 12	- 5	+ 68	+ 48
23	- 3	+ 19	- 12	+ 47	+ 31
24	- 3	+ 19	- 7	+ 57	+ 42

analytical method. Negative errors are also caused by the use of a value of $\delta_{an\ max.}$ corresponding to a lower value of P_{sus}/P_{an}.

It is noted from Table 5.5 that the four maximum negative errors greater than -10% occur for columns with f_c' equal to 3 ksi, and that the maximum negative errors are generally less for columns with f_c' equal to 5 ksi. It is also noted that the maximum negative error decreases as the steel percentage and the distance between the two layers of steel increases.

The maximum positive errors range from 9% to 46%. Generally, the higher values occur for columns with f_c' equal to 5 ksi and with low steel percentages. Because the range of δ_{an} values broadens as slenderness increases, as indicated in the graphs of Appendix D, these maximum values generally occur at high slenderness and accuracy is better for lower slenderness ratios.

Figures 5.9 and 5.10 show the distribution of the errors found from the tables of Appendix E. They include the errors for all the loading conditions with P_{sus}/P_{an} in the region of 0.3, 0.5, and 0.7. The range of errors can be expected to be greater for these values of P_{sus}/P_{an} due to the use of $\delta_{an\ max.}$ at P_{sus}/P_{an} equal to 0.2, 0.4, 0.6, and 0.8. For these conditions, approximately 82% of the predicted capacities are within ±10% of those predicted by the analytical method. Approximately 5% are more conservative than 20%.

Table 5.5 also shows the ranges of error for each column for the same loading conditions resulting from a comparative analysis of the ACI Moment Magnifier Method. Errors are calculated from

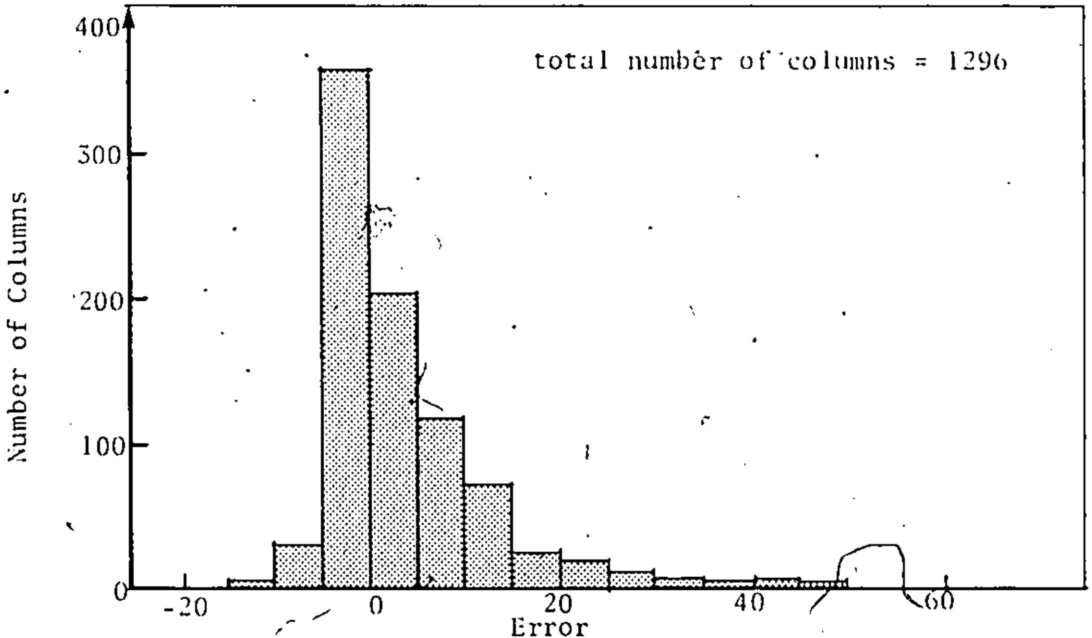

Fig. 5.9 DISTRIBUTION OF ERRORS USING THE PROPOSED METHOD FOR COLUMNS WITH f_y = 40 ksi

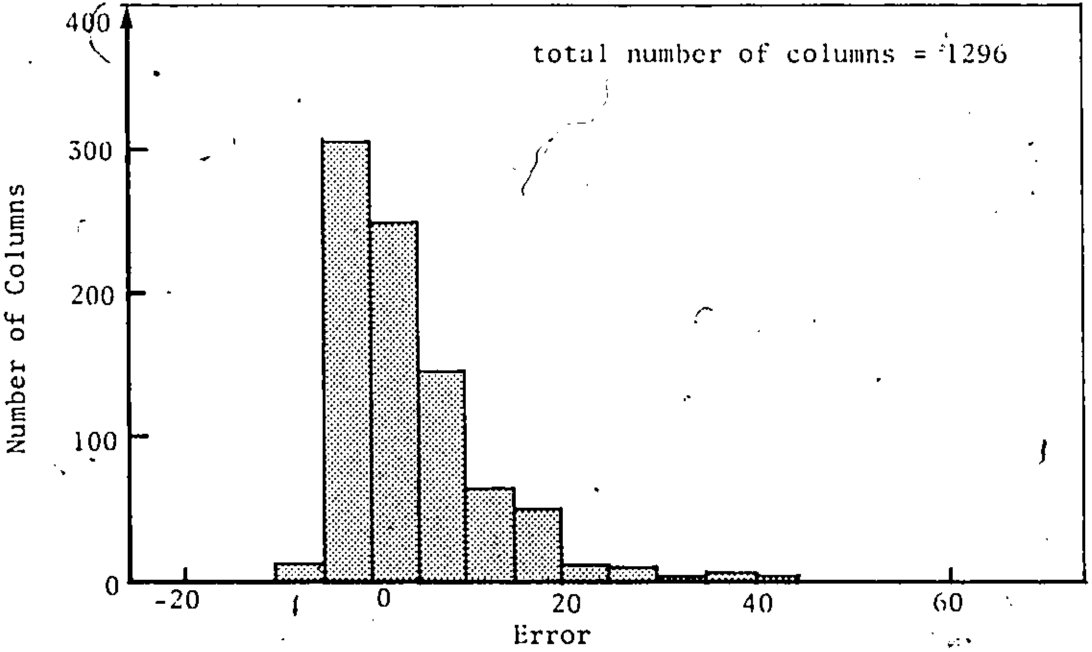

Fig. 5.10 DISTRIBUTION OF ERRORS USING THE PROPOSED METHOD FOR COLUMNS WITH f_y = 60 ksi

$$\text{Error} = \frac{P_{an} - P_{aci}}{P_{an}} \qquad \ldots. \ (5.5)$$

where P_{aci} is the ultimate capacity predicted in the ACI Moment Magnifier Method using the more accurate expression of EI (Eqn. 6.6) and does not include the capacity reduction factor, ∅.

By comparing the ranges of error with those of the proposed method, it is evident that the proposed method gives a narrower range of errors for each column. As is noted in the next chapter, the ACI Moment Magnifier Method may be considered to be unduly restricted for cases with end eccentricity ratios less than -0.5 and accuracy improves if these cases are eliminated from the study. The maximum errors remaining after values for double curvature have been eliminated are also listed in Table 5.5. It is evident, even after this modification, that the proposed method gives better overall results.

A further comparison can be made by comparing the histograms in Fig. 5.9 and 5.10 with comparative ones for the ACI Moment Magnifier Method, as shown in Figs. 5.11 and 5.12. For this method, including the results of e_1/e_2 equal to -0.98, approximately 62% of the errors were within ±10% and approximately 25% were conservative by more than 20%. A comparison between these values and those for the proposed method indicates that overall accuracy is better for the proposed method. This statement remains valid even if cases of double curvature are not included.

The validity of comparing both methods on the basis of the unweighted overall results may be questioned. In practice, slender columns are much more frequently loaded at low eccentricities. In an

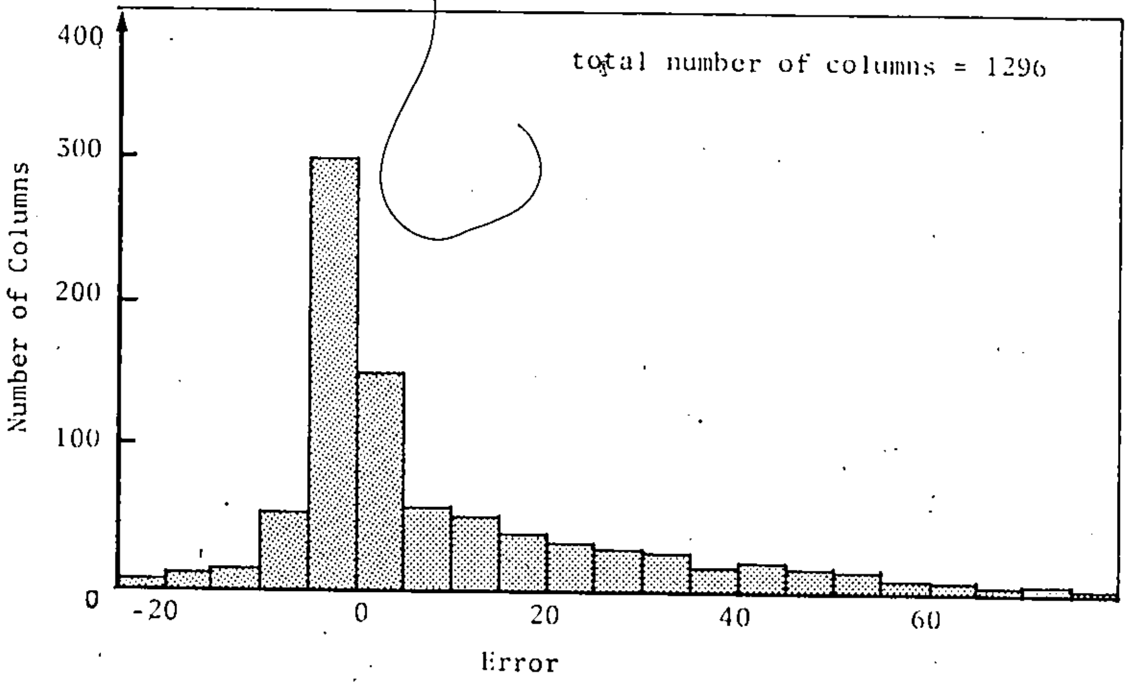

Fig. 5.11 DISTRIBUTION OF ERRORS USING THE ACI MOMENT MAGNIFICATION METHOD FOR COLUMNS WITH f_y = 40 ksi

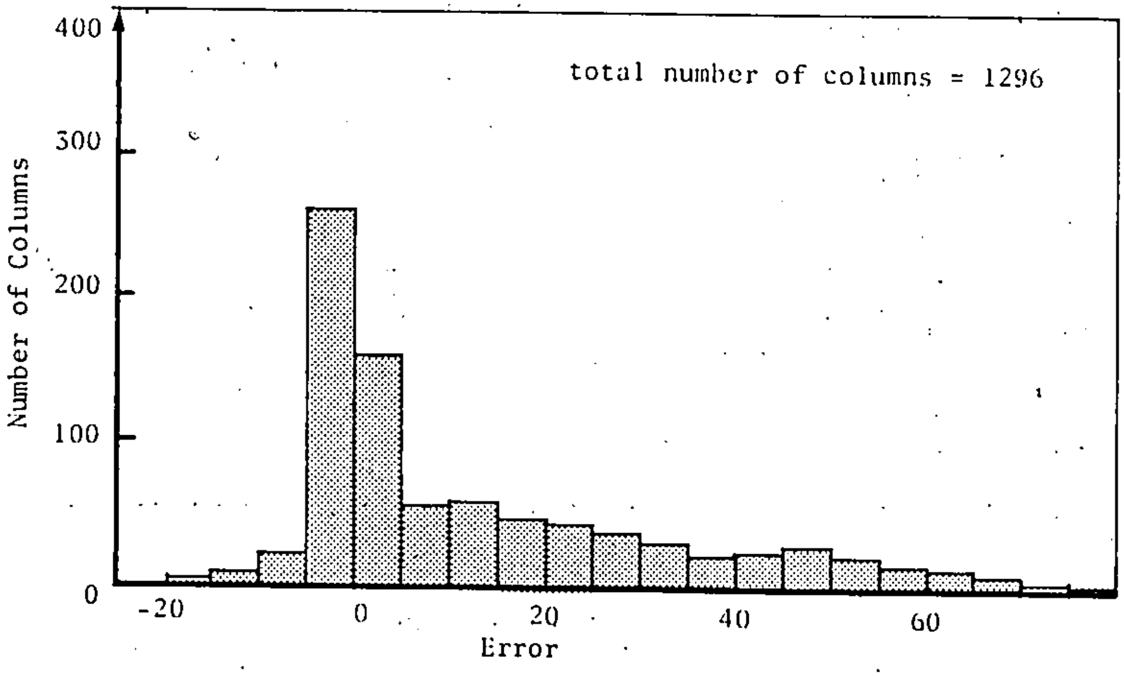

Fig. 5.12 DISTRIBUTION OF ERRORS USING THE ACI MOMENT MAGNIFICATION METHOD FOR COLUMNS WITH f_y = 60 ksi

TABLE 5.6 ACCURACY OF THE PROPOSED METHOD AND OF THE ACI MOMENT MAGNIFIER METHOD FOR SELECTED LOADING CASES

	Loading Conditions				Column Reference											
	L/h	e/h	e_1/e_2	P_{sus}/P_{an}	13	14	15	16	17	18	19	20	21	22	23	24
Errors Using Proposed Method (%)	10	0.1	1.0	0.5	-1	-5	-4	0	-5	-4	-3	1	1	1	1	2
	10	0.25	1.0	0.5	-3	0	0	-3	-4	-3	1	-1	0	1	2	-1
	10	0.5	1.0	0.5	2	3	3	3	-1	1	0	0	0	1	1	1
	10	0.1	0.0	0.5	-5	-5	-5	-5	-3	-4	-3	-3	-2	-3	-2	-3
	10	0.25	0.0	0.5	-5	-5	-5	-5	-4	-4	-4	-4	-3	-3	-3	-3
	10	0.5	0.0	0.5	-1	-1	-3	-2	-4	-2	-4	-2	-4	-2	-3	-2
	20	0.1	1.0	0.5	-8	0	3	1	-8	-5	-2	-1	2	4	3	8
	20	0.25	1.0	0.5	4	12	6	10	-1	0	4	-4	5	5	9	9
	20	0.1	0.0	0.5	2	8	-7	-4	2	6	-4	-3	5	6	-1	-2
	20	0.25	0.0	0.5	-10	9	-4	0	-5	-3	1	2	6	-1	3	3
	30	0.1	1.0	0.5	3	39	10	27	-5	-3	9	10	5	-1	16	15
	30	0.1	0.0	0.5	12	31	13	27	3	2	14	17	4	8	18	17
Errors Using ACI Moment Magnifier Method (%)	10	0.1	1.0	0.5	2	9	-1	4	-1	4	-3	-1	-2	2	-4	-2
	10	0.25	1.0	0.5	1	8	0	6	0	5	-2	2	-1	3	-2	0
	10	0.5	1.0	0.5	-2	-2	-1	-1	0	3	-2	0	-1	2	-2	0
	10	0.1	0.0	0.5	-3	3	-5	-2	-3	-1	-3	-3	-2	-3	-2	-3
	10	0.25	0.0	0.5	-5	-5	-5	-5	-4	-4	-4	-4	-3	-3	-3	-3
	10	0.5	0.0	0.5	-1	-1	-3	-2	-4	-2	-4	-2	-4	-2	-3	-2
	20	0.1	1.0	0.5	-25	43	18	35	17	31	6	20	13	25	2	12
	20	0.25	1.0	0.5	8	21	8	20	7	16	2	11	7	14	1	7
	20	0.1	0.0	0.5	35	51	25	45	25	40	10	26	20	33	4	16
	20	0.25	0.0	0.5	21	38	16	33	15	28	8	19	13	23	4	12
	30	0.1	1.0	0.5	32	51	34	49	28	40	26	38	29	34	23	32
	30	0.1	0.0	0.5	50	64	46	60	40	55	35	48	37	48	31	41

attempt to compare both methods over a more realistic range of the loading parameters, twelve loading cases were studied as indicated in Table 5.6. These cases, to some extent, account for the more frequent occurrence of columns with low slenderness and the potential for greater eccentricity at these levels of slenderness. It is recognized that most columns in frames are loaded in double curvature. However, the single curvature case is important since slender columns will often be controlled by minimum eccentricity. Since the ACI Moment Magnifier Method may be considered to be quite conservative for e_1/e_2 equal to -0.98, only cases with e_1/e_2 equal to 1.0 and 0.0 are included. The parameter P_{sus}/P_{an} is taken as 0.5 as being fairly representative of practical loading conditions and in order to include the errors resulting from using the values of $\delta_{an\ max.}$ for the nearest P_{sus}/P_{an} value.

As can be seen from Table 5.6, both methods are fairly accurate at L/h equal to 10. With very few exceptions, the proposed method is more accurate than the ACI Moment Magnifier Method for L/h equal to 20 and 30.

The comparison can be carried further by recognizing that most columns in practice have steel percentages in the region of 1% and have a concrete strength in the region of 5 ksi(35). Therefore, emphasis should be placed on Columns 14 and 16. For these columns under the loading conditions of Table 5.6, the accuracy of the proposed method is significantly better than that of the ACI Moment Magnifier Method.

A further comparison between the errors associated with both methods, by referring to the tables in Appendix E and F, indicates that the proposed method is more accurate than the ACI Moment Magnifier Method for Columns 14 and 16 over the broader range of loading conditions. For these columns over the entire range of loading conditions studied, approximately 67% of the errors associated with the proposed method were within +10% and approximately 14% were more conservative than 20%. Approximately 51% of the errors for the ACI Moment Magnifier Method were within +10% and approximately 35% were conservative by more than 20%.

5.9 An Expression for a Direct Moment Magnification Method

Although the graphical solution previously discussed is favoured for design purposes, it was thought that a mathematical expression representing [illegible] relationships for the graphs in Appendix D would be of interest. The use of such an expression increases conservative errors but is of some significance in further indicating the effect of the parameters in the graphs. The development of this expression required much trial and error and this section briefly describes the development of the expression which gave best results in fitting the values of $\delta_{an\ max.}$ in the graphs of Appendix D.

Since it was a natural decision that only very small errors on the unsafe side would be acceptable using this expression, the maximum error on the unsafe side was limited to 6%. It was recognized that errors on the conservative side could and would be greater than this.

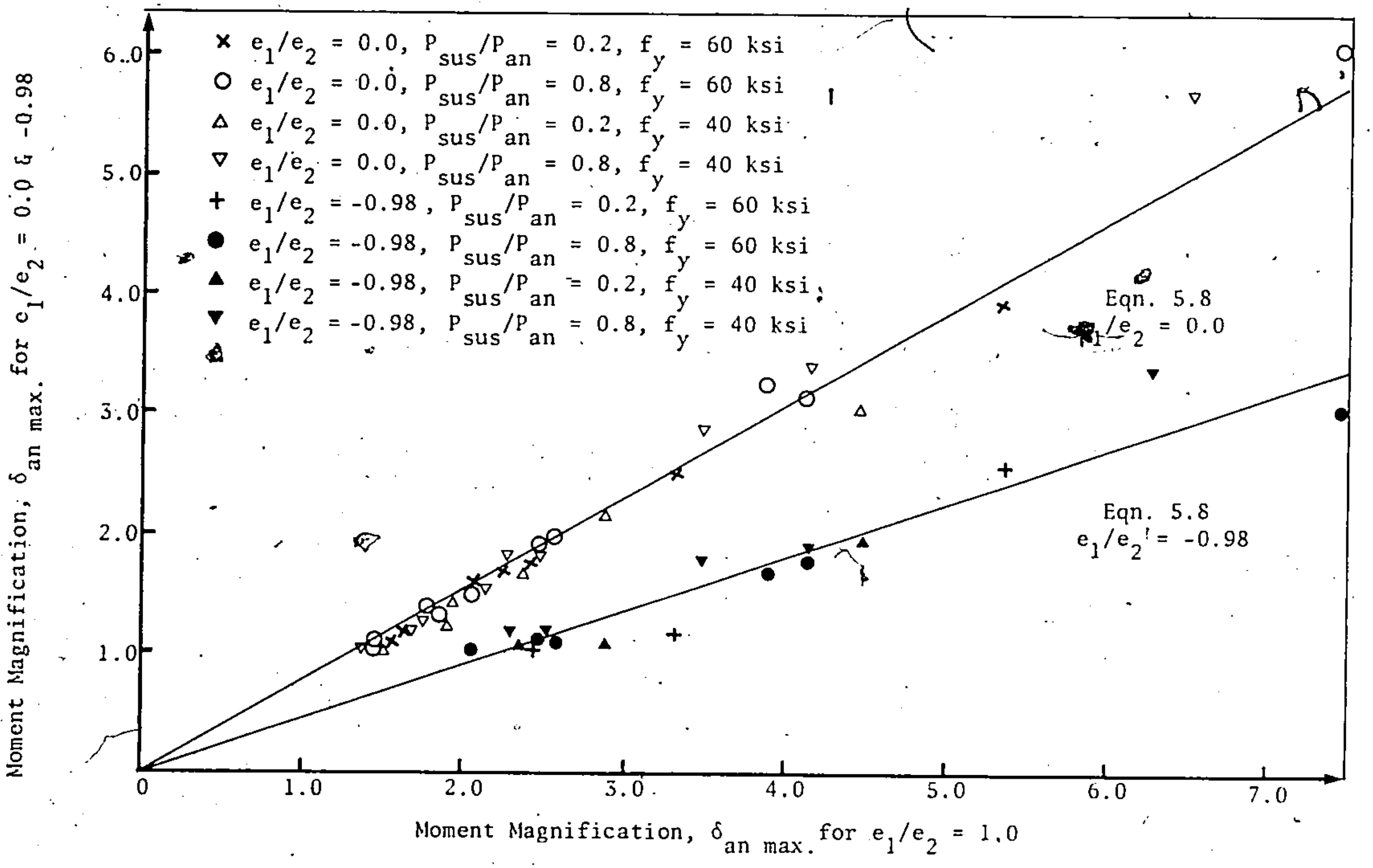

Fig. 5.13 RELATIONSHIP BETWEEN $\delta_{an\ max.}$ FOR $e_1/e_2 = 0.0$ & -0.98 AND $\delta_{an\ max.}$ FOR $e_1/e_2 = 1.0$

A comparison of the values of $\delta_{an\ max.}$ for $f_y = 40$ ksi and 60 ksi over the range of the parameters studied showed that on the average

$$\delta_{an\ max.\ (f_y = 40)} = C \times \delta_{an\ max.\ (f_y = 60)} \qquad \ldots.\ (5.6)$$

where C = 1.009 for L/h = 10

0.987 for L/h = 20

0.908 for L/h = 30

This relationship can be expressed by

$$C = 1 - 0.01\ (\frac{L}{10h})^2$$

Since the effect of f_y on δ_{an} is approximately linear, the general expression for $\delta_{an\ max.}$ in terms of $\delta_{an\ max.\ (f_y = 60)}$ can be expressed as

$$\delta_{an\ max.} = \delta_{an\ max.(f_y = 60)}\ \{1 - 0.01 \times (\frac{60 - f_y}{20})(\frac{L}{10h})^2\} \qquad \ldots.\ (5.7)$$

Figure 5.13 is a graph of values of $\delta_{an\ max.}$ for e_1/e_2 equal to 0.0 and -0.98 versus values of $\delta_{an\ max.}$ for e_1/e_2 equal to 1.0 for the columns with P_{sus}/P_{an} equal to 0.2 and 0.8. The average relationship indicated in Fig. 5.13 can be represented by

$$\delta_{an\ max.} = \delta_{an\ max.(e_1/e_2 = 1.0)} \times \{1 - 0.233(1 - e_1/e_2)^{1.26}\} \qquad \ldots.\ (5.8)$$

This indicates that on the average, the effect of e_1/e_2 is slightly nonlinear. This might suggest that linear interpolation of the graphs for intermediate values of e_1/e_2 is not correct. However, the nonlinearity of e_1/e_2 indicated by Eqn. 5.8 is quite small. The values of $\delta_{an\ max.}$ for e_1/e_2 equal to 0.5 or -0.5 obtained by using Eqn. 5.8 are only approximately 2% higher than the corresponding values which would be obtained by interpolation of the values of $\delta_{an\ max.}$ for e_1/e_2 equal to 1.0, 0.0, and -0.98 obtained by using Eqn. 5.8.

It is noted that Eqns. 5.7 and 5.8 are expressions representing the average effect of the parameters f_y and e_1/e_2 respectively. Using these expressions to estimate values of $\delta_{an\ max.}$ from the value of $\delta_{an\ max.}$ for $f_y = 60$ and $e_1/e_2 = 1.0$, $\delta_{an\ max.(f_y = 60,\ e_1/e_2 = 1)}$, would often give errors unsafe by more than 6%. Therefore, many of the values of $\delta_{an\ max.(f_y = 60,\ e_1/e_2 = 1.0)}$ must be increased to ensure that Eqns. 5.7 and 5.8 do not give significant unsafe errors for estimated values of $\delta_{an\ max.}$ for the other values of f_y and e_1/e_2. The amount, if any, that each value of $\delta_{an\ max.(f_y = 60,\ e_1/e_2 = 1.0)}$ must be increased by may be calculated by using the inverse of Eqns. 5.7 and 5.8 to give values of $\delta_{an\ max.(f_y = 60,\ e_1/e_2 = 1.0)}$ which would give the correct values of the parameters, f_y and e_1/e_2. This results in an extra five values of $\delta_{an\ max.(f_y = 60,\ e_1/e_2 = 1.0)}$ for each combination of L/h, e/h, and P_{sus}/P_{an}. Combining these with the actual values of $\delta_{an\ max.(f_y = 60,\ e_1/e_2 = 1.0)}$ gives a set of six values. Using the maximum values for each set, $\delta'_{an\ max.}$, will give conservative values throughout.

These values of $\delta'_{an\ max.}$ for P_{sus}/P_{an} equal to 0.2 and 0.8 were then compared to find a relationship to account for the parameter

P_{sus}/P_{an}. This relationship can be expressed as

$$\delta'_{an\ max.(P_{sus}/P_{an} = 0.8)} = 1 + \frac{1}{y}\{\delta'_{an\ max.(P_{sus}/P_{an} = 0.2)} - 1\} \quad \ldots.\ (5.9)$$

where y depends on e/h and L/h.

Figure 5.14 shows the relationship between y and e/h and L/h. It is seen that the relationship may be approximately expressed by

$$y = 0.62\sqrt{e/h + 0.3(\frac{L}{10h} - 1)^2} + 0.11 \quad \ldots.\ (5.10)$$

The value of $\delta'_{an\ max.}$ for any value of P_{sus}/P_{an} can now be estimated from the value of $\delta'_{an\ max.}$ for P_{sus}/P_{an} equal to 0.2 by the expression

$$\delta'_{an\ max.} = 1 + \{\delta'_{an\ max.(P_{sus}/P_{an} = 0.2)} - 1\} / \{1 - (1-y)(\frac{P_{sus}/P_{an} - 0.2}{0.6})\} \quad \ldots.\ (5.11)$$

However, this expression represents an average relationship and may give significantly unsafe errors for some values of $\delta'_{an\ max.}$. Therefore, Eqn. 5.11 was first used to give a second set of values for $\delta'_{an\ max.(P_{sus}/P_{an} = 0.2)}$ which would give the correct value of $\delta'_{an\ max.}$ for P_{sus}/P_{an} equal to 0.8.

The larger between each value of $\delta'_{an\ max.(e_1/e_2 = 0.2)}$ in this second set and the actual values of $\delta'_{an\ max.(e_1/e_2 = 0.2)}$ was found for each L/h and e/h. These larger values, $\delta''_{an\ max.}$, represent modified values for $\delta_{an\ max.}$ for f_y equal to 60 ksi, e_1/e_2 equal to 1.0, and P_{sus}/P_{an} equal to 0.2. These values, $\delta''_{an\ max.}$, will give only conservative results when estimating values of $\delta_{an\ max.}$, by Eqns. 5.7

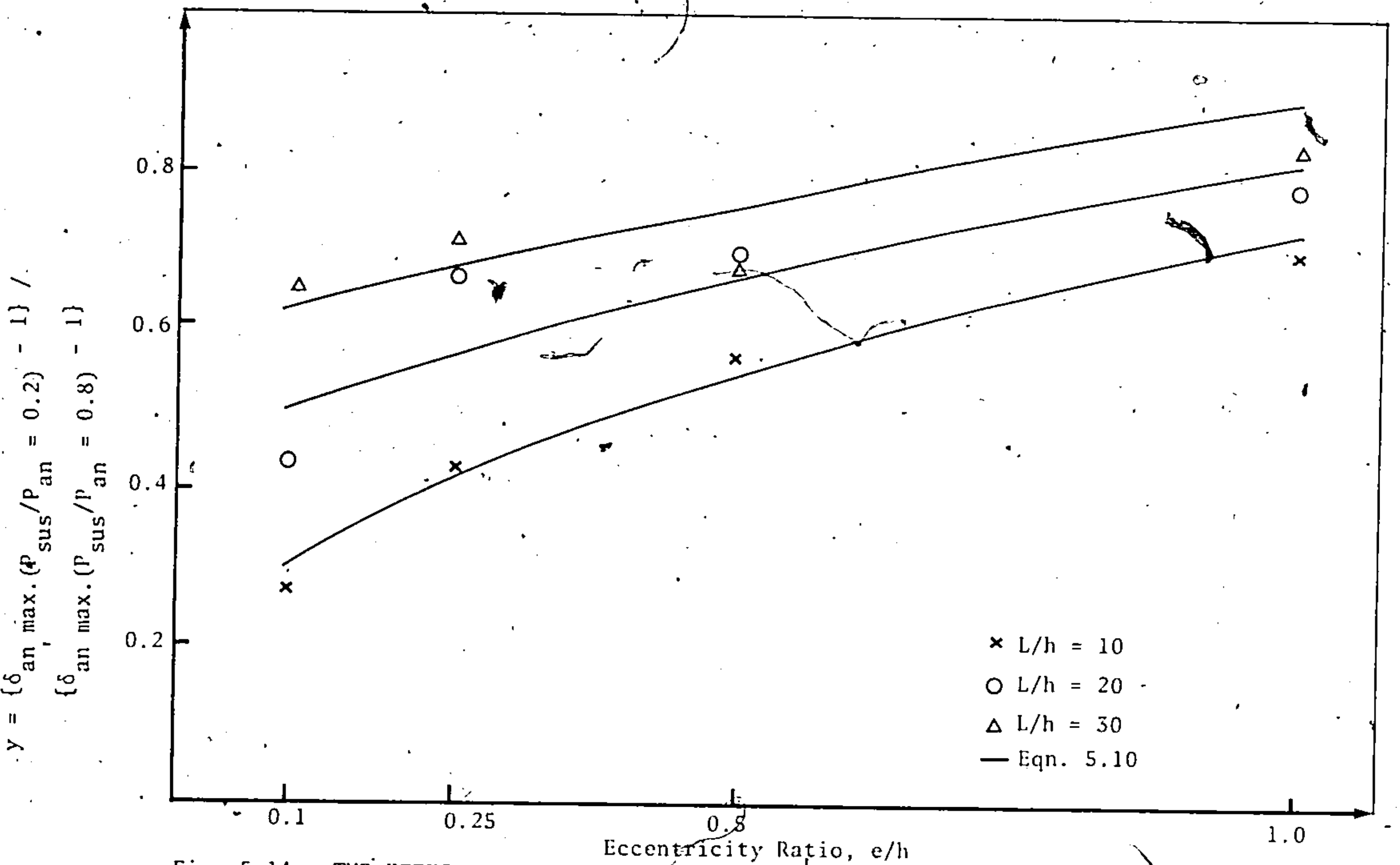

Fig. 5.14 THE EFFECT OF SUSTAINED LOAD ON δ_{an} max.

to 5.11, for other values of the parameters f_y, e_1/e_2, and P_{sus}/P_{an}.

It is noted that the values of $\delta_{an\ max.}$ estimated for intermediate values of P_{sus}/P_{an} in this way, will be conservative since linear interpolation between the values of $\delta_{an\ max.}$ for P_{sus}/P_{an} equal to 0.2 and 0.8 is conservative.

The relationship between $\delta''_{an\ max.}$ and L/h and e/h can now be examined. Since the values of $\delta''_{an\ max.}$ represent values which would give only conservative errors when using Eqns. 5.7 to 5.11, errors on the unsafe side have been eliminated up to this stage. Therefore, in expressing the relationship between $\delta''_{an\ max.}$ and e/h and L/h, an error of 6% on the unsafe side was considered acceptable. It was found that this relationship could be approximately expressed by

$$\delta''_{an\ max.} = 1 + \frac{0.718}{x + 0.065} \qquad \ldots. \ (5.12)$$

$$\text{where } x = \{e/h + 0.076\ (3 - \frac{L}{10h})\}\ \frac{7.633}{(\frac{L}{10h})^{1.85}} \qquad \ldots. \ (5.13)$$

Therefore, a set of equations to estimate the values of $\delta_{an\ max.}$ for all the parameters takes the form

$$x = \{e/h + 0.076(3 - \frac{L}{10h})\}\ \frac{7.633}{(\frac{L}{10h})^{1.85}}$$

$$y = 0.62\ \sqrt{e/h + 0.3\ (\frac{L}{10h} - 1)}\ + 0.11$$

$$z = 1 + \{\frac{0.718}{x + 0.065}\} / \{1 - (1-y)(\frac{P_{sus}/P_{an} - 0.2}{0.6})\}$$

$$\delta_{an\ max.} = z\ \{1 - 0.233\ (1-e_1/e_2)^{1.26}\}\ X\ \{1 - 0.01(\frac{60 - f_y}{20})(\frac{L}{10h})^2\}$$

$$\ldots. \ (5.14)$$

TABLE 5.7 MAXIMUM ERRORS IN COLUMN CAPACITIES PREDICTED BY USING EQN. 5.14

Column Reference	Maximum Negative Error	Maximum Positive Error
1	- 9	32
2	-12	50
3	- 9	37
4	- 6	51
5	- 9	20
6	- 8	31
7	- 6	21
8	- 6	33
9	- 5	14
10	- 6	24
11	- 4	16
12	- 5	26
13	-13	26
14	-10	45
15	- 7	33
16	- 6	46
17	-10	16
18	- 7	25
19	- 4	18
20	- 4	28
21	-13	15
22	- 9	17
23	- 3	18
24	- 3	18

This expression is compared to the actual values of $\delta_{an\ max.}$ in all the graphs of Appendix D. As can be seen from these graphs, the values of $\delta_{an\ max.}$ obtained by this expression agree fairly well with the upper limit of each range of the values of δ_{an} for each specific set of loading conditions.

The tables of Appendix G list the column capacities and errors resulting from use of this expression. Table 5.7 gives the maximum errors for each column for all the loading cases studied and is comparable to Table 5.5. A comparison of both these tables indicates that the use of this expression slightly increases the maximum errors. A comparison between the tables in Appendix G with those representative of the proposed method involving the graphs included in Appendix E, indicates that the conservatism of some individual results is increased by approximately 20% by using the expression (Eqn. 5.14). The accuracy, however, can still be regarded as being acceptable.

It is recognized that the use of the charts is easier and quicker than the manual use of the expression. However, Eqn. 5.14 will be useful in applications using simple computer design programmes or programmable calculators.

5.10 Columns With More Than Two Layers of Reinforcing Steel

Up to now, all the columns studied had only two layers of steel. In practice, however, many columns will also have intermediate steel. The proposed method should be made applicable to these columns in order to extend its usefulness.

It is believed that this can be accomplished by using an equivalent γ to represent cases with more than two layers of reinforcing steel.

Figures 5.1 to 5.4 indicated that the effect of γ is greatest for columns with high steel percentages, low eccentricity ratios, and with f_y equal to 60 ksi. It can be expected that the concept of an equivalent γ is best evaluated at these conditions. Figures 5.1 and 5.2 indicated the maximum value of δ_{an} for columns with L/h equal to 30, e/h equal to 0.1, e_1/e_2 equal to 1.0, and P_{sus}/P_{an} equal to 0.0, occurred for ρ equal to 4.0%, f_c' equal to 3 ksi, f_y equal to 60 ksi, and γ equal to 0.65.

For these reasons, the concept of an equivalent γ was studied for columns with L/h equal to 30 and e/h equal to 0.1 and with cross sections with f_c' equal to 3 ksi, f_y equal to 60 ksi, and ρ equal to 4.0%. The columns had symmetric end moments and were loaded to short-term failure.

Ten columns with four layers of steel were studied. The ratio of outer steel to inner steel and the distance between the layers of reinforcing was varied as given in Table 5.8.

TABLE 5.8 STEEL AREAS AND POSITIONS USED IN THE STUDY OF COLUMNS WITH FOUR LAYERS OF REINFORCING STEEL

Column	Steel Percentage in Outer Layer (%)	Steel Percentage in Inner Layer (%)	Distance Ratio Between the Outer Steel Layers	Distance Ratio Between the Inner Steel Layers	Equivalent γ (From Eqn. 5.15)
A	2.67	1.33	0.65	0.30	0.559
B	2.67	1.33	0.65	0.475	0.598
C	2.67	1.33	0.70	0.40	0.617
D	2.67	1.33	0.70	0.55	0.654
E	2.67	1.33	0.75	0.50	0.677
F	2.67	1.33	0.80	0.60	0.740
G	2.0	2.0	0.65	0.30	0.506
H	2.0	2.0	0.65	0.475	0.569
I	2.0	2.0	0.85	0.40	0.664
J	2.0	2.0	0.85	0.70	0.779

Figure 5.15 shows the three values of δ_{an} reproduced from Fig. 5.2 for the above section properties and loading conditions for γ equal to 0.65, 0.75, and 0.85. It is seen that the relationship between δ_{an} and γ for these three cases is almost linear as indicated by the straight line in Fig. 5.15. The values of δ_{an} for the ten columns with four layers of steel should lie close to this relationship when plotted against equivalent values of γ.

The equivalent γ used in plotting the points for columns with four layers of steel was calculated by

$$\gamma_{equiv} = \sqrt{\frac{\rho_1 \gamma_1^2 + \rho_2 \gamma_2^2}{\rho_1 + \rho_2}} \qquad \ldots\ (5.15)$$

where ρ_1 and ρ_2 are the steel percentages of the outer and inner layers of reinforcing steel respectively,

γ_1 and γ_2 are the corresponding distance ratios between the layers.

It is seen from Fig. 5.15 that the linear relationship between δ_{an} and γ for the three cases with two layers of steel is simulated fairly accurately when the values of δ_{an} for four layers of steel are plotted against this equivalent γ. A similar graph using a linear expression for an equivalent γ indicated that Eqn. 5.15 appeared to be a better expression for an equivalent γ.

On this basis, it is believed that the proposed method is applicable to columns with more than two layers of reinforcing steel provided an equivalent γ is calculated by Eqn. 5.15.

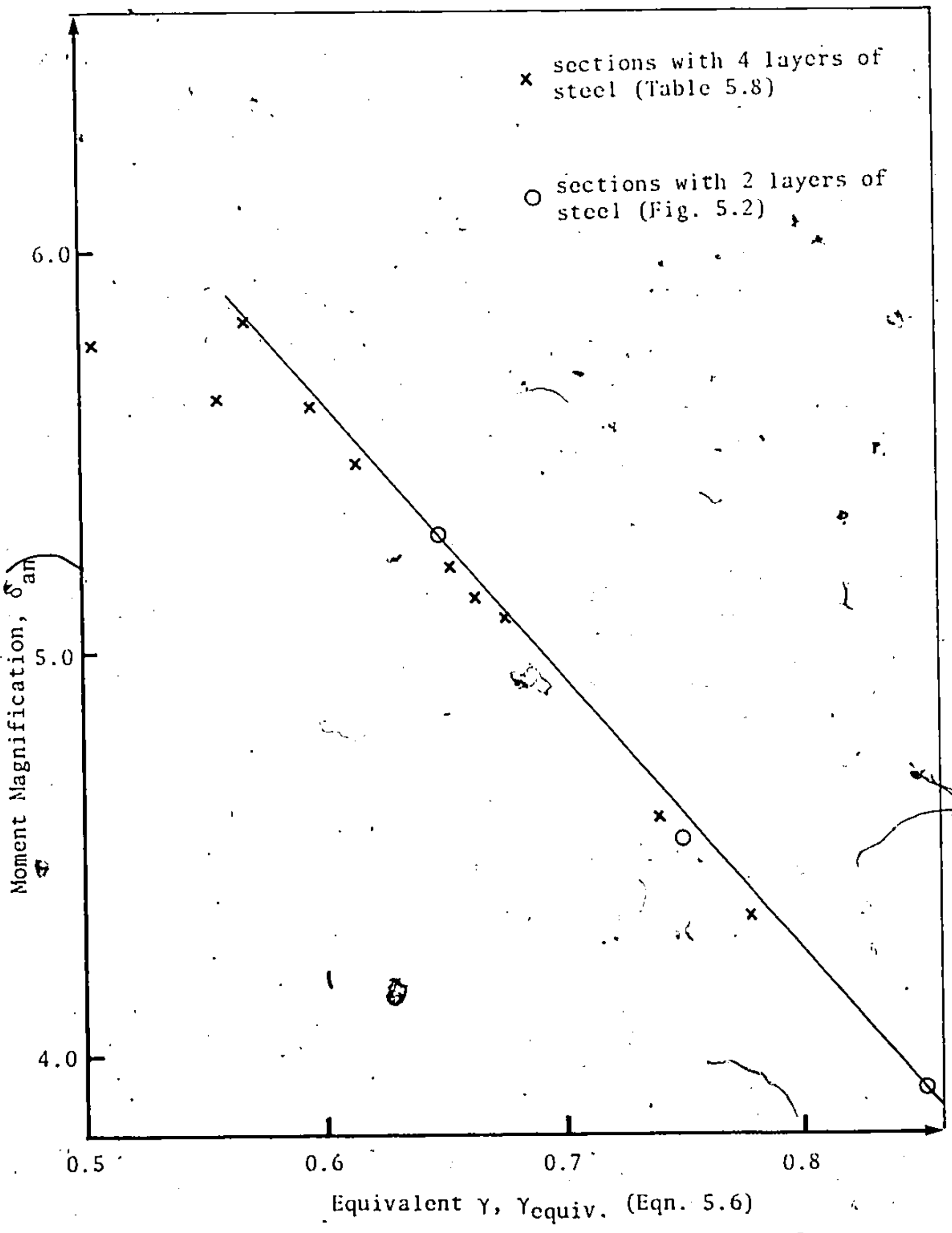

Fig. 5.15 VALUES OF δ_{an} FOR SECTIONS WITH FOUR LAYERS OF STEEL

A further consideration arises for columns with intermediate steel. The value of γ for two layers of steel is usually greater than 0.65 in practice. It is recognized, however, that this value is not a sensible limit for values of equivalent γ for columns with intermediate steel. Therefore, it would be desirable if the proposed method could be adapted to columns with lower values of γ.

To this end, the maximum value of δ_{an} which occurred for all values of ρ and f_c' included in the general study when found for γ equal to 0.65 and γ equal to 0.85. These values were then compared over the entire range of loading conditions for f_y equal to 40 ksi and 60 ksi in order to find the effect of γ.

It was found that γ had little effect for L/h equal 10 or for f_y equal to 40 ksi. For f_y equal to 60 ksi and L/h equal to 20 or 30, γ had a significant effect. The comparison at L/h equal to 30 indicated that the maximum values of δ_{an} for γ equal to 0.65 were up to 20% greater than the corresponding values for γ equal to 0.85. This difference was about 10% for columns with L/h equal to 20.

The approximate linearity of the relationship between values of δ_{an} and γ may be noted from Figs. 5.1 to 5.4. Furthermore, Fig. 5.15 indicates that values of δ_{an} at low values of equivalent γ tend to be on the safe side of the line between the values of δ_{an} for two layers of steel with γ equal to 0.65 and 0.85.

Therefore, it is believed that values of $\delta_{an\ max.}$ for a γ less than 0.65 may be estimated by multiplying the values of δ_{an} max., indicated by the graphs in Appendix D, by a factor proportional to the increase which occurs between values of 0.85 and 0.65.

In this way, the values of $\delta_{an\ max.}$ for γ between 0.5 and 0.65 may be expressed in terms of the values $\delta_{an\ max.}$ already found for the general range studied (the upper limits of the ranges shown in the graphs in Appendix D). This expression is given by

$$\delta_{an\ max.(0.5 < \gamma < 0.65)}$$

$$= \delta_{an\ max.(0.65 \leq \gamma \leq 0.85)} \times \{1 + 0.05\ (0.65 - \gamma)\ (L/h - 10)\} \qquad \ldots\ (5.16)$$

where $\delta_{an\ max.\ (0.65 \leq \gamma \leq 0.85)}$ is the maximum value of δ_{an} found in the general study for a specific f_y and specific loading conditions and may be found from the graphs of Appendix D.

On the basis of this study, γ in Eqn. 5.16 may be replaced by an equivalent γ as given by Eqn. 5.15 for columns with more than two layers of reinforcing steel.

5.11 Limitations of the Proposed Direct Moment Magnification Method

As discussed in a previous section, the proposed method is sufficiently accurate over the range of parameters studied. Its applicability beyond this range should be identified.

As indicated by Figs. 5.1 to 5.4, the effect of f_c' on δ_{an} is not very significant. Furthermore, as shown by Table 5.5, an increase in f_c' generally decreases the maximum negative error. Therefore, it is believed that the application of the proposed method may be extended to columns with f_c' equal to 6 ksi.

The steel percentage can have a significant effect on δ_{an} as indicated by Table 5.1 to 5.4. Furthermore, the maximum values of δ_{an} may occur for either extreme of this parameter, as indicated by Tables 5.3 and 5.4. Therefore, in the absence of further study, this method must be limited to columns with ρ between 1.0% and 4.0%. This does not severely restrict the usefulness of the method since most columns in practice will have steel percentages within this range.

The proposed method was based on a study of columns with two layers of steel with γ between 0.65 and 0.85. However, as discussed in the previous section, the method can be modified for columns with γ between 0.5 and 0.65 and for cases with intermediate steel. Therefore, it is applicable to the majority of practical cases.

Moment magnifications are presented for f_y equal to 40 ksi and 60 ksi. The use of steel with yield strengths between these values will require interpolation of the graphs in Appendix D. Because the values of moment magnification increase as f_y increases, the proposed method is limited to columns with f_y less than or equal to 60 ksi.

The proposed method is limited to columns with rectangular cross sections.

5.12 1963 CEB Recommendations

An earlier direct moment magnification method has been presented in the 1963 CEB Recommendations(52). In this method, the moment magnification is expressed by an equation dependent on L/h, e/h, and the degree of end restraint. Sustained loading can be accounted for by multiplying the moment magnification by a factor, generally taken as $1+(P_{sus}/P_{an})/3$ (52). No modification was suggested for nonsymmetric end moments.

The resulting moment magnifications using the above modification for sustained loading are given in Figs. D.11 to D.14. A comparison of those values with the range of the analytical results shown in these figures indicates that the method gives relatively high unsafe values for columns of high slenderness, especially for e/h in the region of 0.25. These errors increase for increased levels of sustained load.

CHAPTER 6

A STUDY OF THE ACI MOMENT MAGNIFIER METHOD

6.1 Introduction

The ACI Moment Magnifier Method for the analysis of slender reinforced concrete columns has gained wide acceptance since its proposal by MacGregor, Breen, Pfrang(49) in 1970. It has essentially replaced the older Reduction Factor Method(4) and is the accepted method of both the Canadian and American concrete design codes(5,14).

However, it has been reported(25,28,72) that this method can be quite conservative in some cases. Recent statistical studies(50,57) over a large range of cross section and loading parameters have indicated the difficulty in improving its accuracy. It is believed that no comprehensive study of the method has been made which adequately defines the errors involved and identifies the effects of the parameters on these errors.

This chapter includes a summary of the ACI Moment Magnifier Method. A study of its accuracy is reported and a modification to the method of estimating cross section stiffness for use in the method is presented.

6.2 A Review of the ACI Moment Magnifier Method

The ACI Moment Magnifier Method has been well presented by MacGregor, Breen, Pfrang(49) and is, of course, given in the North American design codes(5,14). For convenience, the topics relevant to uniaxially loaded slender columns in braced frames are briefly reviewed.

MacGregor, Breen, Pfrang(49) reported that the most significant factors considered in choosing the present ACI Moment Magnifier Method were accuracy, rationality, ease of use, and familiarity. A discussion on accuracy is contained in the next section and a review of the other factors is made here.

6.2.1 Description of the Method:

The ultimate maximum moment occurring in a slender column may be estimated by(49)

$$M_{max.} = \frac{C_m M_o}{1 - (P/P_c)} \geqslant M_o \qquad .... (6.1)$$

where M_o is the largest first order moment acting on the column

P is the axial load acting on the column

P_c is the critical load of the column (Euler buckling load)

and C_m is a factor to account for asymmetric loading cases.

Equation 6.1 is referred to herein as the basic moment magnification equation. It is the equation adopted in a modified form by the American and Canadian concrete codes. The following are the recommendations of the design codes, for the design of uniaxially loaded slender columns in braced frames. Equation numbers follow the format of this presentation and do not correspond with either of the codes.

Slender reinforced concrete columns are designed by the ACI Moment Magnifier Method by using the design axial load, P_u, and a magnified moment, M_c, defined by

$$M_c = \delta M_2 \qquad \text{.... (6.2)}$$

$$\text{where } \delta = \frac{C_m}{1 - \frac{P_u}{\varnothing P_c}} \geqslant 1.0 \qquad \text{.... (6.3)}$$

$$\text{and } P_c = \frac{\pi^2 EI}{(kl_u)^2} \qquad \text{.... (6.4)}$$

where M_2 is the value of the larger design end moment acting on the column. In the case of columns loaded between their ends, M_2 is taken as the maximum moment along the column and P_u is the design axial load acting on the column.

For columns braced against side-sway and without transverse loads between the ends, C_m may be taken as

$$C_m = 0.6 + 0.4 \ M_1/M_4 \geqslant 0.4 \qquad \text{.... (6.5)}$$

For all other cases, C_m is taken as 1.0

In lieu of a more precise analysis, EI is taken either as

$$EI = \frac{0.2 \text{ X } E_c I_g + E_s I_{se}}{1 + \beta_d} \qquad \text{.... (6.6)}$$

or

$$EI = \frac{0.4 \text{ X } E_c I_g}{1 + \beta_d} \qquad \text{.... (6.7)}$$

where E_c is the modulus of elasticity of concrete and may be taken, for normal weight concrete, as

$$E_c = 57000 \sqrt{f_c'}$$

where E_c and f_c' are in psi units.

E_s is the modulus of elasticity of the reinforcement, generally taken as 29 X 10^6 psi

I_g is the moment of inertia of the gross concrete section about the centroidal axis, neglecting the reinforcement

I_s is the moment of inertia of reinforcement about the centroidal axis of the cross section

and β_d is the ratio of maximum design dead load moment to maximum design total load moment, always between zero and one.

The use of Eqn. 6.7 is considered to be conservative and Eqn. 6.6 is the preferred expression for EI.

ϕ is the capacity reduction factor to account for section understrength.

k is the effective length factor of the column. For columns braced against side-sway, it is recommended that the effective length factor k be taken as 1.0, unless an analysis shows that a lower value may be used.

6.2.2 Comments on the Code Recommendations: The design axial load, P_u, and magnified moment, M_c, must be within the section capacity interaction diagram calculated by including the capacity reduction factor, ϕ. The inclusion of the ϕ factor in Eqn. 6.3 might give the impression that the ϕ factor is included twice in slender column design. However, the imperfections in materials and construction which would reduce the section capacity would also reduce the stiffness of the section. Therefore, the value of P_c used in Eqn. 6.3 should also be multiplied by a reduction factor. Using the capacity reduction factor, ϕ, for this reduction would appear to be justified. This is further discussed in Section 6.7.

The design codes recommend that the effective length factor k be taken as 1.0 unless an analysis shows that a lower value may be used. However, the codes do not give guidelines as to the analysis which would be required.

In braced frames the beams usually transfer moment to the columns and, therefore, do not restrain the columns. In cases of columns loaded at one end and restrained by the beams at the other, the restraining effect of the beams is calculated as a moment with a reverse direction to the applied moment. Therefore, the effect of this restraint is already accounted for by the C_m factor. It is believed that the effective length factor, k, should always be taken as 1.0 for these cases. The use of an effective length factor less than 1.0 may be justified in cases where the load is applied at the minimum eccentricity ratio of 0.1 to account for column imperfections. In these cases, the beams at both ends might have a significant effect on slender column capacity by restraining the column. Further research is required on columns subjected to bending moments due to imperfections in construction.

6.2.3 Rationality of the Method: The ACI Moment Magnifier Method may be regarded as being a rational method because of its theoretical basis(49).

The theoretical solution of an elastic column subjected to end loads only, with no end translation permitted, was reviewed by Wang & Salmon(83). The maximum moment occurring over the column is given by

$$M_{max.} = M_2 \sqrt{\frac{1 - 2\,(M_1/M_2)\cos\lambda L + (M_1/M_2)^2}{\sin^2\lambda L}} \qquad \ldots .\ (6.8)$$

where M_1, M_2 are the end moments with $M_2 > M_1$

$$\lambda = \sqrt{P/EI} \qquad \ldots .\ (6.9)$$

and P is the axial load acting on the column.

EI is the constant stiffness of the column section.

This can be rearranged in the form

$$M_{max.} = M_{equiv.} \sqrt{\frac{2(1 - \cos\lambda L)}{\sin^2\lambda L.}} \qquad \ldots .\ (6.10)$$

$$\text{where } M_{equiv.} = M_2 \sqrt{\frac{(M_1/M_2)^2 - 2(M_1/M_2)\cos\lambda L + 1}{2(1 - \cos\lambda L)}} \qquad \ldots .\ (6.11)$$

For a column subjected to symmetric end moments, M_o, this becomes

$$M_{max.} = M_o \sqrt{\frac{2(1 - \cos\lambda L)}{\sin^2\lambda L}} \qquad \ldots .\ (6.12)$$

This can be approximated quite accurately by

$$M_{max.} = M_o + \frac{P\Delta_o}{1 - P/P_c} \qquad \ldots .\ (6.13)$$

where Δ_o is the deflection due to M_o only and can be given by

$$\Delta_o = \frac{M_o L^2}{8EI} \qquad \text{.... (6.14)}$$

and P_c is the Euler buckling load given by

$$P_c = \frac{\pi^2 EI}{L^2} \qquad \text{.... (6.15)}$$

Thus, Eqn. 6.13 can be rearranged to

$$M_{max.} = M_o \{1 + \frac{\pi^2/8}{[\frac{\pi^2}{(\lambda L)^2} - 1]}\} \qquad \text{.... (6.16)}$$

A further approximation to this, by approximating $\pi^2/8$ as unity, is

$$M_{max.} = M_o [\frac{1}{1 - \frac{(\pi L)^2}{\pi^2}}] \qquad \text{.... (6.17)}$$

Equation 6.17 can be rearranged to

$$M_{max.} = \frac{M_o}{1 - P/P_c} \qquad \text{.... (6.18)}$$

In the general case of unequal end moments, Eqn. 6.18 can be approximated by Eqn. 6.1 which is the basic equation of the ACI Moment Magnifier Method.

Fig. 6.1 shows the comparison of the ratio $M_{max.}/M_2$ from Eqn. 6.1 and 6.8 for different levels of the end moment ratio, M_1/M_2. For symmetric curvature it is seen that Eqn. 6.1 underestimates the magnification required for a truly elastic column. This can be corrected by reducing the parameter $\sqrt{P/P_c}$ through decreasing the stiffness of the column cross section. This, however, would result in increased conservatism for columns loaded in double curvature.

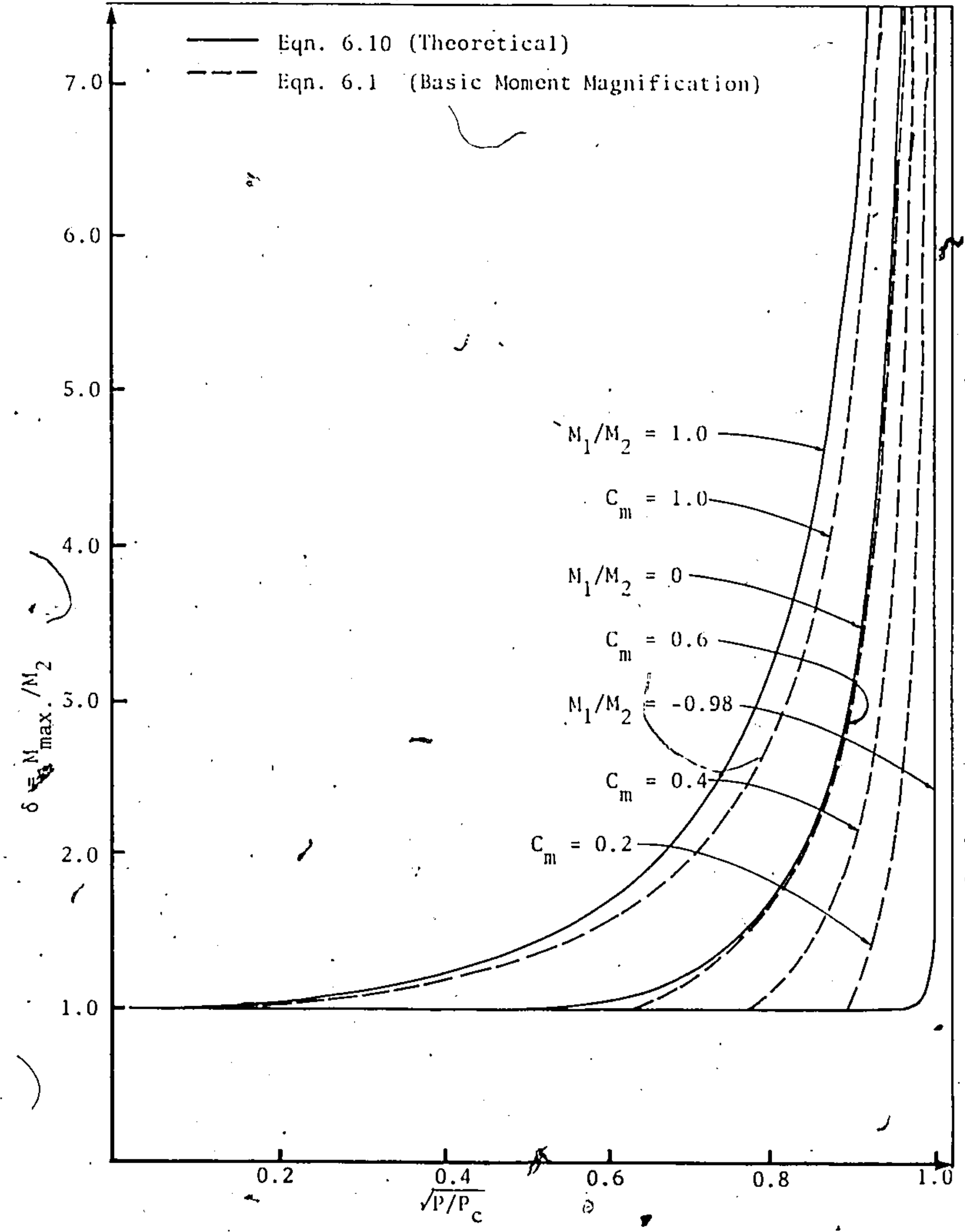

Fig. 6.1 COMPARISON OF ACI MOMENT MAGNIFICATION WITH THE THEORETICAL SOLUTION FOR AN ELASTIC COLUMN

A comparison of the moment magnifications given by the theoretical solution for cases with $e_1/e_2 = -0.98$ with those given by Eqn. 6.1 indicates that the use of a C_m equal to 0.2 in Eqn. 6.1 is conservative for elastic columns in antisymmetric curvature. It is of interest to note that the lower limit for C_m of 0.4 was originally suggested in steel design to avoid lateral-torsional buckling and was retained by the ACI because of the suggested uncertainty of frame action when values of e_1/e_2 are between -0.5 and -1.0(49).

Although the ACI Moment Magnifier Method does have a theoretical basis, its rationality may be questioned considering the assumption of constant cross section stiffness. Since the stiffness of a reinforced concrete section depends on the level of axial load and bending moment, it is affected by all of the column loading parameters.

6.2.4 Ease of Use: As discussed in Section 5.1, the ACI Moment Magnifier Method is not easy to use. Its use in predicting column capacity requires iterations since the magnification depends on the axial load. A further difficulty occurs in design since the section properties are needed to find the moment magnification.

Typical analysis and design examples are given by Wang and Salmon(83).

6.2.5 Familiarity: The ACI Moment Magnifier Method was favo[illegible] to some extent because of its similarity to established methods in Steel Design(49). Today it can be regarded as being familiar to all designers of reinforced concrete structures.

While familiarity is certainly a bonus for any method, it is suggested here that it should not be regarded as one of the more important factors.

6.3 Accuracy of the ACI Moment Magnifier Method

The tables in Appendix F give the column capacities predicted by the ACI Moment Magnifier Method for columns with the range of section parameters listed in Table 5.2 and for the loading conditions discussed in Section 5.5. These capacities are ultimate values and do not include the capacity reduction factor. The preferred expression for EI, (Eqn. 6.6), was used to estimate cross section stiffness.

The errors in these capacities as measured by comparison with the capacities predicted by the analytical method (Eqn. 5.5) are also included in the tables.

Histograms showing the frequency distributions of these errors have been shown in Figs. 5.11 and 5.12. It was noted that approximately 62% of the errors are within ±10% and that approximately 25% are more conservative than 20%.

In order to examine the relationship between errors and the various section properties and loading conditions, the errors indicated by the tables of Appendix F are reproduced in Table 6.1 for 16 loading cases and for all the sections with ρ equal to 1.0% and 4.0%. The 16 loading conditions are listed in Table 6.1 and were chosen to be

TABLE 6.1 ERRORS IN PREDICTING COLUMN CAPACITY BY THE ACI MOMENT MAGNIFIER METHOD

L/h	Loading Conditions			Column Reference															
	e_1/e_2	P_{sus}/P_{an}	e/h	1	2	3	4	9	10	11	12	13	14	15	16	21	22	23	24
10	1.0	0.0	0.1	-5	-1	-6	-3	-6	-5	-7	-7	-3	0	-5	-3	-4	-3	-4	-5
			1.0	-11	-14	-9	-8	-2	-3	-2	-3	-6	-9	-7	-8	-1	-2	-4	-2
		0.8	0.1	-15	-1	-18	-3	-16	-9	-15	-10	-10	4	-16	-1	-11	-4	-12	-7
			1.0	-14	20	-7	-7	-5	-2	-4	-3	-8	-13	-5	-5	-3	1	-3	-1
	-0.98	0.0	0.1	-5	-5	-5	-5	-3	-4	-3	-4	-5	-5	-5	-5	-2	-3	-2	-3
			1.0	-2	-1	0	1	-1	1	0	0	0	-1	0	0	0	+1	-2	-1
		0.8	0.1	-5	-1	-5	-5	-3	-4	-3	-4	-5	1	-5	-5	-2	-3	-2	-3
			1.0	-2	-1	0	1	-1	1	0	0	0	-1	0	0	0	1	-2	-1
30	1.0	0.0	0.1	31	47	25	41	9	21	-1	11	29	45	22	39	6	20	5	14
			1.0	-17	-23	-14	-14	-7	-5	-6	-5	-16	-19	-14	-14	-7	-5	-5	-6
		0.8	0.1	26	48	25	45	23	35	9	24	-28	48	32	48	30	39	23	33
			1.0	-18	-23	-5	-6	3	5	1	5	-12	-14	-1	-2	9	10	6	10
	-0.98	0.0	0.1	52	63	44	57	34	46	17	30	52	63	43	57	33	45	22	32
			1.0	-2	-1	0	1	-1	1	0	0	0	-1	0	0	0	1	-2	-1
		0.8	0.1	64	75	56	70	49	62	31	48	67	76	61	72	70	66	47	57
			1.0	-2	-1	0	1	12	14	0	3	8	3	8	57	27	31	14	22

representative of the extremes of the entire range of loading cases.

On the basis of Table 6.1, the following are indicated:

1. <u>Negative Errors</u> - Generally negative errors occur for L/h equal to 10. These errors are greater for P_{sus}/P_{an} equal to 0.8. For this level of P_{sus}/P_{an} the errors are greater for f_c' equal to 3 ksi. For short-term loading, however, f_c' seems to have no general effect. No consistent effect is apparent for the other section properties.

   Negative errors also occur for e/h equal to 1.0. These are greatest for ρ equal to 1% and γ equal to 0.65.

   Negative errors decrease for cases with $e_1/e_2 = -0.98$.

2. <u>Positive Errors</u> - Conservative errors occur for L/h equal to 30 and e/h equal to 0.1. These errors are greatest for f_c' equal to 5 ksi, ρ equal to 1%, and γ equal to 0.65. The errors increase for e_1/e_2 equal to -0.98 and for P_{sus}/P_{an} equal to 0.8.

The tables in Appendix F indicate that the above trends are typical of the entire loading range studied. Generally, it can be concluded that capacities are overestimated for columns with low values of L/h or high values of e/h. Column capacities are generally underestimated for columns with high values of L/h and low values of e/h. This conservatism increases for a decrease in the steel parameters, ρ and γ, and for an increase in concrete strength, and also increases as the end eccentricity ratio, e_1/e_2, tends to -1.0. Conservative errors are ~~also incr~~eased for cases of sustained loading, however, this increase is not significantly affected by the level of sustained load. This is partly due to the fact that the ACI Moment Magnifier Method does not account for the gain in concrete strength with age.

6.4 Reasons for Inaccuracies in the ACI Moment Magnifier Method

It has been shown that rather large conservative errors occur in using the ACI Moment Magnifier Method to predict the capacities of slender columns with low values of the steel parameters, ρ and γ, and high concrete strength when the end eccentricity is small. This suggests that the contribution of the concrete to the section stiffness is underestimated by the expression used in the ACI Method (Eqn. 6.6). The fact that these conservative errors do not occur for larger eccentricities tends to indicate that the contribution of the concrete to the stiffness decreases as the eccentricity increases.

Each combination of axial load and bending moment acting on a reinforced concrete cross section gives a corresponding strain distribution. The stiffness of the cross section under this combination of loads may be estimated by dividing the moment by the corresponding curvature indicated by the strain distribution. Figure 6.2 shows contours of stiffness estimated in this way for the cross section of Column 1. It indicates that the stiffness is quite dependent on the applied loads. For a specific eccentricity, the stiffness decreases as the axial load increases. For a specific value of axial load, the stiffness decreases as the eccentricity increases. Since the cross section of Column 1 has low values of ρ and γ, the variation in stiffness as indicated in Fig. 6.2 can be

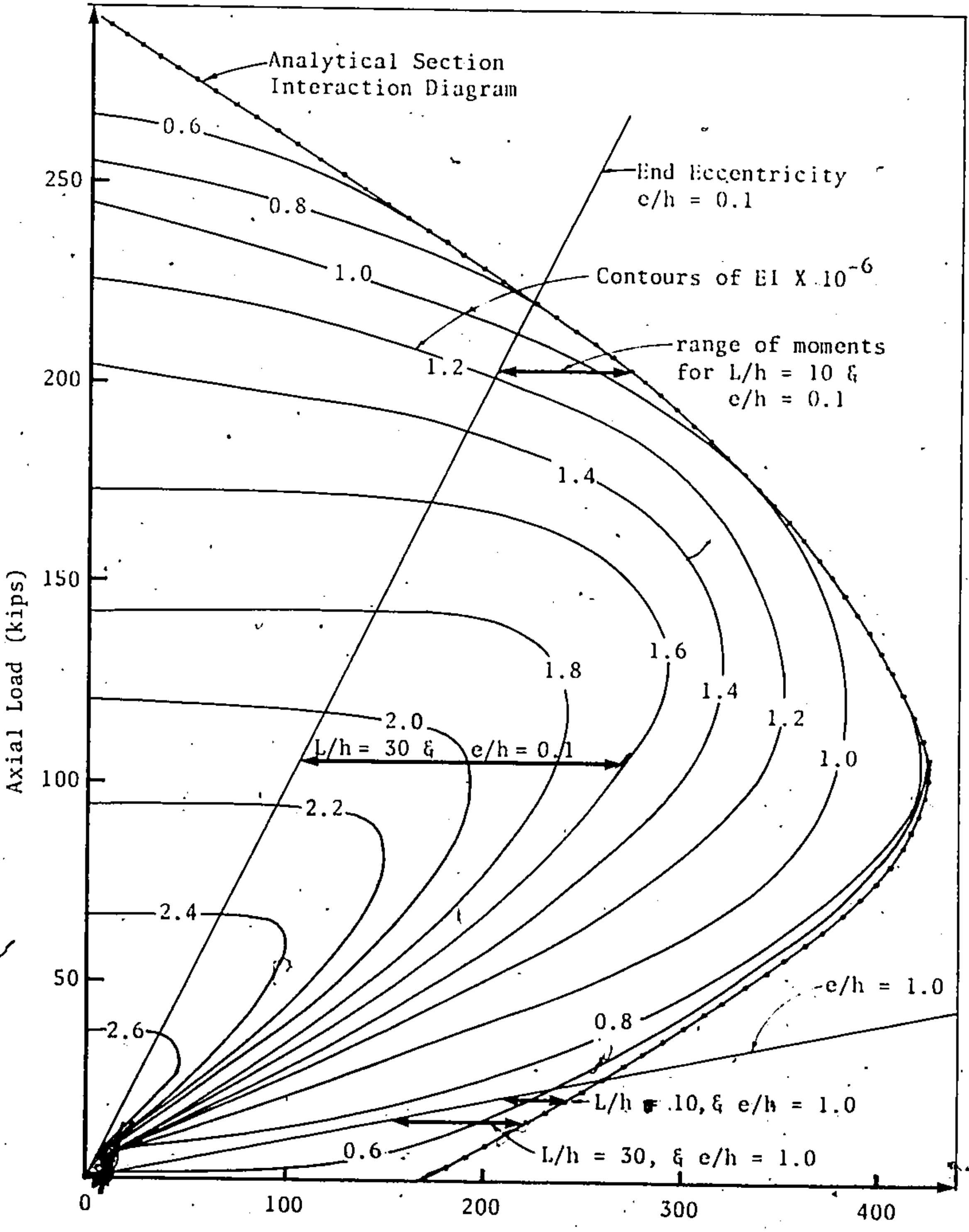

Fig. 6.2 STIFFNESS CONTOURS FOR SECTION OF COLUMN "1"
($f_c' = 3$ ksi, $f_y = 40$ ksi, $\rho = 1.0\%$, $\gamma = 0.65$).

expected to be larger than that for other sections in this study.

Therefore, the stiffness of a slender column is dependent on the axial load and the eccentricity. Since the moment varies along the length of a slender column due to slenderness effects, the cross sectional stiffness will also vary along the length.

Figure 6.2 shows the range of moments at the ultimate capacity of four symmetrically loaded columns with this cross section. The lowest value of moment occurs at the line representing the end eccentricity. The maximum value occurs at the section interaction diagram for columns which fail by material failure, but at a point inside the interaction diagram for buckling failures. The range of stiffness along the length of each of these columns is indicated by Fig. 6.2.

It is seen that this range differs significantly for each column depending on the value of L/h and e/h. The ACI Moment Magnifier Method does not account for these differences. The preferred expression for EI (Eqn. 6.6) gives a constant stiffness equal to 0.827 X 10^6 kips - sq. in. for columns with this cross section.

The column with L/h equal to 10 and e/h equal to 0.1 has section stiffness at failure ranging from approximately 0.9 X 10^6 to 1.2 X 10^6 kips - sq. in. as is indicated in Fig. 6.2. Since this range is above the EI value of the ACI Method, the ACI Moment Magnifier Method would be expected to give slightly conservative results in predicting the capacity of this column. However, a slight error on the unsafe side actually occurs. This is partly due to the fact that the ACI Rectangular Stress Block Method predicts approximately 5% higher section capacities than the analytical method when compression controls. It is also the result of the approximations involved in the basic moment magnification method (Eqn. 6.1) as discussed in Section 6.3.

The column with L/h equal to 30 and e/h equal to 1.0 has a range of stiffness at failure of approximately 0.75×10^6 to 0.55×10^6 kips - sq. in. This explains the unsafe error of 17% which occurs in the ACI Moment Magnifier Method in predicting the capacity of this column.

The column with L/h equal to 30 and e/h equal to 0.1 has stiffness at failure ranging from approximately 1.6×10^6 to 2.1×10^6 kips - sq. in. The conservative error of 31% in predicting the capacity of this column by the ACI Moment Magnifier Method can be explained by comparing these values of EI with that calculated by Eqn. 6.6 as given above.

It may be noted that the minimum section stiffness is greater for columns which fail by buckling rather than by material failure. Buckling failures occur when both L/h is high and e/h is low. Large conservative errors can be expected for these conditions. This error is partly reduced by the fact that the basic moment magnification equation (Eqn. 6.1) is theoretically applicable only to material failure cases.

6.5 A More Accurate Expression for Stiffness

In the previous section, it was shown that stiffness depends on the magnitude of the axial load and moment. An expression for stiffness, EI, dependent on the loads would create much difficulty in using the ACI Moment Magnifier Method since further iterations would be required. It was thought that the effect of axial load and moment on stiffness could be accounted for, to some extent, by estimating stiffness, EI, on the basis of section properties and the parameters L/h and e/h.

The basic moment magnification equation (Eqn. 6.1) can be rearranged in the form

$$EI = \left(\frac{P\ \delta}{\delta - C_m}\right) L^2/\pi^2 \qquad \text{.... (6.19)}$$

Values of EI which would give the same results as the analytical method, when used with the basic moment magnification equation (Eqn. 6.1) and an analytical section interaction diagram, can be calculated from

$$EI_{an} = \left(\frac{P_{an}\ \delta_{an}}{\delta_{an} - C_m}\right) \frac{L^2}{\pi^2} \qquad \text{.... (6.20)}$$

Figure 6.3 shows the relationship between section parameters and the values of EI_{an} for L/h equal to 30, e/h equal to 0.1, e_1/e_2 equal to 0.0. The relationships between EI_{an} and ρ can be closely approximated by a series of straight lines. It is seen that the lines, for a particular value of f_c', almost intersect at ρ equal to 0. This indicates that EI_{an} may be approximately divided into concrete and steel components. The steel component can be assumed to be linear for ρ and

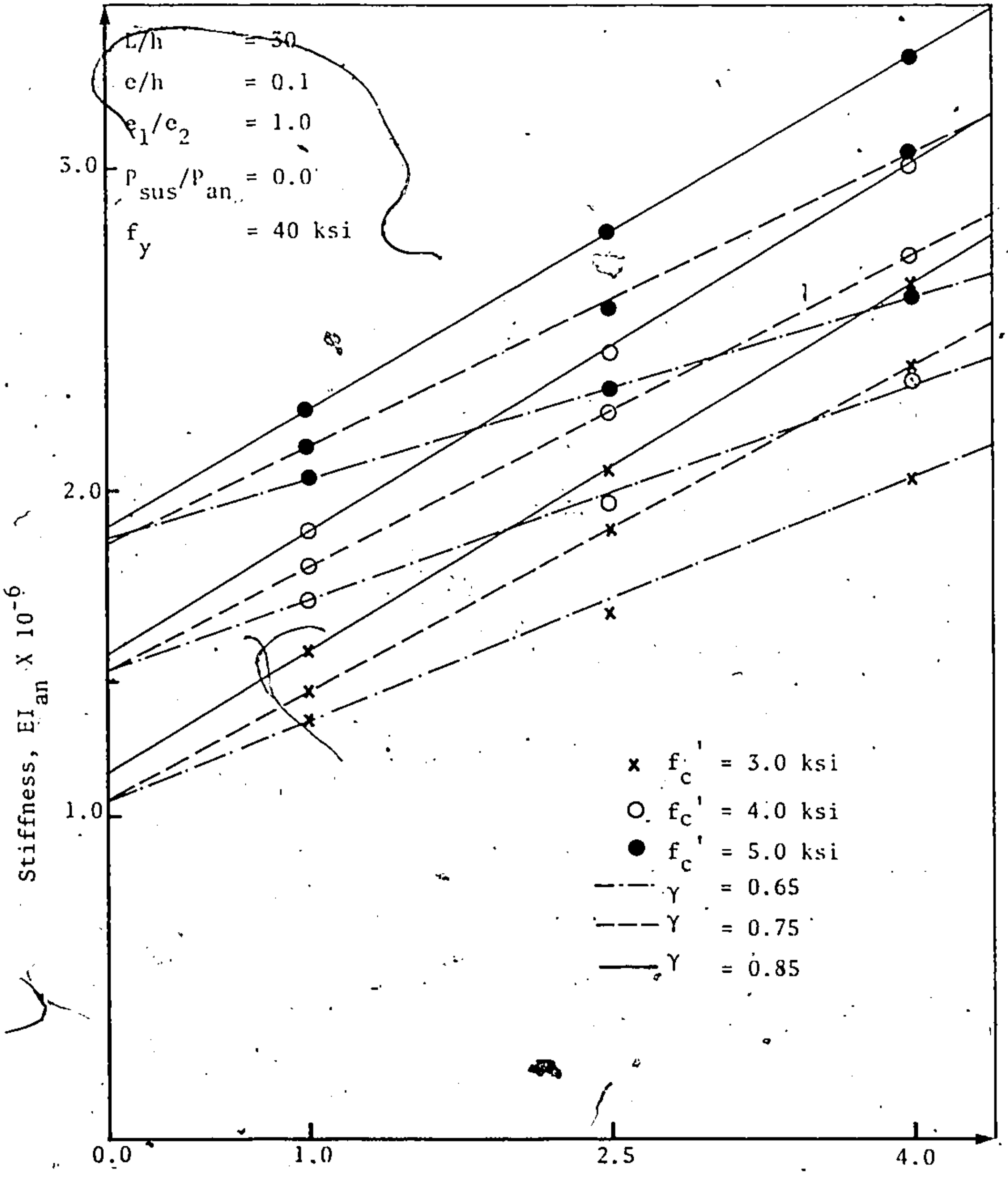

Fig. 6.3 THE EFFECT OF SECTION PROPERTIES ON EI_{an}

was found to be approximately proportional to γ^2.

Figure 6.4 shows the relationship between EI_{an} and $\rho\gamma^2$ for e_1/e_2 equal to 1.0 and P_{sus}/P_{an} equal to 0.0, for four combinations of f_c', L/h, and e/h. Figure 6.4 indicates that EI_{an} depends on both L/h and e/h. A comparison between the values of EI_{an} for f_c' equal to 3 ksi and 5 ksi for the condition with L/h equal to 30 and e/h equal to 0.1 indicates that the concrete component of the value of EI_{an} is approximately proportional to f_c'. A comparison between values of EI_{an} for f_y equal to 40 ksi and 60 ksi indicates that the effect of f_y on EI_{an} is not consistent. This effect, however, is small enough to be neglected. Therefore, a general expression for EI_{an} can be found in

$$EI_{an} = C_c \, f_c' + C_s \, \rho\gamma^2 \qquad \text{.... (6.21)}$$

where C_c and C_s depend on L/h and e/h.

Figure 6.4 also shows the values of EI given by the ACI expression (Eqn. 6.6) for f_c' equal to 3 ksi. It gives conservative estimates of EI for columns with high slenderness and low values of $\rho\gamma^2$. This corresponds with the conservative errors in predicting column capacity found for these conditions. The unsafe errors which occur for columns with low slenderness and high values of $\rho\gamma^2$ correspond to the overestimation of the stiffness for these conditions. These errors, however, are not as large as might be inferred from Fig. 6.4. This is due to the fact that the predicted column capacities using the basic moment magnification equation (Eqn. 6.1) are not very sensitive to the values of EI at low slenderness.

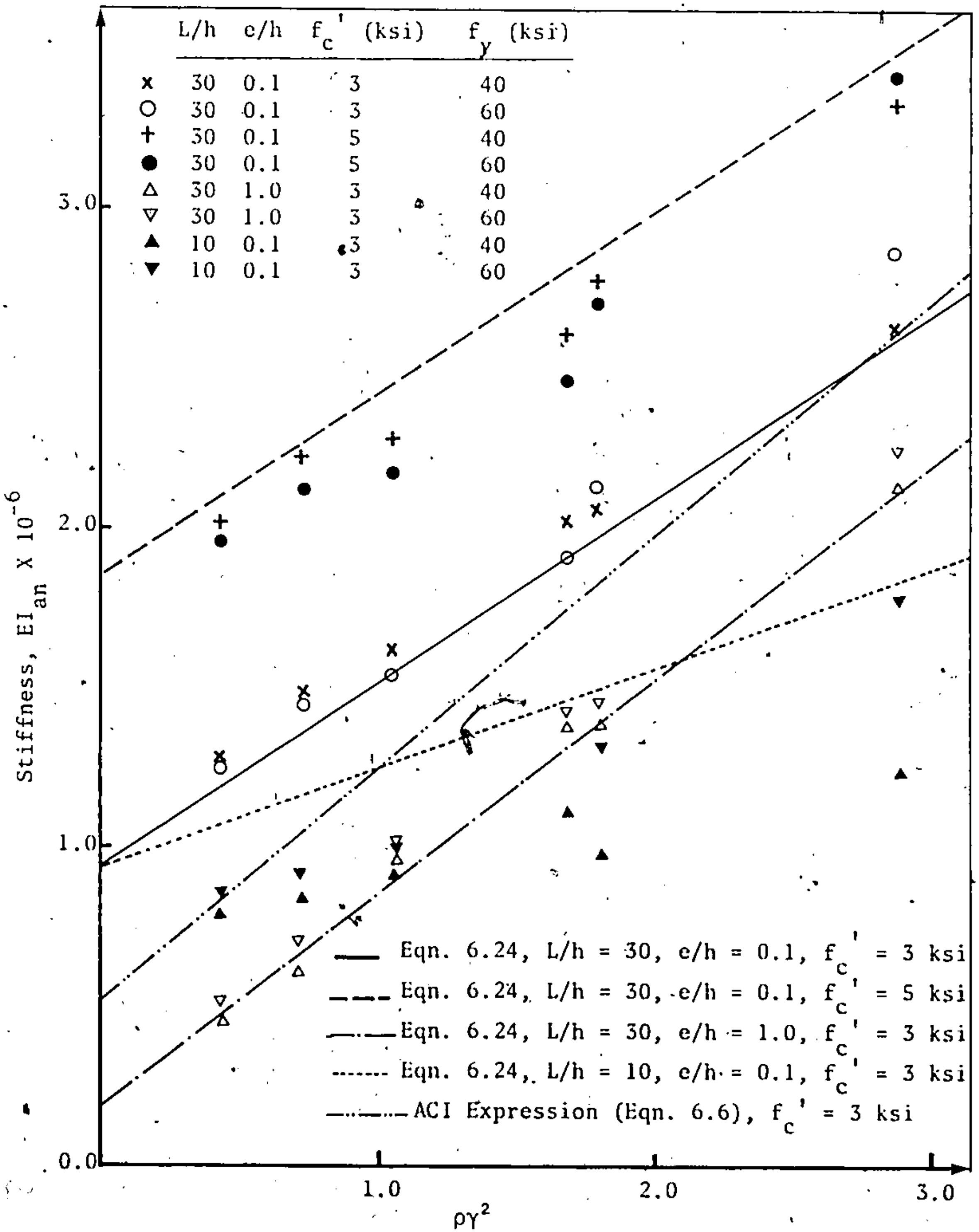

Fig. 6.4 EI_{an} VERSUS $\rho\gamma^2$ FOR DIFFERENT COMBINATIONS OF L/h AND e/h

In order to find a relationship between C_c and C_s and the parameters L/h and e/h, the values of EI_{an} were plotted against $\rho\gamma^2$ for each value of f_c', f_y, L/h, and e/h for e_1/e_2 equal to 1.0 and P_{sus}/P_{an} equal to 0.0.

The relationships between these values of EI_{an} and $\rho\gamma^2$ for the combinations of f_c', L/h, and e/h were then approximated by a series of straight lines similar to Fig. 6.4. These lines were chosen so that the values of EI_{an} would not be overestimated by more than approximately 6%. The values of C_c and C_s were found from the intercept and the slope of these lines.

Figure 6.5 shows the relationships between the values of C_c and C_s and L/h and e/h. These relationships are based on all the cases with P_{sus}/P_{an} equal to 0.0 and e_1/e_2 equal to 1.0. It is seen that the value of C_c decreases significantly as e/h increases. It is not significantly affected by L/h. The value of C_s, on the other hand, increases as e/h increases and is significantly increased by increases in L/h.

In finding an expression to account for these relationships, it was recognized that errors in EI_{an} would have a greater effect in predicting the capacities for columns of higher slenderness than for columns with lower slenderness. Therefore, an expression for EI_{an} should be biased towards the relationship at high slenderness.

As shown in Fig. 6.5, the relationships can be approximated by

$$C_c = \left(\frac{1}{1 + 12\ e/h}\right) 0.69 \times 10^6 \qquad \ldots. (6.22)$$

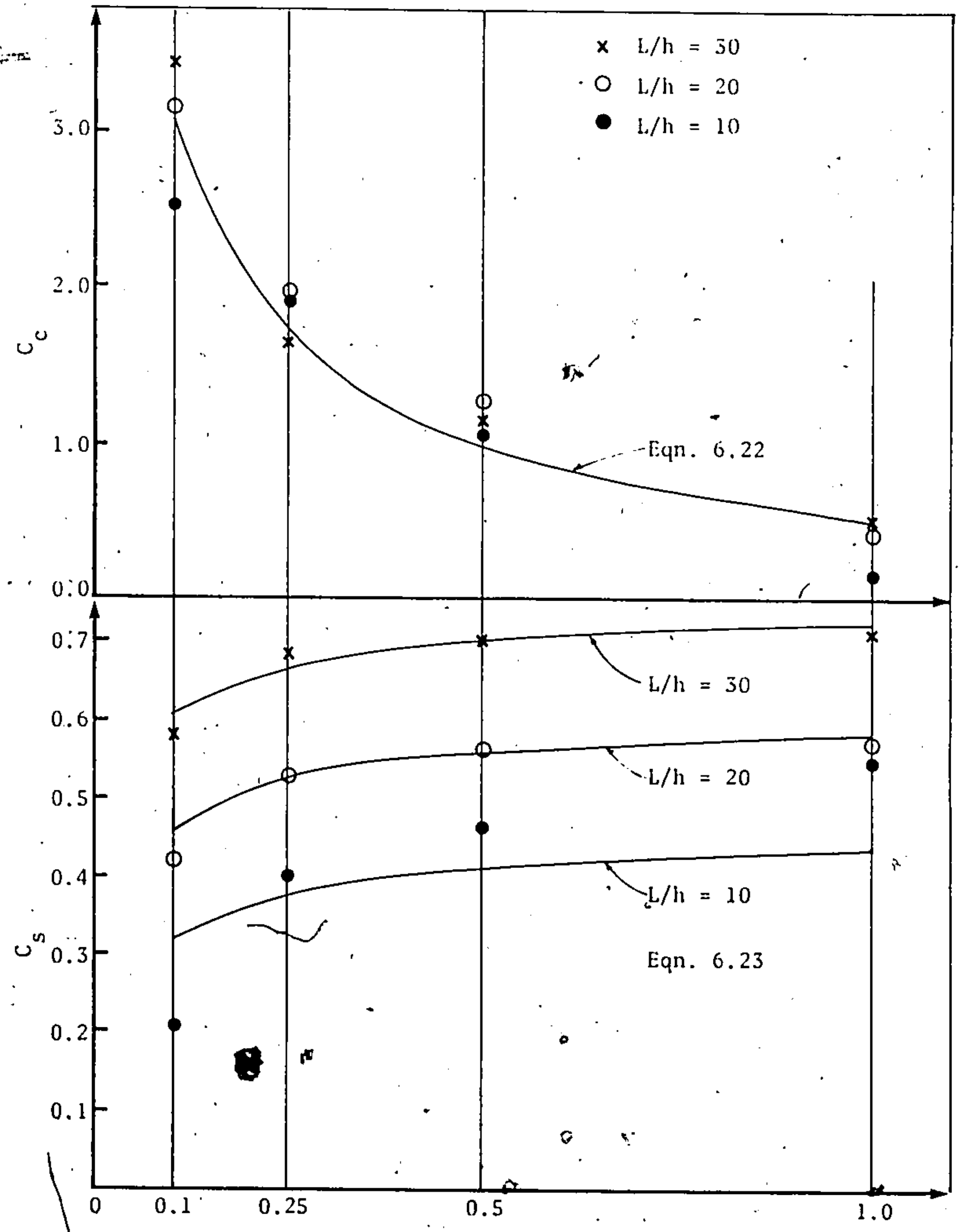

Fig. 6.5 STIFFNESS COEFFICIENTS C_c & C_s VERSUS e/h

$$\text{and } C_s = [1.03 - \frac{0.44}{1 + 12\ e/h} - 0.02\ (30 - L/h)] \times 0.725 \times 10^6 \qquad \ldots.\ (6.23)$$

Therefore, for short-term loading with symmetric end moments, the value of EI_{an} can be approximated by

$$EI_{an} = (\frac{1}{1 + 12\ e/h})\ 0.69 \times 10^6\ f_c' + \{1.03 - \frac{0.44}{1 + 12\ e/h} - 0.02\ (30 - L/h)\}\ 0.725 \times 10^6\ \rho\gamma^2 \qquad \ldots.\ (6.24)$$

Equation 6.24 is limited to columns with 10 in. X 10 in. cross sections. A more general equation results by expressing EI_{an} in terms of the gross cross section moment of inertia, I_g, and the moment of inertia of the steel about the centroid of the section, I_s. This becomes

$$EI_{an} = (\frac{1}{1 + 12\ e/h})\ I_g\ E_c + \{1.03 - \frac{0.44}{1 + 12\ e/h} - 0.02\ (30 - L/h)\}\ I_s\ E_s \qquad \ldots.\ (6.25)$$

where $E_c = 830\ f_c'$.

Equation 6.25 differs from the ACI equation (Eqn. 6.6) in that EI_{an} depends on L/h and e/h and that the value of E_c is proportional to f_c' rather than $\sqrt{f_c'}$. Since the shape of the normalized stress - strain relationship for concrete used in the analytical method was assumed to be independent of f_c', it follows that E_c would be linearly proportional to f_c'.

A similar study was made to obtain values of C_c and C_s for P_{sus}/P_{an} equal to 0.8. These values were then compared with those given by Eqns. 6.22 and 6.23 in order to find a relationship which would account for cases of sustained loading. It was found that the values of C_c and C_s for P_{sus}/P_{an} equal to 0.8 could be approximated with adequate accuracy by multiplying the value of C_c from Eqn. 6.22 by 0.55 and by subtracting 0.18×10^6 from the value of C_s given by Eqn. 6.23. The values of EI_{an} for P_{sus}/P_{an} equal to 0.8 can then be expressed, by combining the above expressions with Eqn. 6.24, to give

$$EI_{an(P_{sus}/P_{an} = 0.8)} = \left(\frac{1}{1 + 12\ e/h}\right) 0.69 \times 10^6\ f_c{}' \times 0.55$$

$$+ \left[1.03 - \frac{0.44}{1 + 12\ e/h} - 0.02\ (30 - L/h) - 0.25\right] \times 0.725 \times 10^6 \qquad \ldots. (6.26)$$

Assuming a linear relationship between C_c and C_s and P_{sus}/P_{an}, the general expression for C_c and C_s for any value of P_{sus}/P_{an} between 0.0 and 0.8 follows from Eqn. 6.26

$$EI_{an} = \left(\frac{1}{1 + 12\ e/h}\right) 0.69 \times 10^6\ f_c{}' \times (1 - .56\ P_{sus}/P_{an})$$

$$+ \left[1.03 - \frac{0.44}{1 + 12\ e/h} - 0.02\ (30 - L/h) - .31\ P_{sus}/P_{an}\right]$$

$$\times 0.725 \times 10^6 \qquad \ldots. (6.27)$$

It was recognized that the decrease in C_c and C_s is not really linear with P_{sus}/P_{an}, due to gain in concrete strength with age. However, the assumption of a linear relationship does not result in significantly conservative errors.

Equation 6.27 can be rearranged to include other cross section sizes, in the same way as Eqn. 6.25 followed from Eqn. 6.24, to give

$$EI_{an} = \left(\frac{1}{1 + 12\ e/h}\right) I_g\ E_c\ (1 - 0.56\ P_{sus}/P_{an})$$

$$+ \{1.03 - \frac{0.44}{1 + 12\ e/h} - 0.02\ (30 - L/h) - 0.31\ P_{sus}/P_{an}\}\ I_s\ E_s \qquad \ldots.\ (6.28)$$

This equation accounts for the general effects of the section properties and L/h, e/h, and P_{sus}/P_{an}. The factors to account for L/h, e/h, and P_{sus}/P_{an} were chosen to be independent of each other in order to maintain simplicity. It is biased to give better accuracy in predicted EI_{an} for L/h equal to 30 since the predicted column capacity is sensitive to the value of EI_{an} at this slenderness. It was also developed with bias towards the conservative side in order to limit unsafe errors to approximately 10% in predicting column capacities.

Equation 6.28 is the simplest expression found which shows the desired accuracy in predicting values of EI_{an} for the analysis of slender columns with e_1/e_2 equal to 1.0. Cases with other values of e_1/e_2 have not been included in the derivation of Eqn. 6.28.

It can be expected that the end moment ratio would also have an effect on the value of EI_{an}. This relationship is complicated by the fact that the decrease in the parameter e_1/e_2 results in an increase in the column capacity and a decrease in the maximum moment acting on the column. Therefore, the value EI_{an} may be increased or decreased with changes in e_1/e_2. No simple expression was found to represent this phenomenon. It was found, however, that the use of

$$C_m = 0.6 - 0.4\ e_1/e_2 \qquad \text{.... (6.29)}$$

gave conservative results in predicting column capacities. It is noted that the restriction that C_m be greater than 0.4 was not required.

The tables in Appendix H give predicted column capacities using the basic moment magnification equation (6.1), Eqn. 6.29 to calculate C_m, Eqn. 6.28 to estimate EI, and the ACI Rectangular Stress Block without the capacity reduction factor. The errors involved in this method, based on a comparison with the predicted capacities of the analytical method (Eqn. 5.3) are also listed in these tables.

It can be seen that the errors range between -20% and +17% for columns with symmetric curvature. However, for the other cases of e_1/e_2 this error range increases to -18% to +63%.

The high negative errors occur for L/h equal to 10 and P_{sus}/P_{an} equal to 0.8. This indicates that Eqn. 6.29 does not accurately account for the effect that sustained load has in reducing the section stiffness at this slenderness. The effect of sustained load, however, is accurately simulated for columns with higher slenderness. Therefore the factor to account for the effect of sustained load in Eqn. 6.29 should be made dependent on L/h. The maximum conservative error for cases with double curvature is quite high. This is due to the fact that the effect of the parameter e_1/e_2

was not included in Eqn. 6.29. High conservative errors generally occur for cases with high L/h and low e/h. These errors could be reduced by introducing a factor to account for the effects of double curvature into Eqn. 6.29. This factor would have to depend on L/h and e/h.

An evaluation of Eqn. 6.29 may be made by comparing the range of errors above with that for the ACI Moment Magnifier Method. The latter method gave errors ranging from -25% to +53% for e_1/e_2 equal to 1.0 and a range between -23% and +77% for e_1/e_2 equal to -0.98. Therefore, Eqn. 6.29 decreases the maximum errors. A comparison of the tables in Appendix H with those in Appendix F indicates that errors are generally reduced by using Eqn. 6.29 to estimate stiffness.

A similar comparison between the errors associated with the predicted column capacities using Eqn. 6.29 with those associated with the proposed method involving the use of the graphs of Appendix D indicated that the proposed method is the more accurate when considering the average results over the entire study range.

As mentioned, the accuracy of Eqn. 6.29 in estimating section stiffness for use with the basic moment magnification equation (Eqn. 6.1) could be improved by further modifications. These modifications would greatly increase the complexity of the expression.

6.6 The Effect of Changing the Eccentricity of the Sustained Load

Up to now, in all cases of sustained loading, the load was sustained at the same end eccentricity as the corresponding load to failure. The ACI Moment Magnifier Method accounts for sustained loading effects by reducing the value of EI depending on the ratio of the sustained moment to the ultimate moment, β. It has been suggested(25,72) that this does not fully account for the weakening effect caused by a sustained axial load with a smaller eccentricity than the final short-term load to failure. This could be of great significance since many columns are subjected to the greatest load from unbalanced floor live loads and wind after a period of sustained load due to dead loads with relatively small eccentricities.

To study this topic, Column 13 was subjected to a sustained axial load of 83 kips (approximately 50% of the short-term capacity) with an eccentricity ratio of 0.01 and then loaded to failure with e/h equal to 0.1. This column has low values for the steel parameters and, therefore, should be expected to show the greatest effects under a sustained axial load. The slenderness ratio, L/h, was taken as 30 and the end moment ratio, e_1/e_2, was 1.0. The ultimate capacity was found to be only slightly less than short-term capacity as shown in Fig. 6.6.

Figure 6.6 also shows the relationships between sustained load and ultimate capacity for the column when the sustained load also had an eccentricity ratio of 0.1. In this case, a sustained load of 83 kips has a significant effect on capacity.

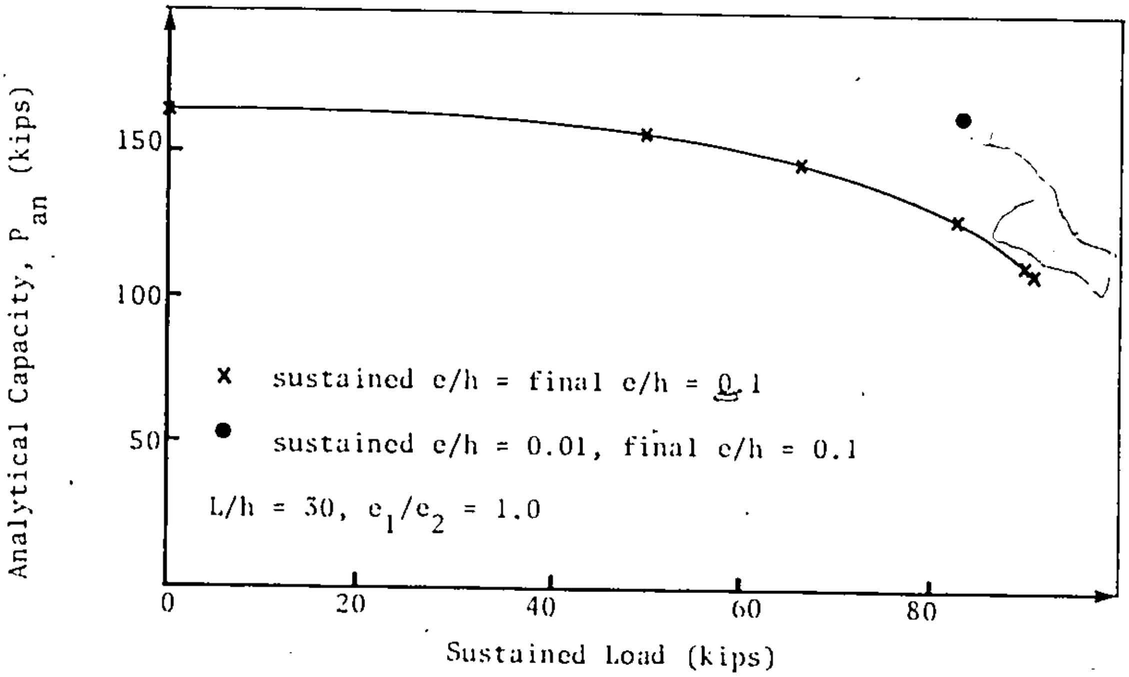

Fig. 6.6 EFFECT OF A SUSTAINED CONCENTRIC AXIAL LOAD

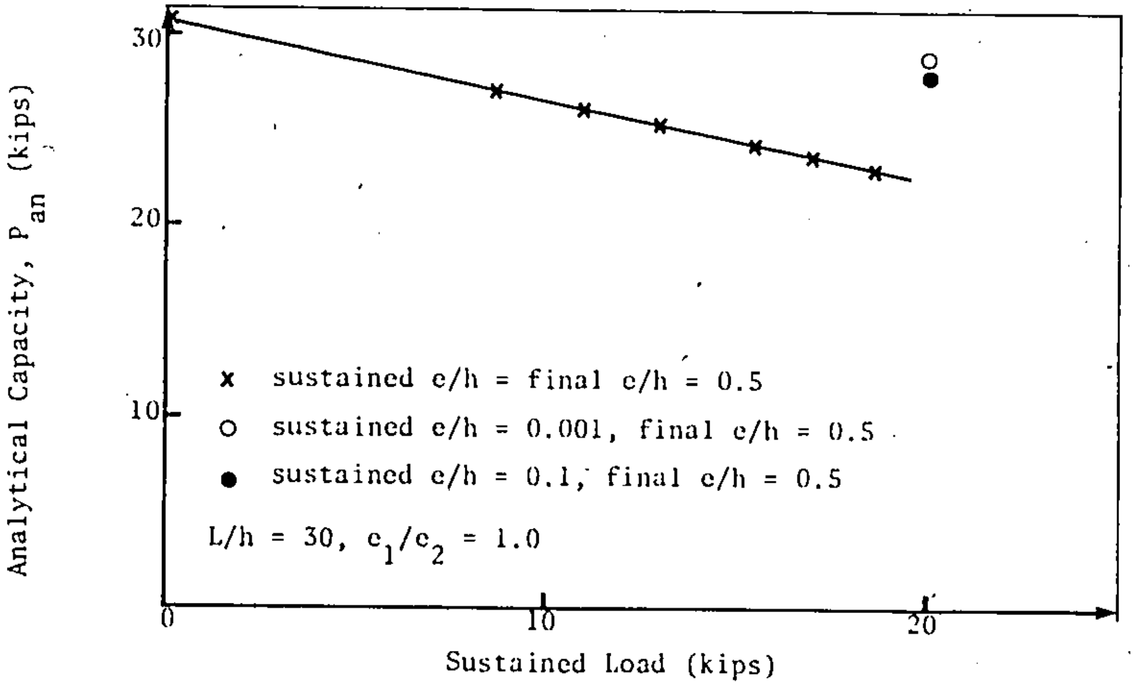

Fig. 6.7 EFFECT OF SUSTAINED LOAD WITH ECCENTRICITIES LESS THAN THE FINAL ECCENTRICITY

Therefore, if the effects of sustained loading are accounted for by the ratio of sustained load to ultimate load, significant conservatism will result for cases where the sustained load has a small eccentricity. If sustained load effects are accounted for by the ratio of sustained moment to ultimate moment, it would appear that only slightly unsafe errors occur.

This case, however, will not occur in practice since the sustained load must act at the minimum eccentricity ratio of 0.1.

Fig. 6.7 shows the results from two loading cases on Column 1 with different sustained and final eccentricities. The loading conditions were the same as those on Column 13, above, except that a load of 20 kips (approximately 65% of the short-term capacity) was sustained at eccentricity ratios of 0.001 and 0.1 and that the final load to failure had an eccentricity of 0.5. As indicated in Fig. 6.7, the sustained loads had very small effects.

Further study is needed on this topic but it would seem that the present practice of accounting of sustained load on the basis of moment ratios does not cause significant errors.

6.7 The Inclusion of the Capacity Reduction Factor

The inclusion of the Capacity Reduction Factor, ϕ, in the ACI Moment Magnifier equation (Eqn. 6.3) gives the impression that the ϕ factor is included twice in design. The ultimate capacity of a slender column, $\overline{P}_u$, assuming no section understrength due to construction or material imperfections can be found by ensuring that

$\overline{P}_u$ and $\overline{M}_u$ lie within the section interaction diagram for a section with no understrength where

$$\overline{M}_u = \frac{\overline{P}_u \quad e}{1 - \frac{\overline{P}_u}{P_c}} \qquad \text{.... (6.30)}$$

where P_c is the buckling load of the column with a section not reduced in strength.

The concept of the capacity reduction factor implies that the loss in capacity of a section due to imperfections may be accounted for by assuming that the interaction diagram for the section is defined by P_u and M_u where

$$P_u = \emptyset \, \overline{P}_u$$

and $$M_u = \emptyset \, \overline{M}_u$$

For these loads, Eqn. 6.1 becomes

$$M_u = \frac{P_u \quad e}{1 - \frac{P_u}{P_c}} \qquad \text{.... (6.31)}$$

However, it can be expected that the section imperfections which cause understrength will tend to reduce the EI of the section and therefore will reduce the buckling load P_c. If it is assumed that the stiffness is reduced to the same degree as the capacity, the value of P_c of the understrength section would be equal to $\emptyset \, P_c$.

The moment magnification equation to account for section understrength would then be

$$M_u = \frac{P_u \quad e}{1 - \frac{P_u}{\emptyset \, P_c}} \qquad \text{.... (6.32)}$$

which is the equation of the ACI Moment Magnifier Method (Eqns. 6.2 & 6.3).

Therefore, it can be inferred that the inclusion of ϕ in the moment magnification equation is correct provided the assumption that the section stiffness is reduced to the same extent as the capacity is correct.

To illustrate the validity of this assumption, a strength reduction of a column section was simulated by reducing the section properties. The section chosen, Section A, had a 10 in. X 10 in. cross section with ρ equal to 2.5%, f_c' equal to 4 ksi, f_y equal to 60 ksi, and γ equal to 0.75. An understrength of the strength for compression controlled cases was simulated by Section B with a 9.5 in. X 9.5 in. cross section, ρ equal to 2.375, γ equal to 0.74, f_y equal to 57 ksi, and f_c' equal to 2.7 ksi. An understrength in tension controlled cases was simulated by Section C with a 9.5 in. X 9.5 in. cross section, ρ equal to 2.375, f_c' equal to 4 ksi, f_y equal to 57 ksi, and γ equal to 0.58. These values were chosen to simulate the interaction diagram for Section A given by the ACI Rectangular Stress Block Method including a ϕ of 0.7. They do not necessarily represent reductions which might occur in practice.

The analytical section interaction diagrams for these sections are shown in Fig. 6.8. It is seen that the lower of the section capacities of Section B and C corresponds with the ACI interaction diagram for Section A with a ϕ of 0.7.

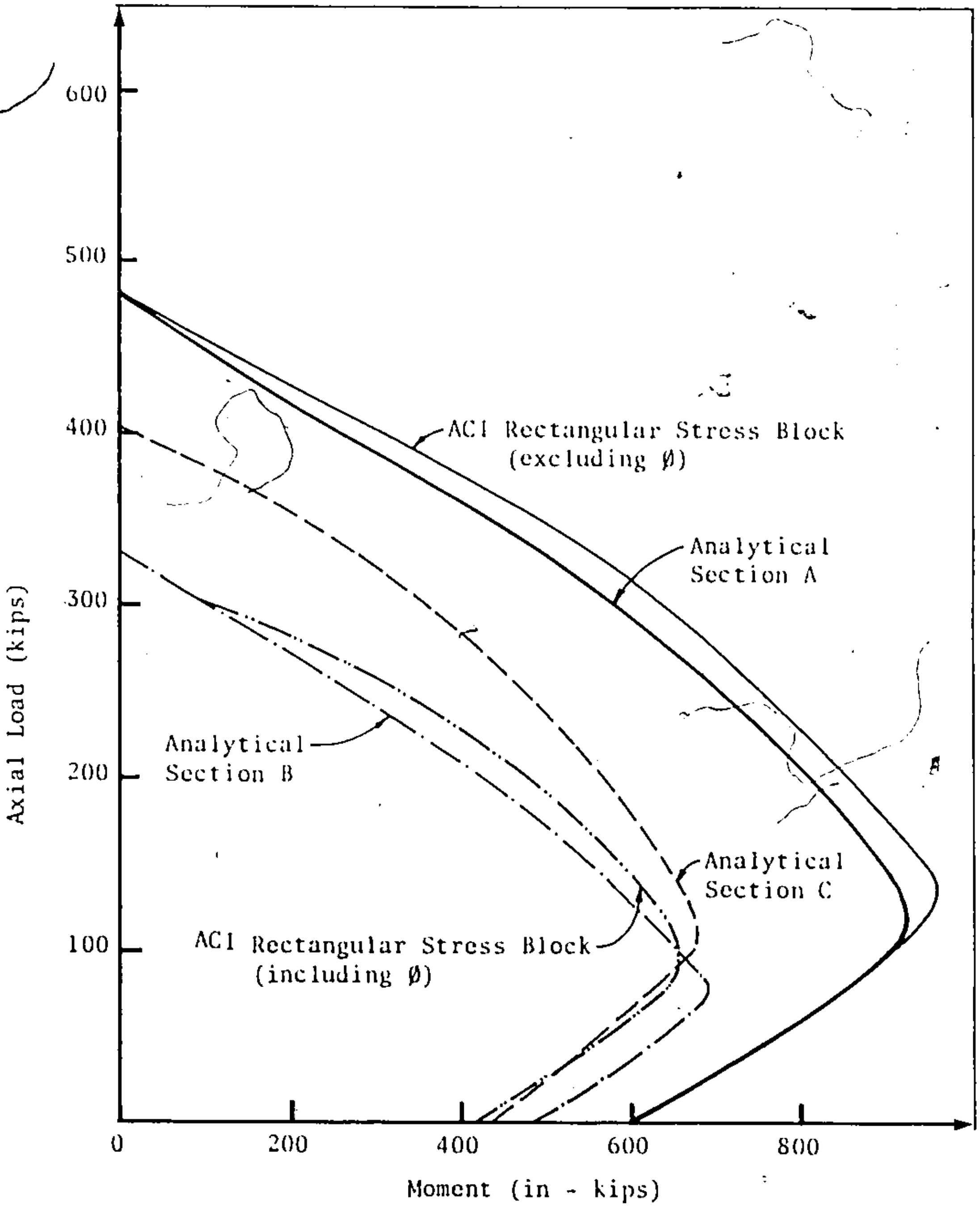

Fig. 6.8 INTERACTION DIAGRAMS OF ULTIMATE CAPACITY FOR UNDERSTRENGTH SECTIONS

Table 6.2 gives the short-term capacities for a column with these sections for L/h equal to 30 and e_1/e_2 equal to 1.0 predicted by the analytical method. The ultimate capacities of Section A as predicted by using the ACI Rectangular Stress Block, excluding and including the ∅ factors are also given in Table 6.2.

It may be noted that the capacities of the slender columns given by the ACI Moment Magnifier Method, including the ∅ factor of 0.7, are close to the smaller of the capacities of the slender columns predicted by the analytical method of Sections B and C for a specific eccentricity. For the slender column with an eccentricity of 1 in. the ACI Method, including ∅, underestimates the capacity compared to the analytical capacity for Section B. This is due to the inaccuracies inherent in the method rather than the use of a ∅ factor as can be seen by comparing the capacity predicted by the ACI Method, excluding ∅, with the analytical capacity predicted for Section A. The overestimation of the capacity of the slender column with an eccentricity equal to 1.0 in., as compared with the analytical capacity predicted for Section C, also corresponds with inaccuracies in the method rather than errors incurred by using a ∅ equal to 0.7. This is indicated by comparing the capacity predicted by the ACI Method, excluding ∅, with the capacity predicted by the analytical method for Section A.

Therefore, it appears that the inclusion of the ∅ factor in the moment magnification equation is correct.

TABLE 6.2 CAPACITIES OF COLUMNS WITH UNDERSTRENGTH SECTIONS

Column Length (in.)	Eccentricity (in.)	P_{an} Section "A" (kips)	P_{an} Section "B" (kips)	P_{an} Section "C" (kips)	P_{aci} Section "A" (Ø not included) (kips)	P_{aci} Section "A" (Ø included) (kips)
Short	1	372	258	322	385	269
Short	10	87	68	58	87	60.5
300	1	183	123	125	150	105
300	10	50.25	39.5	33.5	54	37

Note: Results for Short-Term Loading and Symmetric Curvature

It might be expected that the Ø factor should also be included in the direct moment magnification method discussed in Chapter 5. In this method, however, the moment magnification does not depend significantly on the section properties with the exception of the cross section depth. A decrease in section depth will give a higher value of L/h and, therefore, a higher value of moment magnification. It is believed, however, that the size of a constructed column does not differ significantly from that specified. Therefore, the Ø factor may be neglected in finding the moment magnification by this method. Naturally, the Ø factor must be included when estimating section capacity once the moment magnification has been found.

CHAPTER 7

CONCLUSIONS AND RECOMMENDATIONS

7.1 Summary of the Study

The main purpose of the study reported in this thesis was to evaluate design methods for slender reinforced concrete columns. In particular, the current ACI Moment Magnifier Method was studied in depth. The study was essentially limited to braced uniaxially loaded columns with rectangular cross sections. For these conditions, a simpler more accurate method of accounting for the effects of slenderness was developed and evaluated.

The study required knowledge of the behaviour of a large number of slender columns. This could only be found by using an analytical method in conjunction with a computer to predict column capacities. Because of the accuracy desired when evaluating design methods, the behaviour of concrete was an important consideration. The short-term behaviour of concrete in columns and its time dependent effects were studied by reviewing the available literature. An equation representing the nonlinear stress - strain relationship of concrete was developed on the basis of reported tests. The behaviour of the creep of concrete was simulated by using the CEB Creep Prediction Method(55) with a modification to account for creep at high strains and by using a creep superposition method proposed by Drysdale(23).

Because of the complex behaviour of reinforced concrete cross sections in slender columns, the analytical method involved the use of numerical procedures. Cross sections were divided into strips, the column length was divided into elements, and periods of sustained loading were simulated by a specific number of time intervals. An effort was made to select the appropriate numbers of these discrete elements which would give the minimum computation time corresponding to an acceptable degree of precision. Iteration techniques were used in finding the strain distribution of the cross sections and the equilibrium deflection profile of the column. The Newton-Raphson method as used by Sallam(72) was incorporated into the method as a convergence technique in finding strain distributions. Because of the large number of analytical results required, both iterative processes were accelerated as much as possible by using results at any stage in the solution as trial values in beginning the next iteration.

The analytical method was evaluated by studying its sensitivity to the various numerical procedures incorporated and by comparing its results with those from laboratory tests on slender columns. This indicated that the analytical method was sufficiently accurate to allow a meaningful evaluation of design procedures.

The concept of accounting for slenderness effects by magnifying the end moments was found to offer potential as a direct procedure in the design of slender columns. Because of the empirical nature of such a method, values of the moment magnification were required for columns with a large range of section properties and loading conditions. The main study was generally limited to rectangular cross sections with two layers of steel and with section properties within the range normally found in practice. This study allowed the development of a direct moment magnification method which involves the use of the graphs given in Appendix D to indicate the required moment magnifications. Because a prior knowledge of the steel percentage is not required in the procedure, the ease of use of the method as a design tool is a significant advantage. The method was shown to be sufficiently accurate for the design of slender columns within the range studied. It was extended to also include columns with cross sections with more than two layers of steel by applying a simple modification. The method is limited to columns with rectangular cross sections with section properties within the range normally found in practice as defined in Section 5.11. For these columns, this proposed method is easier to use and is usually more accurate than the present ACI Moment Magnifier Method.

A fairly comprehensive study of the ACI Moment Magnifier Method was made. It was shown that large conservative errors occur for columns with low steel percentages when the slenderness is high and the end eccentricity is low. These errors increase as the end moment ratio tends towards antisymmetric curvature and are greater for columns with sustained loads. It was shown that these errors are essentially the result of inaccuracies inherent in estimating the stiffness of a cross section without consideration of the axial load or moment on the column. An expression for stiffness, dependent on the section properties, the end eccentricity, the slenderness of the column, and the ratio of sustained load to ultimate load, was developed. This gave better results compared to the present ACI Moment Magnifier Method. However, its accuracy is not as good as the proposed direct moment magnification method. Modifications which would improve its accuracy would result in a method too difficult for design use.

A brief study was made of the effect of sustained loads with eccentricities smaller than those associated with the final failure loads. This indicated that the present practice of accounting for the effects of sustained load, by using the ratio of sustained moment to ultimate moment, seems to be sufficiently accurate.

An analysis of slender columns with reduced cross section properties to simulate section understrength was made. This indicated that the inclusion of the capacity reduction factor in the equation of the ACI Moment Magnifier Method is correct.

7.2 Design Recommendations

The design of braced, uniaxially loaded slender reinforced concrete columns with rectangular cross sections may be simplified by using the direct moment magnification method proposed in Chapter 5.

This method allows the prediction of column capacities by multiplying the end moment acting on the column by a moment magnification. The value of moment magnification may be found by using the graphs in Appendix D and by applying a modification for slender columns with more than two layers of reinforcing steel. Because the moment magnifications are independent of the steel percentage, this method is a useful design tool.

The range of moment magnifications for specific values of slenderness are shown in the graphs in Appendix D. Each graph is for a particular value of end moment ratio and sustained load ratio. The use of the upper limits of these ranges will result in safe design. Values of moment magnification for intermediate values of slenderness, end moment ratio, and sustained load ratio may be found by linear interpolation. Alternatively, the values of moment magnification for intermediate values of the sustained load ratio may be found by using the graph of the nearest sustained load ratio without a significant loss in accuracy. A modification for columns with more than two layers of steel must be made as described in Section 5.10. For cases where a load is sustained at an eccentricity different from the final failure load, the ratio of sustained moment to ultimate moment should be substituted for the ratio of sustained load to ultimate load.

7.3 Recommendations for Further Research

It is believed that the direct moment magnification method proposed in this thesis could be made applicable to columns with circular cross sections by the inclusion of an additional factor. Further research is required to investigate this possibility.

The effect of the ratio of the distance between steel layers has been indicated throughout this report. Generally, a decrease in this ratio increases the moment magnification. For this reason, columns with values for this ratio less than 0.65 had to be modified to give safe results. It is expected that the accuracy of the proposed method could be generally increased by incorporating the ratio between the steel layers into the basic method for all values of the ratio. This would involve either a modifying equation or further graphs and necessitates further study for cross sections with low values of the ratio. Furthermore, more cases of columns with intermediate steel should be studied to substantiate and perhaps improve the concept of reducing these cases to equivalent sections with two layers of steel.

Further research is required to investigate the effects that column imperfections have in reducing the capacity of slender columns.

Further study is also required to substantiate the validity of ignoring the effects of sustained concentric axial loads.

APPENDIX A

A STUDY OF THE STRENGTH OF CONCRETE IN OVER-REINFORCED BEAMS AND COLUMNS AS COMPARED WITH CYLINDERS

A.1 Introduction

As discussed in Chapter 2, there are many reasons to expect that the strength of concrete in reinforced beams and columns might differ from that indicated by standard 6 in. diameter concrete cylinders.

It is believed that the most significant of these reasons are the factors resulting from the differences in the placement of concrete in structural members and in standard cylinders. The degree of concrete compaction may vary between members and cylinders due to the presence of reinforcing steel. It is also believed that concrete strength variations occur due to the migration of water to the top casting face(40). This may have a significant effect on the contribution of concrete to the strength of a member, especially if it is tested in such an orientation that the top casting face becomes the compression face.

Other factors which might lead to a difference between the strength of concrete in members and cylinders include the differences in end restraint, size effects, and the shape of the specimen. The concrete strength of cylinders has been found to be dependent on their size(55). A difference between the strength indicated by cylinders and cubes has been reported(55).

An indication of the typical differences of concrete strength between members and cylinders may be obtained from a study of reported tests of over-reinforced beams and columns.

A.2 Over-Reinforced Beam Tests

The theoretical solution of the capacity of over-reinforced beams described in this section is similar to the solution for under-reinforced beams presented by others(44,46,77).

The following assumptions and restrictions are made:

1. Bernoulli's Hypothesis of a linear strain distribution is used.
2. The tensile strength of concrete is ignored.
3. Concrete stress is assumed to be a unique function of concrete strain.
4. It is assumed that no slip occurs between the steel and the concrete.
5. The steel stress is given by multiplying the steel strain by the modulus of elasticity of the steel, E_s.
6. The solution is restricted to rectangular sections with one layer of steel.

The relationship between concrete stress and strain may be expressed by

$$f_c = k_3 f_c' f_n(\varepsilon_c) \qquad \dots . \text{(A.1)}$$

where f_c' is the concrete strength indicated by cylinder tests

k_3 is a factor to correlate the maximum concrete stress in a member to that indicated by cylinder tests

$f_n(\varepsilon_c)$ is a function of strain.

The following terms are defined as

$$F_1 = f_n(\varepsilon_c')$$

$$F_2 = \frac{1}{\varepsilon_c'} \int_0^{\varepsilon_c'} f_n(\varepsilon_c') \, \partial(\varepsilon_c')$$

$$F_3 = \frac{1}{(\varepsilon_c')^2} \int_0^{\varepsilon_c'} f_n(\varepsilon_c') \, \varepsilon_c' \, \partial(\varepsilon_c')$$

where ε_c' is the concrete strain at the extreme compression fibre.

Other symbols are defined in Fig. A.1.

The concrete compressive force is given by

$$C = b \, k_3 \, f_c' \int_0^a f_n(\varepsilon_c) \, \partial(\varepsilon_c \frac{a}{\varepsilon_c'})$$

$$= b \, k_3 \, f_c' \, \frac{a}{\varepsilon_c'} \int_0^{\varepsilon_c'} f_n(\varepsilon_c) \, \partial(\varepsilon_c)$$

$$= b \, k_3 \, f_c' \, a \, F_2 \qquad \text{.... (A.2)}$$

The steel strain can be expressed in terms of the maximum concrete strain, ε_c', by

$$\varepsilon_s = (\frac{d' - a}{a}) \, \varepsilon_c' \qquad \text{.... (A.3)}$$

The tensile force in the steel can then be expressed as

$$T = A_s \, E_s \, (\frac{d' - a}{a}) \, \varepsilon_c' \qquad \text{.... (A.4)}$$

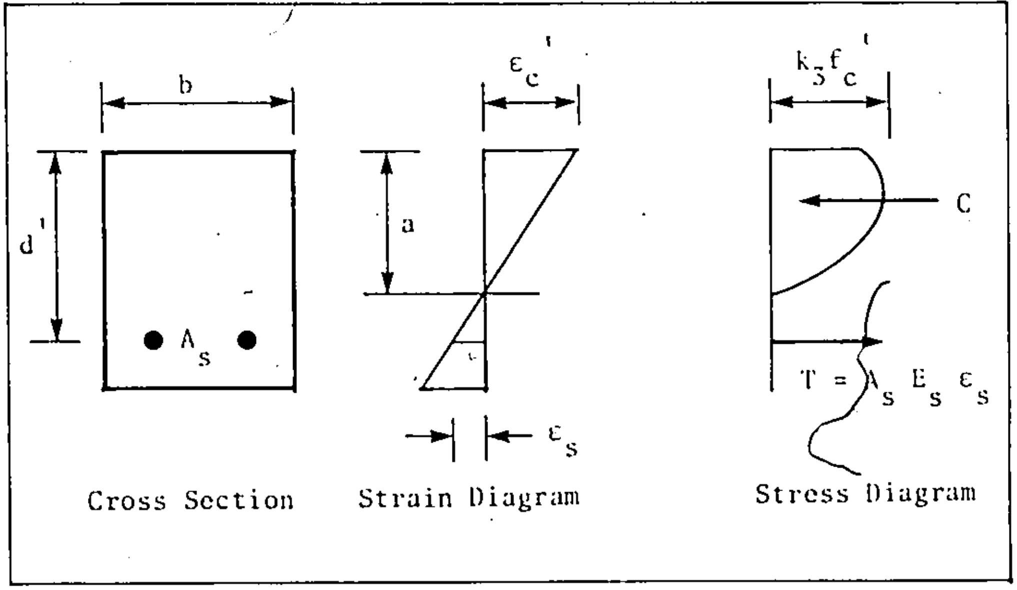

Fig. A.1 SECTION FOR OVER-REINFORCED BEAM THEORY

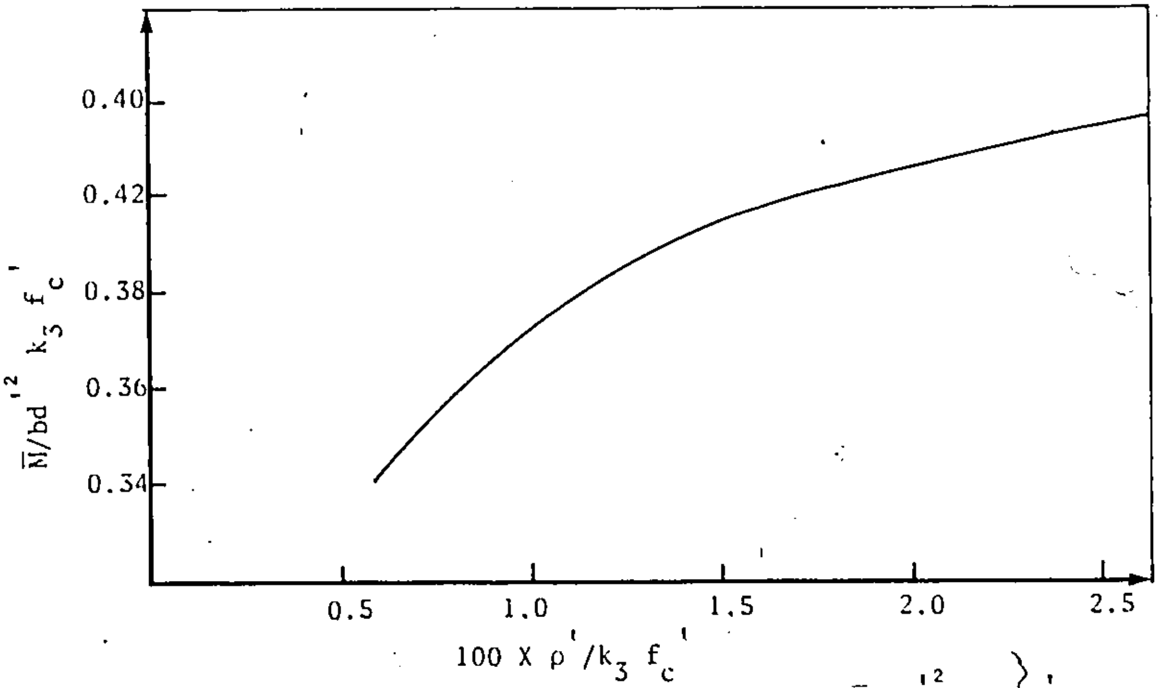

Fig. A.2 THEORETICAL RELATIONSHIP BETWEEN $\overline{M}/bd'^2\ k_3\ f_c'$ AND $\rho'/k_3\ f_c'$ FOR OVER-REINFORCED BEAMS

Since T is equal to C for beams without axial load, Eqns. A.2 and A.4 give

$$\rho' E_s \varepsilon_c' (1 - a/d') = k_3 f_c' (a/d')^2 F_2 \qquad \ldots. \text{(A.5)}$$

where $\rho' = A_s/bd'$

Eqn. A.5 can be further reduced to

$$(a/d')^2 F_2 + (a/d') \alpha \varepsilon_c' - \alpha \varepsilon_c' = 0 \qquad \ldots. \text{(A.6)}$$

where $\alpha = \dfrac{\rho' E_s}{k_3 f_c'}$

The internal moment resulting from the strain distribution of Fig. A.1 is given by

$$\begin{aligned} M &= C\,(d' - a) \\ &\quad + b\,k_3\,f_c' \int_o^a f_n(\varepsilon_c)\,\varepsilon_c \frac{a}{\varepsilon_c'}\,\partial(\varepsilon_c \frac{a}{\varepsilon_c'}) \\ &= b\,k_3\,f_c'\,a\,F_2\,(d' - a) + b\,k_3\,f_c'\,a^2\,F_3 \qquad \ldots. \text{(A.7)} \end{aligned}$$

This implies that

$$\frac{M}{b\,d'^2\,k_3\,f_c'} = (a/d')\,F_2 - (\frac{a}{d'})^2\,F_2 + (a/d')^2\,F_3 \qquad \ldots. \text{(A.8)}$$

It is noted that Eqn. A.6 indicates that (a/d') is a function of the stress function, the value ε_c', and the parameter α. Equation A.8 indicates $\dfrac{M}{b\,d'^2\,k_3\,f_c'}$ is a function of (a/d'), the stress function, and the value ε_c'. Therefore, $\dfrac{M}{b\,d'^2\,k_3\,f_c'}$ is a function of the stress function, the value ε_c' and the parameter α.

For a given stress function and α, the maximum moment may be found by a trial and error technique. A trial value of ε_c' will give a value of (a/d') from Eqn. A.6 and a value for $\frac{M}{b\,d'^2\,k_3\,f_c'}$ can then be found from Eqn. A.8. The maximum value of $\frac{M}{b\,d'^2\,k_3\,f_c'}$ is found by increasing ε_c' until the value begins to decrease.

Figure A.2 shows the relationship between this value $\frac{\overline{M}}{b\,d'^2\,k_3\,f_c'}$ and $\rho/k_3\,f_c'$. These were derived by using the concrete stress - strain relationship presented in Chapter 2 (Eqn. 2.5).

The value of k_3 may be found from this relationship if the value of $\frac{\overline{M}}{b\,d'^2\,k_3\,f_c'}$ and ρ/f_c' are known.

Over-reinforced beam tests have been reported by Cox(21), Lash & Brison(45), Slater & Lyse(75), and Smith & Young(76). These tests were used to estimate k_3 by following the above procedure. The beam properties as well as these values of k_3 are given in Table A.1.

Figure A.3 shows the relationship between the value of k_3 and the concrete cylinder strength f_c' for these tests. It is seen that k_3 decreases as concrete strength increases. An average value of k_3 for 4 ksi concrete is 0.8.

A.3 Short - Column Tests

Hognestad(40) has reported results of tests on 72 eccentric short columns with 10 in. square cross sections. The area of the reinforcing steel and its position and yield strength are given in

TABLE A.1 ESTIMATE OF THE k_3 FACTOR FROM OVER-REINFORCED BEAM TESTS

Reference	Beam Ref.	Number of Tests	d' (in.)	b (in.)	f_y (ksi)	f_c' (ksi)	ρ' (X 100%)	ρ'/f_c'	$\frac{M_n}{b\,d^2\,f_c'}$	k_3	Comments
Lash & Brison(45)	4205	1	2.45	2.04	39.2	1.87	4.00	2.14	0.471	1.17	Plain bars with surface roughened by rusting
	4206	1	2.49	2.03	44.4	1.83	4.75	2.59	0.487	1.19	
	6203	1	2.69	2.01	88.0	2.04	1.40	0.69	0.352	1.01	
	6204	1	2.60	2.03	75.8	2.04	2.00	0.98	0.349	0.93	
	6205	1	2.46	2.06	75.8	1.85	2.25	1.22	0.439	1.17	
	6206	1	2.58	2.04	73.5	1.98	2.84	1.44	0.421	1.08	
	6207	1	2.50	2.02	75.2	1.82	3.85	2.12	0.411	1.00	Cylinders were 4 in. X 8 in. f_c', taken as 0.95 f_c' cylinder
	6208	1	2.45	2.02	75.2	2.01	3.91	1.94	0.428	1.06	
	4308	1	2.47	2.02	42.8	3.16	4.54	1.44	0.382	0.97	
	6304	1	2.45	2.00	75.8	2.62	2.33	1.44	0.365	0.99	
	6305	1	2.60	2.01	74.0	3.04	2.86	0.89	0.356	0.96	
	6306	1	2.47	2.00	75.2	2.62	3.94	0.94	0.378	0.95	
	6404	1	2.40	2.10	75.8	4.27	2.26	1.53	0.277	0.79	
	6405	1	2.58	2.06	74.0	3.93	2.80	0.71	0.311	0.86	
	6406	1	2.47	2.01	75.2	3.98	3.90	0.98	0.355	0.88	
	6407	1	2.47	2.00	62.1	3.98	4.08	1.03	0.359	0.95	
	6504	1	2.43	2.01	75.8	4.63	2.33	0.50	0.262	0.75	
	6505	1	2.64	1.99	65.0	4.23	3.71	0.88	0.316	0.84	
	6506	1	2.48	2.01	75.8	5.18	4.58	0.89	0.308	0.81	

continued ....

TABLE A.1 ESTIMATE OF THE k_3 FACTOR FROM OVER-REINFORCED BEAM TESTS (Cont'd)

Reference	Beam Ref.	Number of Tests	d' (in.)	b (in.)	f_y (ksi)	f_c' (ksi)	ρ' (X 100%)	ρ'/f_c'	$\frac{M_n}{b\ d^2\ f_c'}$	k_3	Comments
$Cox^{(21)}$	123	1	5.0	5.0	53.4	1.87	2.64	1.42	0.383	0.97	deformed bars 6 in. X 12 in. cylinders
	124	1	5.0	5.0	53.4	1.87	3.52	1.89	0.412	1.02	
	125	1	5.0	5.0	53.4	1.87	4.40	2.36	0.426	1.03	
	142	1	5.0	5.0	48.1	1.87	2.44	1.31	0.400	1.04	
	143	1	5.0	5.0	48.1	1.87	3.68	1.97	0.385	0.94	
	144	1	5.0	5.0	48.1	1.87	4.88	2.62	0.444	1.07	
	224	3	5.0	5.0	53.4	3.03	3.52	1.16	0.349	0.90	
	225	3	5.0	5.0	53.4	3.03	4.40	1.45	0.360	0.91	
	243	3	5.0	5.0	48.1	3.03	3.68	1.22	0.377	0.98	
	244	3	5.0	5.0	48.1	3.03	4.88	1.61	0.382	0.96	
	214	3	5.0	5.0	55.2	3.03	3.08	1.02	0.381	1.02	
	215	3	5.0	5.0	55.2	3.03	3.88	1.28	0.379	0.98	
	234	3	5.0	5.0	48.1	3.03	3.08	1.02	0.355	0.94	
	235	3	5.0	5.0	48.1	3.03	3.88	1.28	0.388	1.00	
	252	3	5.0	5.0	50.6	3.03	3.48	1.15	0.386	1.01	
	253	3	5.0	5.0	50.6	3.03	5.20	1.72	0.396	0.99	
	324	1	5.0	5.0	53.4	4.65	3.52	0.76	0.284	0.76	
	325	1	5.0	5.0	53.4	4.65	4.40	0.95	0.309	0.81	
	343	1	5.0	5.0	48.1	4.65	3.68	0.79	0.286	0.76	
	344	1	5.0	5.0	48.1	4.65	4.88	1.05	0.330	0.86	
	425	1	5.0	5.0	53.4	5.58	4.40	0.79	0.304	0.62	
	444	1	5.0	5.0	53.4	5.58	4.88	0.88	0.311	0.83	

continued ....

TABLE A.1 ESTIMATION OF THE k_3 FACTOR FROM OVER-REINFORCED BEAM TESTS (Cont'd)

Reference	Beam Ref.	Number of Tests	d' (in.)	b (in.)	f_y (ksi)	f_c' (ksi)	ρ' (X 100%)	ρ'/f_c'	$\frac{M_n}{b\ d^2\ f_c'}$	k_3	Comments
Slater and Lyse(75)	1	3	10.2	8.2	63.0	1.39	2.12	1.52	0.494	1.29	6 in. X 12 in. cylinders
	2	3	10.3	8.2	63.0	2.79	2.81	1.01	0.332	0.87	
	3	3	10.3	8.2	59.3	4.07	3.72	0.91	0.322	0.85	
	4	3	10.1	8.2	59.3	4.80	4.73	0.99	0.335	0.88	
	5	3	10.2	8.3	59.3	5.74	5.56	0.97	0.317	0.83	
	6	2	14.2	8.2	61.2	2.59	2.96	1.14	0.417	1.11	
	6A	3	14.1	8.2	61.2	4.13	3.92	0.95	0.324	0.85	
	7	3	12.2	8.3	63.0	2.95	2.81	0.95	0.337	0.89	
	8	2	8.0	8.1	61.1	2.76	3.07	1.13	0.372	0.98	
	9	3	5.9	7.9	63.0	2.90	3.18	1.10	0.380	1.00	
	10	3	4.1	8.0	68.2	2.82	3.02	1.07	0.327	0.85	
	10A	3	4.1	8.0	68.2	3.81	4.05	1.06	0.340	0.89	
Smith and Young(26)	D	1	6.0	4.0	54.0	2.56	3.18	1.24	0.42	1.11	6 in. X 12 in. cylinders
	G	1	6.0	4.0	54.0	2.23	2.20	0.99	0.37	1.00	

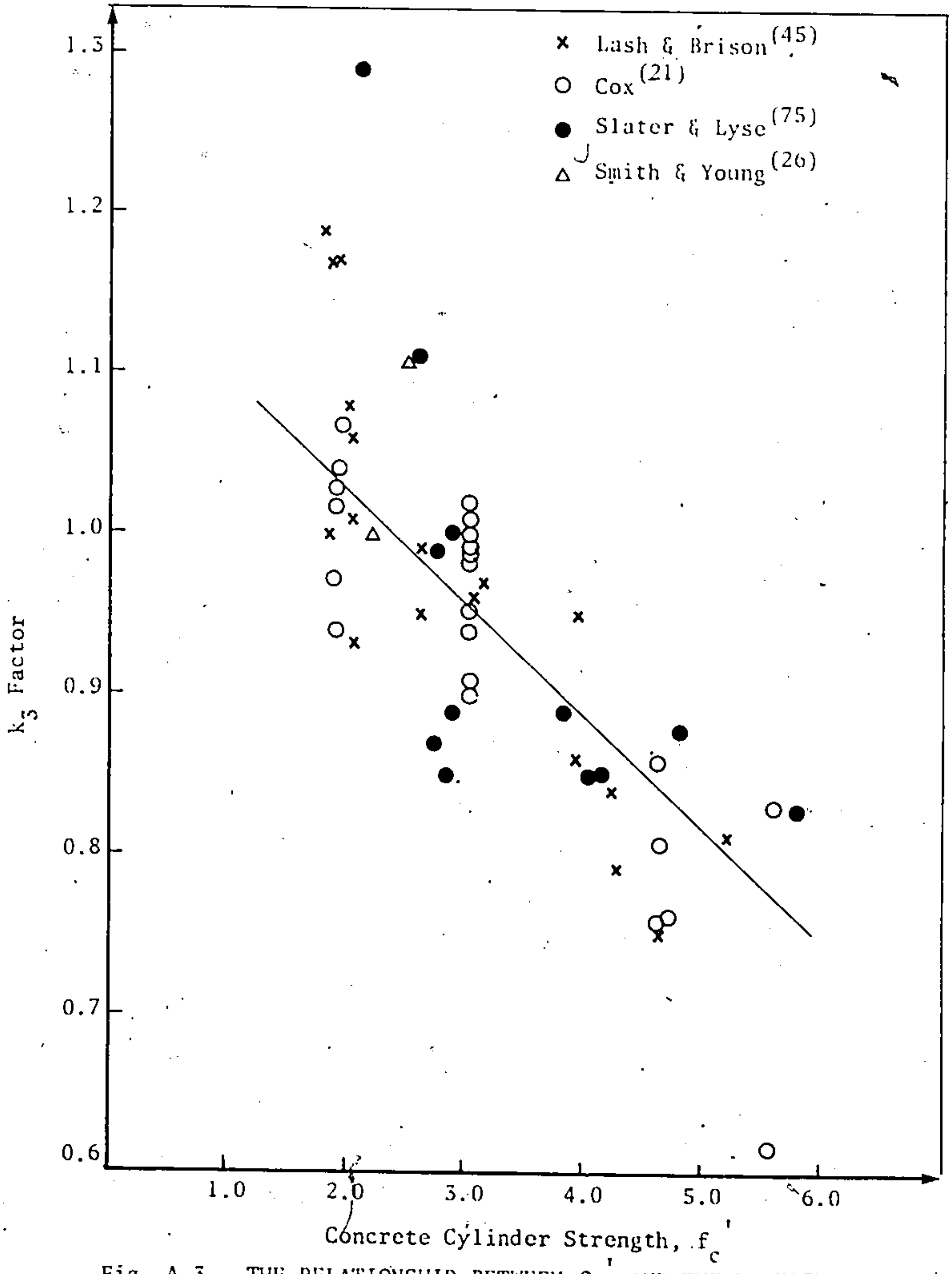

Fig. A.3 THE RELATIONSHIP BETWEEN f_c' AND THE k_3 FACTOR FROM OVER-REINFORCED BEAM TESTS

Tables A.2 to A.4. The columns were vertically cast and vibrated. The height of the columns was 75 in.

The capacities of these columns were predicted using the analytical method with a k_3 factor equal to 0.85. Tables A.2 to A.4 give the test and predicted capacities of these columns. Values of P_t/P_{an} ranged from 0.85 to 1.17 with an average for all the columns of 0.997. This indicates that the use of k_3 equal to 0.85 seems to be correct for vertically cast columns.

It is of interest to compare values of Pt/P_{an} for different levels of f_c'. The A series with the high concrete strengths had an average value of 0.968; the B series with the intermediate concrete strength had an average value of 1.001, whereas the C series with the low concrete strength had an average value of 1.025. This decrease in k_3 as f_c' increases is similar, but not as pronounced, as that found for the over-reinforced beams.

A.4 Summary

On this basis, it would seem that a k_3 factor of 0.85 should be used for vertically cast columns. The concrete strength of horizontally cast columns may be estimated as 0.9 times the cylinder strength as indicated by the over-reinforced beam tests.

TABLE A.2 COMPARISON OF ANALYTICAL RESULTS FOR k_3 EQUAL TO 0.85 WITH SHORT COLUMNS TESTS BY HOGNESTAD(40): GROUP I

Column Reference	f_c' (ksi)	e (in.)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
A 2a	5.28	2.5	239	236	1.01
A 2b	5.83	2.5	253	258	0.98
B 2a	4.25	2.5	213	196	1.09
B 2b	4.07	2.5	190	188	1.01
C 2a	2.27	2.5	118.5	114	1.04
C 2b	1.97	2.5	100	102	0.98
A 3a	5.66	5.0	133.5	153	0.87
A 3b	5.83	5.0	140	156	0.90
B 3a	4.63	5.0	125.9	135	0.93
B 3b	4.29	5.0	116	127	0.91
C 3a	1.88	5.0	60.5	66.5	0.91
C 3b	1.69	5.0	64	61.5	1.04
A 4a	4.81	7.5	84.5	87.5	0.97
A 4b	5.60	7.5	81	92	0.88
B 4a	3.80	7.5	80	80	1.00
B 4b	4.29	7.5	81	83.5	0.97
C 4a	1.69	7.5	50.5	46.5	1.09
C 4b	1.73	7.5	52	47.5	1.10
A 5a	4.81	12.5	48.2	45.3	1.07
A 5b	5.60	12.5	42.8	46.5	0.92
B 5a	4.29	12.5	46.1	44.5	1.04
B 5b	5.49	12.5	45.5	45	1.01
C 5a	2.31	12.5	39	37.8	1.03
C 5b	1.77	12.5	32.8	32.5	1.01

Note: tension steel: d = 1.2 in., A_s = 0.22 sq. in., f_y = 60.0 ksi

compression steel: d = 8.67 in., A_s = 1.24 sq. in., f_y = 43.6 ksi

TABLE A.3 COMPARISON OF ANALYTICAL RESULTS FOR k_3 EQUAL TO 0.85 WITH SHORT COLUMNS TESTS BY HOGNESTAD(40): GROUP II

Column Reference	f'_c (ksi)	e (in.)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
A 7a	5.24	3.25	229	236	0.97
A 7b	5.81	2.5	284	300	0.95
B 7a	4.08	2.5	256	232	1.10
B 7b	4.04	2.5	248	231	1.07
C 7a	1.97	2.5	141	148	0.95
C 7b	1.52	2.5	126.8	129	0.98
A 8a	5.52	5.0	162	172	0.94
A 8b	5.81	5.0	152	176	0.86
B 8a	4.70	5.0	156	160	0.98
B 8b	4.26	5.0	146	152	0.96
C 8a	1.82	5.0	99	95.5	1.04
C 8b	1.82	5.0	99	95.5	1.04
A 9a	5.10	7.5	89	96.5	0.92
A 9b	5.17	7.5	91.2	96.5	0.95
B 9a	4.70	7.5	94	95	0.99
B 9b	4.37	7.5	89.5	93.5	0.96
C 9a	1.83	7.5	73.0	73	1.00
C 9b	1.73	7.5	65.5	70.5	0.93
A 10a	5.10	12.5	46.1	46	1.00
A 10b	5.17	12.5	44	46.3	0.95
B 10a	4.26	12.5	43.5	45.5	0.96
B 10b	4.37	12.5	44	45.8	0.96
C 10a	2.30	12.5	44.5	43.5	1.02
C 10b	1.77	12.5	45	42.5	1.06

Note: tension steel: d = 1.33 in., A_s = 1.24 sq. in., f_y = 43.6 ksi

compression steel: d = 8.67 in., A_s = 1.24 sq. in., f_y = 43.6 ksi

TABLE A.4 COMPARISON OF ANALYTICAL RESULTS FOR k_3 EQUAL TO 0.85 WITH SHORT COLUMNS TESTS BY HOGNESTAD(40): GROUP III

Column Reference	f_c' (ksi)	e (in.)	P_t (kips)	P_{an} (kips)	P_t/P_{an}
A 12a	4.15	2.5	315	290	1.09
A 12b	5.05	2.5	325	326	1.00
B 12a	4.30	2.5	303	296	1.02
B 12b	4.01	2.5	284	285	1.00
C 12a	2.30	2.5	252	216	1.17
C 12b	2.20	2.5	230	212	1.09
A 13a	5.35	5.0	220	221	1.00
A 13b	4.85	5.0	210	210	1.00
B 13a	3.58	5.0	180	179	1.01
B 13b	4.29	5.0	206	196	1.05
C 13a	2.30	5.0	151	147	1.03
C 13b	2.07	5.0	137	141	0.97
A 14a	5.35	7.5	142	155	0.92
A 14b	5.10	7.5	153	153	1.00
B 14a	3.58	7.5	138.8	135	1.03
B 14b	4.59	7.5	*		
C 14a	1.95	7.5	115.5	105	1.10
C 14b	2.07	7.5	104	107	0.97
A 15a	5.10	12.5	88	81	1.09
A 15b	4.85	12.5	79	80.5	0.98
B 15a	3.80	12.5	74	79.5	0.93
B 15b	4.63	12.5	84.5	80.5	1.05
C 15a	1.95	12.5	72.5	71.5	1.01
C 15b	2.07	12.5	74.5	72.5	1.03

Note: tension steel: d = 1.5 in., A_s = 2.4 sq. in., f_y = 43.6 ksi

compression steel: d = 8.5 in., A_s = 2.4 sq. in., f_y = 43.6 ksi

*bond failure

APPENDIX B

LISTING OF ANALYTICAL METHOD PROGRAMME

The programme was written in the Fortran Extended Version 4 language for use on the CDC 6400 computer at McMaster University Computer Centre.

Refer to Chapter 3 for a discussion of the analytical method.

Refer to Fig. 3.2 for a flow chart of the programme.

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*M
C                            PROGRAM COL
C                                           WRITTEN BY M.D.WHELAN
C                                           AT MCMASTER UNIVERSITY
C                                           M.ENG. THESIS (1979)
C
C
C     DESCRIPTION
C                   INELASTIC SLENDER REINFORCED CONCRETE COLUMN ANALYSIS
C                   COLUMN UNIAXIALLY LOADED AND BRACED
C                   SHORT-TERM OR SUSTAINED LOADING
C                   CROSS SECTION RECTANGULAR,SYMMETRIC,AND CONSTANT
C                   THROUGHOUT COLUMN LENGTH
C                   INFINITELY STIFF END REGIONS MAY BE INCLUDED
C                   LOADS APPLIED AT BOTH ENDS ONLY - NEED NOT BE SYMMETR
C                   JOINT NO. IS BASE OF COLUMN
C                   FOR DESCRIPTION OF ANALYTICAL METHOD REFER TO
C                   CHAPTER 3 OF "DESIGN PROVISIONS FOR SLENDER CONCRETE
C                   BY M.D.WHELAN,M.ENG.THESIS,MCMASTER UNIVERSITY,(1979)
C

C     SIGN CONVENTION
C                   POSITIVE AXIAL FORCE - COMPRESSION
C                   POSITIVE BENDING MOMENT - COMPRESSION ON RIGHT SIDE
C                   POSITIVE STRAIN - SHORTENING
C                   POSITIVE CURVATURE - SHORTENING ON RIGHT SIDE
C                   POSITIVE HORIZONTAL DISPLACEMENT - TO RIGHT
C                   POSITIVE VERTICAL DISPLACEMENT - UPWARD
C                   POSITIVE ROTATION - CLOCKWISE
C
C
C     NOMENCLATURE
C     AGEN          AGE OF CONCRETE
C     AS            AREA OF OUTER STEEL
C     AL            LENGTH OF COLUMN ELEMENTS
C     ASES          AS X ES
C     ASFS          AS X FSY
C     ASM           AREA OF INNER STEEL
C     ASMES         ASM X ES
C     ASMFS         ASM X FSY
C     AST           TOTAL AREA OF STEEL
C     B             BREADTH OF CROSS SECTION
C     CA,CB         DEFINE CONCRETE STRENGTH GAIN WITH AGE
C     CFATL         CREEP FACTOR FOR AGE AT LOADING
C     CFS1          CREEP NONLINEARITY FACTOR
C     CINIT         CREEP STRAIN DUE TO INITIAL SHRINKAGE
C     CU            ULTIMATE CREEP FACTOR
C     CYLTL         CONCRETE CYLINDER STRENGTH AT TIME OF LOADING
C     CYL28         CONCRETE CYLINDER STRENGTH AT 28 DAYS
C     D             DEPTH OF CROSS SECTION
C     D1 TO D4      DISTANCE FORM CENTRE OF SECTION TO STEEL LAYER
C     DDL           THICKNESS OF EACH STRIP
C     DY            VERTICAL DEFLECTION AT JOINTS
C     EBL           LENGTH OF INFINITELY STIFF END REGIONS
C     ECC1,ECC2     ECCENTRICITIES AT CURRENT STAGE
C     EFIN1,EFIN2   ECCENTRICITIES FOR LOADING TO FAILURE
C     EN            EFFECTIVE CONCRETE STRAIN FOR NEXT INTERVAL
C     EOP           EFFECTIVE CONCRETE STRAIN AT CURRENT INTERVAL
C     ES            ELASTIC MODULUS OF STEEL
C     ESUS1,ESUS2   ECCENTRICITIES OF SUSTAINED LOAD
C     FA,FB,FC,FD   CONSTANTS FOR CONCRETE STRESS-STRAIN CURVE
C     FO            XK3 X CYL
C     FSY           STEEL YIELD STRENGTH
C     I1 TO I4      STRIP NUMBERS WITH STEEL
C     IO1           CONTROLS TYPE OF INITIAL SHRINKAGE ( 1 FOR FREE SHRIN
C     IO2           DEFINES TYPE OF LOADING ( 1 FOR SHORT-TERM )
C     NCY           MAXIMUM NUMBER OF COLUMN ITERATIONS
C     NET           NUMBER OF COLUMN ELEMENTS EXCLUDING STIFF END REGIONS
C     NIT           MAXIMUM NUMBER OF SECTION ITERATIONS
C     NP            CURRENT SUSTAINED LOAD TIME INTERVAL
C     NPT           NUMBER OF TIME INTERVALS
C     NSD           CONTROL FOR LOAD INCREMENTS
C     PER           TIME INTERVAL NUMBER
C     PHI           SECTION CURVATURE
```

```
C     PHITE            TRIAL VALUES FOR CURVATURE
C     PINC             FINAL INCREMENT SIZE FOR LOAD
C     PO               AXIAL LOAD
C     POO              INITIAL AXIAL LOAD
C     PSF              CONTROL FOR LOAD INCREMENT
C     PSUS             SUSTAINED LOAD
C     R                ROTATION OF JOINTS
C     S                SHRINKAGE STRAIN
C     SBM              BENDING MOMENTS AT EACH ELEMENT
C     SG               ULTIMATE CONCRETE STRENGTH GAIN
C     SHU              ULTIMATE SHRINKAGE STRAIN
C     SO               INITIAL SHRINKAGE
C     TL               TIME OF LOADING
C     TO               TIME WHEN SHRINKAGE BEGINS
C     WC               STRAIN AT MID-DEPTH
C     WCTE             TRIAL VALUES FOR STRAIN AT MID-DEPTH
C     WO               CONCRETE STRAIN AT MAXIMUM STRESS
C     WY               STEEL YIELD STRAIN
C     X                LATERAL DEFLECTION OF JOINTS
C     XK3              K3 FACTOR
C     XXCY,XXIT        CONVERGENCE ACCURACY (PERCENT)
C     Y                VERTICAL DEFLECTION OF JOINTS
*S
      PROGRAM COL (INPUT,OUTPUT,TAPE5=INPUT,TAPE6=OUTPUT)
      COMMON/DIM/D,B,D1,D2,D3,D4,DP,DP1,DP2,DP3,DP4,DDL,DX(20),I1,I2,I3,
     1I4
      COMMON/ST/ASFS,ASMFS,ASES,ASMES,AS,ASM,WY
      COMMON/F/FA,FB,FC,FD
      COMMON/T28P/CYL28,WO,XK3,CU,SHU,CA,CB
      COMMON/TLP/CYLTL,CFATL,CINIT,SO
      COMMON/TP/CYL,FO,S,C1,C2,AGEN
      COMMON/BMS/ABM(11),BM(11),SBM(11)
      COMMON/ECCE/ECC1,ECC2,ESUS1,ESUS2,EFIN1,EFIN2
      COMMON/TIM/TO,TL,PER(20)
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      COMMON/PIN/PO,PINC,PSF,NSD,PSUS
      COMMON/LO/NET,NJT,CL,AL,EBL
      COMMON/CC/WC(11),PHI(11),R(11),X(11),Y(11),SX(11)
      COMMON/TS/WCT(11),PHIT(11),WCTE(11),PHITE(11)
      COMMON/OAN/EOP(20,11),EO(20,11),EN(20,11),CO(20,11),CN(20,11)
      COMMON/ST1/FSY,ES,AST
      DIMENSION TITLE(10)
      READ(5,100)TITLE
      WRITE(6,200)TITLE
      WRITE(6,201)
      WRITE(6,205)
C
C         READ AND CALCULATE COLUMN PARAMETERS
C         REAL VALUES IN F10.0 FORMAT
C         INTERGERS IN I5 FORMAT
C
    1 READ(5,101)D,B,D1,D2,AST,ASM
      IF(D.GE.1000)STOP
      READ(5,101)CYLTL,WO,XK3,CU,SHU,CB
      READ(5,101)FSY,ES
      READ(5,103)NCY,NIT,NST,XCY,XIT
   11 READ(5,102)NET,CL,EBL
      IF(NET.GE.1000)GO TO 1
   12 READ(5,101)ESUS1,ESUS2,EFIN1,EFIN2
      IF(ESUS1.GE.1000.)GO TO 11
      READ(5,104)POO,PINC,PSF,NSD
      NSH=NST/2
      NSBM=NSH+1
      AL=CL/NET
      NJT=NET+1
      CA=(1.-CB)*28.
      SG=(1./CB-1.)*100.
    7 READ(5,101)TO,TL
      IF(TO.GE.1000.)GO TO 12
      READ(5,105)I01,I02
      IF(I02.EQ.1)GO TO 8
      READ(5,105)NPT
      READ(5,101)(PER(NP),NP=1,NPT)
      READ(5,101)PSUS
```

```
      ECC1=ESUS1
      ECC2=ESUS2
      GO TO 2
    8 NPT=1
      PER(1)=0.0
      PSUS=0.0
C
C        CALL INIT TO CALCULATE OTHER PARMETERS AND PROPERTIES AT TIME
C        OF LOADING
C
    2 CALL INIT(IO1)
C
C        WRITE COLUMN PARAMETERS
C
      WRITE(6,202)D,B,D1,D2,D3,D4,DP,AS,ASM,ASM,AS
      WRITE(6,203)CYLTL,WO,XK3,CU,SHU,SG
      WRITE(6,204)FSY,WY,ES
      WRITE(6,206)NET,CL,EBL
      WRITE(6,207)NCY,NIT,NST,XCY,XIT
      WRITE(6,209)ESUS1,ESUS2,EFIN1,EFIN2
      WRITE(6,210)TO,TL
      WRITE(6,214)
      IF(IO1.EQ.1)WRITE(6,211)
      IF(IO1.EQ.2)WRITE(6,212)
      WRITE(6,215)
      XXCY=XCY*.01
      XXIT=XIT*.01
      PO=POO
      NP=0
      IF=0
      IF(IO2.EQ.1)IF=1
C
C        INITIALIZE STRAINS
C
      DO 3 NJ=1,NJT
      DO 3 NS=1,NST
      EO(NS,NJ)=0.0
      EN(NS,NJ)=0.0
    3 CN(NS,NJ)=0.0
      DO 9 NJ=1,NJT
      WCTE(NJ)=SO+CINIT
      PHITE(NJ)=0.0
    9 SX(NJ)=0.0
    4 NP=NP+1
      DO 5 NJ=1,NJT
      DO 5 NS=1,NST
      EOP(NS,NJ)=EO(NS,NJ)
      EO(NS,NJ)=EN(NS,NJ)
    5 CO(NS,NJ)=CN(NS,NJ)
C
C        CALL TPROP TO CALCULATE TIME DEPENDENT PROPERTIES
C
      CALL TPROP(NP)
      IF(NP.EQ.1)GO TO 6
C
C        CALL CREEP TO CALCULATE CREEP STRAINS - SKIP IF FIRST SUSTAINED
C        TIME INTERVAL
C
      CALL CREEP
C
C        CALCULATE INITIAL TRIAL VALUES OF STRAIN AT MID-DEPTH AND CURVA
C        ENSURING THAT EFFECTIVE STRAINS ARE PRODUCED
C
      DO 13 NJ=1,NJT
      CYY=(CN(NSH,NJ)+CN(NSBM,NJ))/2.
      EYY=(EO(NSH,NJ)+EO(NSBM,NJ))/2.
      IF(EYY.GT.1.0E-06)WCTE(NJ)=S+CYY+EYY
      IF(BM(NJ).LT.0.0)GO TO 14
      WT=S+CN(1,NJ)
      PHITN=(WT-WCTE(NJ))/(.5*(D-DDL))
      IF(PHITN.GT.PHITE(NJ))PHITE(NJ)=PHITN
      GO TO 13
   14 WT=S+CN(NST,NJ)
      PHITN=(WCTE(NJ)-WT)/(.5*(D-DDL))
```

```
      IF(PHITN.LT.PHITE(NJ))PHITE(NJ)=PHITN
   13 CONTINUE
C
C          CALL PLAN TO FIND RESPONSE AT THIS INTERVAL
C
    6 CALL PLAN(IF,NP,IFO,AGEN,PER(NP))
C
C          START NEW COLUMN ANALYSIS IF SHORT-TERM
C
      IF(IFO.EQ.1)GO TO 10
C
C          MOVE TO NEXT TIME INTERVAL
C
      IF(NP.LT.NPT)GO TO 4
C
C          IF ALL TIME INTERVALS OVER ADD FINAL LOAD TO FAILURE
C
      IF=1
      PO=PSUS
      GO TO 6
   10 CONTINUE
      GO TO 7
  100 FORMAT(10A8)
  101 FORMAT(8F10.0)
  102 FORMAT(I5,2F10.0)
  103 FORMAT(3I5,2F10.0)
  104 FORMAT(3F10.0,I5)
  105 FORMAT(2I5)
  200 FORMAT(*1*,////,10A8,////////)
  201 FORMAT(//,10X,*INELASTIC SLENDER REINFORCED CONCRETE COLUMN ANALYS
     1IS.*,/,10X,*CROSS SECTION IS RECTANGULAR,SYMMETRIC,AND CONSTANT TH
     2ROUGHOUT COLUMN LENGTH.*,/,10X,*END BLOCK MAY BE INCLUDED - ASSUME
     3D INFINETLY STIFF BUT WILL ROTATE.*,/,10X,*COLUMN IS RESTRAINED HO
     4RIZONTALLY AT BOTH ENDS AND VERTICALLY AT BASE.*,/,10X,*LOADING IS
     5 APPLIED AT ENDS ONLY BUT NEED NOT BE SYMMETRIC.*,/,10X,*JOINT NO.
     61 IS BASE OF COLUMN - HIGHEST JOINT NO. IS TOP OF COLUMN.*,/,10X,*
     7ALL COLUMN ELEMENTS ARE OF EQUAL LENGTH.*,///)
  205 FORMAT(5X,*SIGN CONVENTION*,//,15X,*POSITIVE AXIAL FORCE - COMPRES
     1SION*,/,15X,*POSITIVE BENDING MOMENT - COMPRESSION ON RIGHT HAND S
     2IDE*,/,15X,*POSITIVE STRAIN - SHORTENING*,/,15X,*POSITIVE CURVATUR
     4E - SHORTENING ON RIGHT HAND SIDE*,/,15X,*POSITIVE HORIZONTAL DISP
     5LACEMENT - TO RIGHT*,/,15X,*POSITIVE VERTICAL DISPLACEMENT - UPWAR
     6D*,/,15X,*POSITIVE ROTATION - CLOCKWISE*,///)
  202 FORMAT(*1*,4X,*SECTION DETAILS*,//,26X,*TOTAL DEPTH OF SECTION =*,
     1F10.4,/,32X,*WIDTH OF SECTION =*,F10.4,/,15X,*DISTANCES FROM COMP
     2FACE TO STEEL =*,F10.4,/,50X,F10.4,/,50X,F10.4,/,50X,F10.4,/,4X,*D
     3ISTANCE FROM COMP FACE TO ZERO ECCENTRICITY =*,F10.4,/,37X,*STEEL
     4AREAS =*,F10.4,/,50X,F10.4,/,50X,F10.4,/,50X,F10.4,///)
  203 FORMAT(5X,*CONCRETE PROPERTIES*,//,12X,*CYLINDER STRENGTH AT TIME
     1OF LOADING =*,F8.3,/,13X,*STRAIN AT MAX STRESS ( SHORT TERM ) =*,F
     211.6,/,39X,*K3 FACTOR =*;F8.3,/,27X,*ULTIMATE CREEP FACTOR =*,F9.4
     3,/,23X,*ULTIMATE SHRINKAGE STRAIN =*,F11.6,/,6X,*MAXIMUM STRENGTH
     4GAIN OVER 28 DAY STRENGTH =*,F7.2,* PERCENT*,///)
  204 FORMAT(5X,*STEEL PROPERTIES*,//,36X,*YIELD STRESS =*,F8.3,/,36X,*Y
     1IELD STRAIN =*,F11.6,/,33X,*ELASTIC MODULUS =*,F10.2,///)
  206 FORMAT(5X,*COLUMN LAYOUT*,//,11X,*NUMBER OF ELEMENTS OVER COLUMN H
     1EIGHT =*,I5,/,35X,*COLUMN HEIGHT =*,F9.3,/,32X,*END BLOCK HEIGHT =
     2*,F9.3,///)
  207 FORMAT(5X,*CYCLE PARAMETERS*,//,28X,*MAX NUMBER OF CYCLES =*,I5,/,
     124X,*MAX NUMBER OF ITERATIONS =*,I5,/,32X,*NUMBER OF STRIPS =*,I5,
     2/,34X,*CYCLE ACCURACY =*,F8.2,* PERCENT*,/,30X,*ITERATION ACCURACY
     3 =*,F8.2,* PERCENT*,///)
  209 FORMAT(5X,*END ECCENTRICITY*,//,13X,*SUSTAINED LOAD ECCENTRICITY A
     1T BASE =*,F8.3,/,14X,*SUSTAINED LOAD ECCENTRICITY AT TOP =*,F8.3,/
     2,14X,*FINAL OVERALL ECCENTRICITY AT BASE =*,F8.3,/,15X,*FINAL OVER
     4ALL ECCENTRICITY AT TOP =*,F8.3,///)
  210 FORMAT(5X,*AGES*,//,23X,*AGE WHEN SHRINKAGE STARTS =*,F8.2,/,34X,*
     1AGE AT LOADING =*,F8.2,///)
  211 FORMAT(10X,*ASSUMED THAT SUFFICIENT LOAD IS PRESENT PRIOR TO TIME
     1OF LOADING*,/,10X,*TO ALLOW FREE SHRINKAGE TO OCCUR*,///)
  212 FORMAT(10X,*SHRINKAGE UP TO TIME OF LOADING IS PARTLY RESTRAINED B
     1Y STEEL.*,/,10X,*ACTUAL SHRINKAGE IS CALCULATED ON THE BASIS THAT
     2TENSION CREEP *,/,10X,*STRAIN IS EQUAL TO 3.5 TIMES THE ELASTIC TE
     3NSION STRAIN*,///)
```

```
  214 FORMAT(5X,*NOTE ON SHRINKAGE*,/)
  215 FORMAT(*1*,10X,*ANALYSIS USING CURVED STRESS-STRAIN DIAGRAM*)
      END
*S
      SUBROUTINE INIT(IO1)
      COMMON/DIM/D,B,D1,D2,D3,D4,DP,DP1,DP2,DP3,DP4,DDL,DX(20),I1,I2,I3,
     1I4
      COMMON/ST/ASFS,ASMFS,ASES,ASMES,AS,ASM,WY
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      COMMON/ST1/FSY,ES,AST
      COMMON/F/FA,FB,FC,FD
      COMMON/T28P/CYL28,WO,XK3,CU,SHU,CA,CB
      COMMON/TLP/CYLTL,CFATL,CINIT,SO
      COMMON/TIM/TO,TL,PER(20)
      D4=D-D1
      D3=D-D2
      DP=D/2.
      DP1=DP-D1
      DP2=DP-D2
      DP3=DP-D3
      DP4=DP-D4
      DDL=D/NST
      DO 1 NS=1,NST
    1 DX(NS)=DDL*(FLOAT(NS)-0.5)
      R1=D1/DDL
      I1=R1
      IF(I1.LT.R1)I1=I1+1
      IF(D1.EQ.0.0)I1=1
      R2=D2/DDL
      I2=R2
      IF(I2.LT.R2)I2=I2+1
      I3=D3/DDL+1
      I4=D4/DDL+1
      AS=AST/2.-ASM
      ASFS=FSY*AS
      ASES=ES*AS
      ASMFS=FSY*ASM
      ASMES=ES*ASM
      WY=FSY/ES
      FA=-.87754
      FB=1.45475
      FC=-2.77688
      FD=2.69967
      CYL28=CYLTL*(CA/TL+CB)
      IF(TL.LT.28.)CFATL=1.9616-.6644*ALOG10(TL)
      IF(TL.GE.28.)CFATL=1.7164-.4950*ALOG10(TL)
      IF(TL.GT.180.)CFATL=0.6
      TT=TL-TO
      SO=SHU*TT/(TT+35.)
      IF(IO1.EQ.1)GO TO 2
      EC=1000.*XK3*CYLTL
      AC=D*B-AST
      X=AC*EC/4.5
      WX=SO*X/(AST*ES+X)
      E=(WX-SO)/4.5
      CINIT=3.5*E
      RETURN
    2 CINIT=0.0
      RETURN
      END
*S
      SUBROUTINE TPROP(NP)
      COMMON/TIM/TO,TL,PER(20)
      COMMON/TP/CYL,FO,S,C1,C2,AGEN
      COMMON/TLP/CYLTL,CFATL,CINIT,SO
      COMMON/T28P/CYL28,WO,XK3,CU,SHU,CA,CB
      AGEN=TL+PER(NP)
      CYL=CYL28/(CA/AGEN+CB)
      FO=XK3*CYL
      TT=AGEN-TO
      S=SHU*TT/(TT+35.)
C
C         CALCULATE CREEP FACTORS IF SUSTAINED LOAD
C
```

```
      IF(NP.GT.1)GO TO 1
      RETURN
    1 NP1=NP-1
      CFDT1=(PER(NP)**0.68/(PER(NP)**0.68+13.5))-(PER(NP1)**0.68/(PER(NP
     11)**0.68+13.5))
      T1=PER(NP)-PER(NP1)
      CFDT2=T1**0.68/(T1**0.68+13.5)
      AGEO=TL+PER(NP1)
      IF(AGEO.LT.28.)CFAT=1.9615-.6644*ALOG10(AGEO)
      IF(AGEO.GE.28.)CFAT=1.7164-.4950*ALOG10(AGEO)
      IF(AGEO.GT.180.)CFAT=0.6
      C1=CU*CFATL*CFDT1
      C2=CU*CFAT*CFDT2
      RETURN
      END
*S
      SUBROUTINE CREEP
      COMMON/OAN/EOP(20,11),EO(20,11),EN(20,11),CO(20,11),CN(20,11)
      COMMON/LO/NET,NJT,CL,AL,EBL
      COMMON/TP/CYL,FO,S,C1,C2,AGEN
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      DO 1 NJ=1,NJT
      DO 1 NS=1,NST
      E1=EOP(NS,NJ)
      E2=EO(NS,NJ)
      DEA=E2-E1
      IF(E2.LT.0.0)E2=0.0
      C4=1.0
      IF(E1.LT.1.E-05)C4=0.0
      CFS1=1.0
      IF(E2.GT..00035)CFS1=.5205+1370.*E2
      CFR=1.0
      IF(DEA.LT.0.0)CFR=0.0
      CFS2=1.0
      IF(DEA.GT..00035)CFS2=.5205+1370.*DEA
    1 CN(NS,NJ)=CO(NS,NJ)+C1*CFS1*C4*E2+C2*CFS2*CFR*DEA
      RETURN
      END
*S
      SUBROUTINE PLAN(IF,NP,IFO,AGEN,PERT)
      COMMON/PIN/PO,PINC,PSF,NSD,PSUS
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      COMMON/LO/NET,NJT,CL,AL,EBL
      COMMON/CC/WC(11),PHI(11),R(11),X(11),Y(11),SX(11)
      COMMON/TS/WCT(11),PHIT(11),WCTE(11),PHITE(11)
      COMMON/BMS/ABM(11),BM(11),SBM(11)
      COMMON/ECCE/ECC1,ECC2,ESUS1,ESUS2,EFIN1,EFIN2
      DIMENSION DY(11),EI(11)
      IF(IF.EQ.0)GO TO 2
      M=0
      N=0
      L=1
      ECC1=EFIN1
      ECC2=EFIN2
      PINC=PINC*PSF**NSD
C
C        CALL LOADS TO FIND NEXT AXIAL LOAD IF LOADING TO FAILURE
C
    1 CALL LOADS(L,M,N)
      IF(N.NE.1)GO TO 3
      IFO=1
      RETURN
    2 PO=PSUS
C
C        CALL STATIC TO FIND MOMENTS AT EACH ELEMENT
C
    3 CALL STATIC(PO,HO)
      WRITE(6,201)PO,ABM(1),ABM(NJT),HO
      WRITE(6,202)AGEN,PERT
      DO 16 NJ=1,NJT
      WCT(NJ)=WCTE(NJ)
      PHIT(NJ)=PHITE(NJ)
   16 BM(NJ)=ABM(NJ)-SX(NJ)*PO
      KCY=0
```

```
    4 KCY=KCY+1
      IF(KCY.LE.NCY)GO TO 8
      WRITE(6,203)
      L=2
      GO TO 14
    8 DO 9 NJ=1,NJT
C
C          CALL WPCAL TO CALCULATE STRAIN DISTRIBUTIONS
C
      CALL WPCAL(PO,BM(NJ),NJ,NP,L,WC(NJ),PHI(NJ))
      IF(L.EQ.1)GO TO 9
      WRITE(6,204)KCY
      IF(L.EQ.2)WRITE(6,207)NJ,BM(NJ)
      IF(L.EQ.3)WRITE(6,208)NJ,BM(NJ)
      GO TO 14
    9 CONTINUE
      DO 17 NJ=1,NJT
      WCT(NJ)=WC(NJ)
   17 PHIT(NJ)=PHI(NJ)
C
C          CALL CORCAL TO FIND DEFLECTED SHAPE OF COLUMN
C
      CALL CORCAL
C
C          CALL SECBM TO FIND BENDING MOMENTS AT EACH ELEMENT
C
      CALL SECBM(PO)
C
C          CALL CONV TO CHECK FOR CONVERGENCE
C
      CALL CONV(KCY,IC)
      IF(IC.EQ.0)GO TO 4
      WRITE(6,204)KCY
      WRITE(6,210)
      DO 12 NJ=1,NJT
      WCTE(NJ)=WC(NJ)
      PHITE(NJ)=PHI(NJ)
      IF(ABS(PHI(NJ)).LT.1.0E-50)PHI(NJ)=1.
      EI(NJ)=BM(NJ)/PHI(NJ)
      SX(NJ)=X(NJ)
      BY=AL*FLOAT(NJ-1)+EBL
      DY(NJ)=Y(NJ)-BY
   12 WRITE(6,211)NJ,BM(NJ),WC(NJ),PHI(NJ),R(NJ),X(NJ),DY(NJ),EI(NJ)
      WRITE(6,214)
   14 IF(IF.EQ.1)GO TO 1
      IF(L.EQ.1)GO TO 15
      IFO=1
      RETURN
   15 IFO=0
      RETURN
  201 FORMAT(///,5X,*EXTERNAL FORCES ACTING ON COLUMN ENDS*,//,17X,*AXIA
     1L FORCE =*,F10.3,/,14X,*MOMENT AT BASE =*,F10.3,/,15X,*MOMENT AT T
     2OP =*,F10.3,/,17X,*SHEAR FORCE =*,F10.3,///)
  202 FORMAT(5X,*TIMES*,//,25X,*AGE =*,F8.2,/,2X,*DURATION OF SUSTAINED
     1LOAD =*,F8.2,///)
  203 FORMAT(///,10X,*MAXIMUM NUMBER OF CYCLES EXCEEDED*,///)
  204 FORMAT(10X,*CYCLE NO. *,I4,///)
  207 FORMAT(////,10X,*AT JOINT NO.*,I4,*BENDING MOMONT =*,F10.4,/,10X,*
     1AT THIS JOINT NO STRAIN DISTRIBUTION IS FOUND - MAX NO. OF ITERATI
     2ONS EXCEEDED*,///)
  208 FORMAT(////,10X,*AT JOINT NO.*,I4,*BENDING MOMONT =*,F10.4,/,10X,*
     1AT THIS JOINT NO STRAIN DISTRIBUTION IS FOUND - RR FOUND TO BE ZER
     2O*,///)
  210 FORMAT(*  JOINT   BENDING MOMENT   MID-DEPTH STRAIN   CURVATURE
     1ROTATION   HORZ DISP   VERT DISP    MOM/CUR=EI*)
  211 FORMAT(3X,I2,4X,F12.4,6X,F12.8,4X,F12.8,2X,F9.6,2X,F10.6,2X,F10.6,
     13X,E12.6)
  214 FORMAT(///,10X,*OVERALL CONVERGENCE MET*,///)
      END
*S
      SUBROUTINE LOADS(L,M,N)
      COMMON/PIN/PO,PINC,PSF,NSD,PSUS
      IF(L.EQ.1)GO TO 1
      IF(M.LT.NSD)GO TO 2
```

```
      N=1
      RETURN
    2 PO=PO-PINC
      PINC=PINC/PSF
      M=M+1
    1 PO=PO+PINC
      RETURN
      END
*S
      SUBROUTINE STATIC(PO,HO)
      COMMON/BMS/ABM(11),BM(11),SBM(11)
      COMMON/ECCE/ECC1,ECC2,ESUS1,ESUS2,EFIN1,EFIN2
      COMMON/LO/NET,NJT,CL,AL,EBL
      X=(ECC1-ECC2)/(CL+EBL*2.)
      DO 1 NJ=1,NJT
    1 ABM(NJ)=PO*(ECC1-(EBL+AL*(NJ-1))*X)
      HO=PO*X
      RETURN
      END
*S
      SUBROUTINE WPCAL(P,BM,NJ,NP,L,STRAIN,CURVA)
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      COMMON/TS/WCT(11),PHIT(11),WCTE(11),PHITE(11)
      WC=WCT(NJ)
      PHI=PHIT(NJ)
C
C         CALCULATE INCREMENTS FOR NEWTON RAPHSON METHOD
C
      CCA=5.0E-04
      CCB = 1.0E-10
      CCC=CCB
      IF(BM.LT.0.0)CCC=-CCB
      KOUNT = 0
      K1=1
      XA=WC
      XB=PHI
    1 CALL BMPCAL(WC,PHI,NJ,NP,PCAL1,BMCAL1)
      XC=XA
      XD=XB
      XA=WC
      XB=PHI
      KOUNT = KOUNT + 1
C
C         CONVERGENCE CHECK
C
      IF(ABS(P).LE.0.1)ERR1=ABS(PCAL1)*XXIT*10.
      IF(ABS(P).GT.0.1)ERR1=ABS((P-PCAL1)/P)
      IF(ABS(BM).LE.0.1)ERR2=ABS(BMCAL1)*XXIT*10.
      IF(ABS(BM).GT.0.1)ERR2=ABS((BM-BMCAL1)/BM)
      IF(ERR1.LE.XXIT.AND.ERR2.LE.XXIT)GO TO 2
      IF(KOUNT.GT.NIT)GO TO 3
      WINC=CCA*WC+CCB
      PHINC=CCA*PHI+CCC
      IF(WINC.EQ.0.0)WINC=CCB
      IF(PHINC.EQ.0.0)PHINC=CCC
      WCNEW=WC+WINC
      PHINEW = PHI + PHINC
C
C         CALL BMPCAL TO FIND LOADS FOR STRAIN DISTRIBUTION
C
      CALL BMPCAL(WC,PHINEW,NJ,NP,PCAL2,BMCAL2)
      CALL BMPCAL(WCNEW,PHI,NJ,NP,PCAL3,BMCAL3)
      A11 =(PCAL2-PCAL1)/PHINC
      A12 = (PCAL3-PCAL1)/WINC
      A13 = P - PCAL1
      A21 = (BMCAL2 - BMCAL1)/PHINC
      A22 = ( BMCAL3-BMCAL1)/WINC
      A23 = BM - BMCAL1
      RR = A11*A22-A21*A12
      IF(ABS(RR).LE.1.0E-100)GO TO 4
      WDEL = (A11*A23-A13*A21)/RR
      PHIDEL = (A13*A22 - A23*A12)/RR
      WC=WC+WDEL
      PHI = PHI + PHIDEL
```

```
      IF(ABS(WC-XC).GE.1.0E-08.OR.ABS(PHI-XD).GE.1.0E-08)GO TO 1
      WC=(WC+XA)/2.
      PHI=(PHI+XB)/2.
      GO TO 1
    2 STRAIN=WC
      CURVA=PHI
      L=1
      RETURN
    3 L=2
      RETURN
    4 KOUNT=0
      IF(K1.EQ.6)GO TO 11
      WX=1.0
      GO TO(5,6,7,8,9)K1
    5 PX=.83
      GO TO 10
    6 PX=1.1
      WX=1.1
      GO TO 10
    7 PX=1.2
      GO TO 10
    8 PX=.7
      GO TO 10
    9 PX=.6
   10 K1=K1+1
      PHI=PHIT(NJ)*PX
      WC=WCT(NJ)*WX
      GO TO 1
   11 L=3
      RETURN
      END
*S
      SUBROUTINE BMPCAL(WC,PHI,NJ,NP,PCAL,BMCAL)
      COMMON/DIM/D,B,D1,D2,D3,D4,DP,DP1,DP2,DP3,DP4,DDL,DX(20),I1,I2,I3,
     1I4
      COMMON/OAN/EOP(20,11),EO(20,11),EN(20,11),CO(20,11),CN(20,11)
      COMMON/ST/ASFS,ASMFS,ASES,ASMES,AS,ASM,WY
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      DIMENSION STR(20)
      WCON=WC+PHI*D/2.
      W1=WCON-PHI*D1
      W2=WCON-PHI*D2
      W3=WCON-PHI*D3
      W4=WCON-PHI*D4
      PCON=0.0
      BMCON=0.0
      DO 3 NS=1,NST
      WX=WCON-PHI*DX(NS)
      IF(WX.GT.0.0)GO TO 1
      EN(NS,NJ)=0.0
      STRESS=0.0
      GO TO 2
    1 CALL STCAL(WX,NS,NJ,NP,STRESS)
    2 STR(NS)=STRESS
      PCONCR=STRESS*B*DDL
      BMCONC=PCONCR*(DP-DX(NS))
      PCON=PCON+PCONCR
      BMCON=BMCON+BMCONC
    3 CONTINUE
      PCON=PCON-AS*(STR(I1)+STR(I4))-ASM*(STR(I2)+STR(I3))
      BMCON=BMCON-AS*(STR(I1)*DP1+STR(I4)*DP4)-ASM*(STR(I2)*DP2+STR(I3)*
     1DP3)
      IF(ABS(W1).LE.WY)PS1=ASES*W1
      IF(ABS(W1).GT.WY)PS1=ASFS*W1/ABS(W1)
      IF(ABS(W2).LE.WY)PS2=ASMES*W2
      IF(ABS(W2).GT.WY)PS2=ASMFS*W2/ABS(W2)
      IF(ABS(W3).LE.WY)PS3=ASMES*W3
      IF(ABS(W3).GT.WY)PS3=ASMFS*W3/ABS(W3)
      IF(ABS(W4).LE.WY)PS4=ASES*W4
      IF(ABS(W4).GT.WY)PS4=ASFS*W4/ABS(W4)
      PCAL=PCON+PS1+PS2+PS3+PS4
      BMCAL=BMCON+PS1*DP1+PS2*DP2+PS3*DP3+PS4*DP4
      RETURN
      END
```

```
*S
      SUBROUTINE STCAL(WX,NS,NJ,NP,STRESS)
      COMMON/F/FA,FB,FC,FD
      COMMON/TLP/CYLTL,CFATL,CINIT,SO
      COMMON/TP/CYL,FO,S,C1,C2,AGEN
      COMMON/T28P/CYL28,WO,XK3,CU,SHU,CA,CB
      COMMON/OAN/EOP(20,11),EO(20,11),EN(20,11),CO(20,11),CN(20,11)
      IF(NP.EQ.1)GO TO 1
      EN(NS,NJ)=WX-CN(NS,NJ)-S
      GO TO 2
    1 EN(NS,NJ)=WX-CINIT-S
    2 IF(EN(NS,NJ).GT.0.0)GO TO 3
      EN(NS,NJ)=0.0
      STRESS=0.0
      RETURN
    3 WXX=EN(NS,NJ)/WO
      IF(WXX.LE.1.5)FACTOR=FA*WXX**4+FB*WXX**3+FC*WXX**2+FD*WXX
      IF(WXX.GT.1.5.AND.WXX.LT.3.0)FACTOR=(3.0-WXX)*1.6/3.0
      IF(WXX.GE.3.0)FACTOR=0.0
      STRESS=FACTOR*FO
      RETURN
      END
*S
      SUBROUTINE CORCAL
      COMMON/CC/WC(11),PHI(11),R(11),X(11),Y(11),SX(11)
      COMMON/LO/NET,NJT,CL,AL,EBL
      DIMENSION WCA(10),PHIA(10)
      DO 3 NE=1,NET
      NN=NE+1
      WCA(NE)=(WC(NE)+WC(NN))/2.
    3 PHIA(NE)=(PHI(NE)+PHI(NN))/2.
      R(1)=0.
      X(1)=0.
      Y(1)=EBL
      DO 1 J=2,NJT
      I=J-1
      B=PHIA(I)*AL/2.
      R(J)=R(I)+2.*B
      AL1=AL*(1.-WCA(I))
      XL=AL1
      IF(ABS(B).GT.1.E-10)XL=AL1*SIN(B)/B
      X(J)=X(I)+SIN(B+R(I))*XL
    1 Y(J)=Y(I)+COS(B+R(I))*XL
      XT=X(NJT)+EBL*SIN(R(NJT))
      YT=Y(NJT)+EBL*COS(R(NJT))
      H=(XT**2+YT**2)**0.5
      CA=YT/H
      SA=XT/H
      ALFA=ATAN(XT/YT)
      DO 2 J=1,NJT
      R(J)=R(J)-ALFA
      XO=X(J)
      YO=Y(J)
      X(J)=CA*XO-SA*YO
      Y(J)=SA*XO+CA*YO
    2 CONTINUE
      RETURN
      END
*S
      SUBROUTINE SECBM(PO)
      COMMON/LO/NET,NJT,CL,AL,EBL
      COMMON/CC/WC(11),PHI(11),R(11),X(11),Y(11),SX(11)
      COMMON/BMS/ABM(11),BM(11),SBM(11)
      DO 1 NJ=1,NJT
    1 SBM(NJ)=ABM(NJ)-PO*X(NJ)
      RETURN
      END
*S
      SUBROUTINE CONV(KCY,IC)
      COMMON/LO/NET,NJT,CL,AL,EBL
      COMMON/CP/NCY,NIT,NST,XXCY,XXIT
      COMMON/BMS/ABM(11),BM(11),SBM(11)
      ABMM=ABM(1)
      IF(ABS(ABM(1)).LT.ABS(ABM(NJT)))ABMM=ABM(NJT)
```

```
      DO 1 NJ=1,NJT
    1 IF(ABS((SBM(NJ)-BM(NJ))/ABMD).GT.XXCY)GO TO 3
      IC=1
      RETURN
    3 DO 4 NJ=1,NJT
    4 BM(NJ)=SBM(NJ)
      IC=0
      RETURN
      END
```

APPENDIX C

ANALYTICAL RESULTS

Tables C1 to C24 give the predicted analytical column capacities and the corresponding moment magnifications as defined in Section 5.6.

Refer to Table 5.2 for the section properties of each column.

The following notation is used in the tables:

P_{AN}	analytical column capacities (kips), excluding capacity reduction factor (P_{an} in text)
DEL	moment magnifications (δ_{an} in text)
P_S/P_{AN}	ratio of sustained load to ultimate load (P_{sus}/P_{an} in text)
E/H	ratio of eccentricity to section depth (e/h in text)
E_1/E_2	ratio of end eccentricities (e_1/e_2 in text)
L/H	ratio of column length to section depth (L/h in text)

ANALYTICAL RESULTS - COLUMN 1

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	204.0	1.32	.300	204.0	1.32	.402	204.0	1.32	.500	202.0	1.37	.604	192.0	1.57	.698	182.0	1.78	.781	169.0	2.07
		0.25	132.0	1.22	.300	132.0	1.22	.402	132.0	1.22	.496	131.0	1.23	.594	128.0	1.27	.757	115.0	1.46	.785	112.0	1.51
		0.5	65.0	1.14	.307	63.5	1.15	.427	62.0	1.16	.508	61.0	1.18	.619	59.0	1.19	.630	58.0	1.21	.804	56.0	1.23
		1.0	21.5	1.10	.294	21.3	1.11	.405	21.0	1.12	.500	20.8	1.13	.598	20.5	1.14	.695	20.5	1.14	.815	20.3	1.1
	0.0	0.1	222.0	1.00	.300	222.0	1.00	.400	222.0	1.00	.500	222.0	1.00	.599	222.0	1.00	.684	215.0	1.11	.792	197.0	1.47
		0.25	150.0	1.00	.300	150.0	1.00	.400	150.0	1.00	.500	150.0	1.00	.600	150.0	1.00	.733	150.0	1.00	.779	149.0	1.02
		0.5	79.0	1.00	.300	79.0	1.00	.400	79.0	1.00	.500	79.0	1.00	.600	79.0	1.00	.700	79.0	1.00	.800	79.0	1.00
		1.0	24.5	1.00	.300	24.5	1.00	.400	24.5	1.00	.500	24.5	1.00	.600	24.5	1.00	.700	24.5	1.00	.800	24.5	1.00
	-0.38	0.1	222.0	1.00	.300	222.0	1.00	.400	222.0	1.00	.500	222.0	1.00	.600	222.0	1.00	.700	222.0	1.00	.800	222.0	1.00
		0.25	150.0	1.00	.300	150.0	1.00	.400	150.0	1.00	.500	150.0	1.00	.600	150.0	1.00	.700	150.0	1.00	.800	150.0	1.00
		0.5	79.0	1.00	.300	79.0	1.00	.400	79.0	1.00	.500	79.0	1.00	.600	79.0	1.00	.700	79.0	1.00	.800	79.0	1.00
		1.0	24.5	1.00	.300	24.5	1.00	.400	24.5	1.00	.500	24.5	1.00	.600	24.5	1.00	.700	24.5	1.00	.800	24.5	1.00
20.	1.0	0.1	159.0	2.30	.315	145.0	2.63	.413	138.0	2.86	.523	128.0	3.18	.655	116.0	3.62	.696	112.0	3.78	.828	93.0	4.20
		0.25	92.0	1.60	.310	84.0	1.93	.425	80.0	1.99	.547	75.0	2.08	.611	72.0	2.13	.691	66.0	2.21	.794	63.0	2.31
		0.5	44.5	1.41	.329	41.0	1.46	.413	40.0	1.49	.519	38.5	1.52	.635	37.0	1.57	.694	36.0	1.58	.786	35.0	1.61
		1.0	18.8	1.22	.296	17.8	1.26	.406	17.3	1.29	.500	17.0	1.30	.612	16.8	1.33	.697	16.5	1.33	.800	16.3	1.35
	0.0	0.1	189.0	1.65	.305	183.0	1.76	.416	173.0	1.97	.473	167.0	2.11	.584	154.0	2.42	.701	137.0	2.89	.813	123.0	3.35
		0.25	134.0	1.19	.325	123.0	1.34	.415	118.0	1.42	.509	112.0	1.51	.610	105.0	1.62	.704	98.0	1.72	.800	90.0	1.93
		0.5	77.0	1.02	.324	71.0	1.08	.413	69.0	1.10	.500	67.0	1.11	.606	63.5	1.15	.702	60.5	1.18	.814	56.5	1.24
		1.0	24.5	1.00	.300	24.5	1.00	.400	24.5	1.00	.500	24.5	1.00	.608	24.3	1.02	.708	24.0	1.02	.800	23.8	1.03
	-0.39	0.1	221.0	1.00	.300	221.0	1.00	.400	221.0	1.00	.500	221.0	1.00	.605	215.0	1.11	.685	203.0	1.34	.811	180.0	1.32
		0.25	150.0	1.00	.300	150.0	1.00	.400	150.0	1.00	.500	150.0	1.00	.600	150.0	1.00	.700	150.0	1.00	.807	140.0	1.12
		0.5	79.0	1.00	.300	79.0	1.00	.400	79.0	1.00	.500	79.0	1.00	.600	79.0	1.00	.700	79.0	1.00	.800	79.0	1.00
		1.0	24.5	1.00	.300	24.5	1.00	.400	24.5	1.00	.500	24.5	1.00	.600	24.5	1.00	.700	24.5	1.00	.800	24.5	1.00
30.	1.0	0.1	107.0	3.98	.315	89.0	4.63	.402	82.0	4.89	.527	74.0	5.24	.632	68.0	5.51	.692	65.0	5.68	.828	58.0	6.03
		0.25	55.0	2.50	.326	47.5	2.72	.433	45.0	2.80	.553	42.5	2.90	.637	40.5	2.96	.709	39.5	3.01	.800	37.5	3.09
		0.5	30.5	1.75	.315	27.0	1.90	.415	26.5	1.90	.510	25.5	1.96	.633	24.5	2.02	.708	24.0	2.03	.864	23.0	2.10
		1.0	15.5	1.40	.316	14.3	1.48	.393	14.0	1.52	.509	13.8	1.53	.593	13.5	1.56	.712	13.0	1.60	.804	12.8	1.62
	0.0	0.1	136.0	2.92	.280	125.0	3.28	.407	113.0	3.73	.510	104.0	4.09	.588	97.0	4.34	.718	85.0	4.79	.829	76.0	5.16
		0.25	88.0	1.87	.319	72.0	2.13	.384	69.0	2.20	.500	64.0	2.29	.608	60.0	2.37	.708	56.5	2.47	.792	53.0	2.56
		0.5	51.5	1.30	.286	45.5	1.38	.391	43.5	1.43	.506	41.5	1.47	.608	39.5	1.50	.697	38.0	1.54	.792	35.0	1.58
		1.0	23.3	1.04	.322	21.8	1.09	.395	21.5	1.10	.500	21.0	1.12	.598	20.5	1.14	.691	20.3	1.15	.797	19.8	1.17
	-0.38	0.1	175.0	1.93	.300	175.0	1.93	.400	175.0	1.93	.512	168.0	2.08	.614	153.0	2.32	.687	147.0	2.61	.795	132.0	3.05
		0.25	145.5	1.06	.311	140.0	1.12	.414	134.0	1.19	.508	123.0	1.27	.623	118.0	1.42	.703	109.5	1.56	.810	100.0	1.69
		0.5	79.0	1.00	.300	79.0	1.00	.400	79.0	1.00	.500	79.0	1.00	.629	75.5	1.04	.715	72.0	1.06	.796	68.5	1.10
		1.0	24.5	1.00	.300	24.5	1.00	.400	24.5	1.00	.500	24.5	1.00	.600	24.5	1.00	.700	24.5	1.00	.800	24.5	1.00

ANALYTICAL RESULTS - COLUMN 2

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	321.0	1.32	.300	321.0	1.32	.400	321.0	1.32	.500	321.0	1.32	.597	315.0	1.40	.698	301.0	1.58	.618	280.0	1.84
		0.25	201.0	1.22	.300	201.0	1.22	.400	201.0	1.22	.500	200.0	1.22	.611	193.0	1.28	.714	182.0	1.37	.802	172.0	1.44
		0.5	78.0	1.14	.311	75.5	1.[illegible]6	.409	74.5	1.17	.514	73.0	1.18	.608	71.5	1.19	.700	70.0	1.19	.796	68.5	1.21
		1.0	23.5	1.11	.308	22.8	1.14	.400	22.5	1.16	.506	22.3	1.16	.607	22.3	1.16	.716	22.0	1.17	.793	21.8	1.18
	0.0	0.1	349.0	1.00	.300	349.0	1.00	.400	349.0	1.00	.500	349.0	1.00	.600	349.0	1.00	.691	349.0	1.00	.809	330.0	1.22
		0.25	233.0	1.00	.300	233.0	1.00	.400	233.0	1.00	.500	233.0	1.00	.600	233.0	1.00	.700	233.0	1.00	.800	233.0	1.00
		0.5	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00
		1.0	27.8	1.00	.300	27.8	1.00	.400	27.8	1.00	.500	27.8	1.00	.600	27.8	1.00	.700	27.5	1.00	.600	27.8	1.00
	-0.98	0.1	349.0	1.00	.300	349.0	1.00	.400	349.0	1.00	.500	349.0	1.00	.600	349.0	1.00	.700	349.0	1.00	.800	349.0	1.00
		0.25	233.0	1.00	.300	233.0	1.00	.400	233.0	1.00	.500	233.0	1.00	.600	233.0	1.00	.700	233.0	1.00	.600	233.0	1.00
		0.5	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00
		1.0	27.8	1.00	.300	27.8	1.00	.400	27.8	1.00	.500	27.8	1.00	.600	27.8	1.00	.700	27.8	1.00	.800	27.8	1.00
20.	1.0	0.1	247.0	2.29	.309	236.0	2.46	.409	225.0	2.63	.512	213.0	2.82	.629	197.0	3.12	.699	185.0	3.34	.795	171.0	3.63
		0.25	130.0	1.75	.316	117.0	1.88	.429	112.0	1.92	.542	107.0	1.97	.670	100.0	2.04	.711	97.0	2.06	.802	91.0	2.13
		0.5	52.5	1.38	.316	47.5	1.46	.409	46.5	1.47	.511	45.0	1.50	.621	43.5	1.53	.694	42.5	1.55	.783	41.5	1.58
		1.0	20.0	1.26	.303	19.0	1.30	.400	18.8	1.31	.500	18.5	1.32	.611	18.0	1.34	.681	18.0	1.34	.814	17.5	1.38
	0.0	0.1	294.0	1.67	.300	294.0	1.67	.399	286.0	1.77	.504	272.0	1.95	.622	251.0	2.24	.698	235.0	2.47	.795	215.0	2.79
		0.25	205.0	1.19	.304	194.0	1.27	.416	185.0	1.34	.494	178.0	1.40	.601	168.0	1.47	.701	157.0	1.55	.795	146.0	1.63
		0.5	97.5	1.03	.311	91.5	1.06	.408	89.5	1.07	.503	86.5	1.09	.599	83.5	1.11	.700	80.0	1.13	.797	76.5	1.16
		1.0	27.8	1.00	.300	27.5	1.00	.404	27.3	1.02	.519	27.0	1.02	.617	26.8	1.03	.698	26.5	1.03	.800	26.3	1.04
	-0.98	0.1	348.0	1.01	.300	348.0	1.01	.400	348.0	1.01	.500	348.0	1.01	.589	348.0	1.01	.729	329.0	1.23	.806	310.0	1.46
		0.25	233.0	1.00	.300	233.0	1.00	.400	233.0	1.00	.500	233.0	1.00	.600	233.0	1.00	.700	233.0	1.00	.800	233.0	1.00
		0.5	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00
		1.0	27.8	1.00	.300	27.8	1.00	.400	27.8	1.00	.500	27.8	1.00	.600	27.8	1.00	.700	27.8	1.00	.800	27.8	1.00
30.	1.0	0.1	165.0	3.74	.306	147.0	4.07	.404	136.0	4.27	.512	125.0	4.50	.612	116.0	4.71	.710	107.0	4.92	.790	100.0	5.09
		0.25	72.0	2.37	.314	60.5	2.59	.422	58.0	2.65	.532	55.5	2.70	.642	53.0	2.74	.699	51.5	2.80	.788	49.5	2.84
		0.5	35.5	1.73	.323	31.0	1.87	.417	30.0	1.91	.508	29.5	1.93	.632	28.5	1.96	.709	27.5	2.01	.796	27.0	2.04
		1.0	16.8	1.43	.311	15.3	1.53	.433	15.0	1.55	.508	14.8	1.57	.603	14.5	1.59	.702	14.3	1.61	.804	14.0	1.64
	0.0	0.1	211.0	2.86	.295	200.0	3.06	.422	185.0	3.36	.511	174.0	3.57	.615	161.0	3.80	.721	147.0	4.07	.815	135.0	4.29
		0.25	133.0	1.73	.307	112.5	1.90	.396	106.0	1.98	.503	98.5	2.04	.603	92.0	2.12	.708	85.5	2.19	.800	63.0	2.27
		0.5	66.0	1.24	.324	55.5	1.35	.421	53.5	1.37	.500	52.0	1.39	.500	50.0	1.41	.698	48.0	1.45	.813	45.5	1.49
		1.0	25.3	1.07	.316	23.8	1.12	.404	23.5	1.11	.500	23.0	1.13	.593	22.8	1.14	.697	22.3	1.16	.805	21.8	1.18
	-0.98	0.1	271.0	1.96	.300	271.0	1.96	.400	271.0	1.96	.491	271.0	1.96	.604	265.0	2.04	.694	248.0	2.28	.808	224.0	2.64
		0.25	224.0	1.06	.302	222.0	1.07	.404	215.5	1.11	.504	206.5	1.17	.604	195.5	1.26	.707	161.0	1.38	.800	167.5	1.48
		0.5	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.620	100.0	1.02	.710	96.5	1.03	.800	92.5	1.06
		1.0	27.8	1.00	.300	27.8	1.00	.400	27.8	1.00	.500	27.9	1.00	.600	27.8	1.00	.700	27.8	1.00	.800	27.8	1.00

ANALYTICAL RESULTS - COLUMN 3

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	209.0	1.33	.300	209.0	1.33	.402	209.0	1.33	.505	208.0	1.35	.602	201.0	1.50	.689	193.0	1.68	.801	176.0	2.08
		0.25	144.0	1.20	.300	144.0	1.20	.400	144.0	1.20	.500	144.0	1.20	.594	143.0	1.21	.722	133.0	1.36	.787	127.0	1.45
		0.5	77.5	1.12	.309	76.0	1.13	.413	75.0	1.14	.510	73.5	1.16	.621	72.0	1.18	.688	70.5	1.19	.794	68.0	1.22
		1.0	26.5	1.08	.300	26.5	1.08	.400	26.5	1.08	.500	26.5	1.08	.620	26.3	1.09	.686	26.3	1.09	.808	26.0	1.10
	0.0	0.1	225.0	1.00	.300	225.0	1.00	.400	225.0	1.00	.500	225.0	1.00	.600	225.0	1.00	.724	214.0	1.22	.802	202.0	1.48
		0.25	160.0	1.00	.300	160.0	1.00	.400	160.0	1.00	.500	160.0	1.00	.600	160.0	1.00	.700	160.0	1.00	.800	160.0	1.00
		0.5	90.0	1.00	.300	90.0	1.00	.400	90.0	1.00	.500	90.0	1.00	.600	90.0	1.00	.700	90.0	1.00	.800	90.0	1.00
		1.0	30.3	1.00	.300	30.3	1.00	.400	30.3	1.00	.500	30.3	1.00	.600	30.3	1.00	.700	30.3	1.00	.800	30.3	1.00
	-0.98	0.1	225.0	1.00	.300	225.0	1.00	.400	225.0	1.00	.500	225.0	1.00	.600	225.0	1.00	.700	225.0	1.00	.800	225.0	1.00
		0.25	160.0	1.00	.300	160.0	1.00	.400	160.0	1.00	.500	160.0	1.00	.600	160.0	1.00	.700	160.0	1.00	.800	160.0	1.00
		0.5	90.0	1.00	.300	90.0	1.00	.400	90.0	1.00	.500	90.0	1.00	.600	90.0	1.00	.700	90.0	1.00	.800	90.0	1.00
		1.0	30.3	1.00	.300	30.3	1.00	.400	30.3	1.00	.500	30.3	1.00	.600	30.3	1.00	.700	30.3	1.00	.800	30.3	1.00
20.	1.0	0.1	168.0	2.29	.302	159.0	2.53	.401	152.0	2.74	.510	143.0	3.03	.617	133.0	3.39	.707	123.0	3.80	.793	116.0	4.04
		0.25	107.0	1.74	.297	101.0	1.83	.398	98.0	1.88	.522	92.0	1.97	.647	85.0	2.09	.695	82.0	2.15	.803	76.0	2.27
		0.5	57.0	1.36	.314	52.5	1.43	.422	51.0	1.46	.525	49.5	1.48	.632	47.5	1.52	.699	46.5	1.54	.798	44.5	1.58
		1.0	22.8	1.20	.297	22.8	1.20	.400	22.5	1.22	.494	22.3	1.22	.591	22.0	1.24	.709	21.5	1.25	.800	21.3	1.26
	0.0	0.1	194.0	1.65	.305	190.0	1.75	.412	182.0	1.93	.512	172.0	2.19	.624	157.0	2.59	.722	144.0	3.00	.806	134.0	3.35
		0.25	146.0	1.17	.293	140.0	1.25	.403	134.0	1.34	.496	129.0	1.42	.617	120.0	1.56	.714	112.0	1.67	.798	104.0	1.76
		0.5	89.0	1.01	.289	86.5	1.04	.393	84.0	1.06	.497	81.5	1.08	.606	77.5	1.12	.712	73.0	1.16	.799	69.5	1.21
		1.0	30.3	1.00	.300	30.3	1.00	.400	30.3	1.00	.500	30.3	1.00	.600	30.3	1.00	.700	30.3	1.00	.800	30.3	1.00
	-0.98	0.1	225.0	1.00	.300	225.0	1.00	.400	225.0	1.00	.500	225.0	1.00	.613	217.0	1.16	.694	206.0	1.39	.798	188.0	1.79
		0.25	160.0	1.00	.300	160.0	1.00	.400	160.0	1.00	.500	160.0	1.00	.600	160.0	1.00	.700	160.0	1.00	.800	155.0	1.06
		0.5	90.0	1.00	.300	90.0	1.00	.400	90.0	1.00	.500	90.0	1.00	.600	90.0	1.00	.700	90.0	1.00	.800	90.0	1.00
		1.0	30.3	1.00	.300	30.3	1.00	.400	30.3	1.00	.500	30.3	1.00	.600	30.3	1.00	.700	30.3	1.00	.800	30.3	1.00
30.	1.0	0.1	122.0	3.83	.333	102.0	4.54	.447	94.0	4.85	.505	91.0	4.98	.581	86.0	5.19	.727	77.0	5.60	.795	73.0	5.82
		0.25	71.5	2.36	.323	62.0	2.58	.429	59.5	2.66	.549	56.5	2.75	.615	54.5	2.80	.686	52.5	2.86	.804	48.5	3.02
		0.5	39.5	1.71	.311	37.0	1.77	.408	35.5	1.80	.522	34.5	1.85	.636	33.0	1.89	.692	32.5	1.92	.790	31.0	1.99
		1.0	19.0	1.36	.297	18.5	1.39	.397	18.3	1.40	.493	18.3	1.40	.583	18.0	1.41	.714	17.5	1.44	.797	17.3	1.46
	0.0	0.1	147.0	2.90	.281	135.0	3.32	.423	123.0	3.80	.513	115.0	4.08	.613	106.0	4.39	.694	98.0	4.69	.780	91.0	4.98
		0.25	105.0	1.77	.273	91.5	1.98	.423	84.0	2.11	.503	80.5	2.18	.615	76.0	2.27	.716	70.5	2.38	.803	66.0	2.49
		0.5	66.5	1.24	.275	60.0	1.32	.404	57.0	1.36	.505	54.5	1.40	.606	52.0	1.44	.714	49.0	1.50	.815	46.0	1.55
		1.0	28.8	1.03	.281	28.5	1.04	.393	28.0	1.05	.486	27.8	1.05	.596	27.3	1.07	.692	26.8	1.08	.790	26.3	1.09
	-0.98	0.1	186.0	1.84	.308	182.0	1.93	.416	178.0	2.03	.506	172.0	2.19	.607	163.0	2.42	.691	152.0	2.74	.809	136.0	3.28
		0.25	156.0	1.05	.308	152.5	1.09	.407	147.5	1.15	.502	141.5	1.23	.605	133.0	1.36	.725	120.0	1.56	.801	113.0	1.66
		0.5	90.0	1.00	.300	90.0	1.00	.400	90.0	1.00	.500	90.0	1.00	.600	90.0	1.00	.729	65.0	1.05	.813	80.0	1.09
		1.0	30.3	1.00	.300	30.3	1.00	.400	30.3	1.00	.500	30.3	1.00	.600	30.3	1.00	.700	30.3	1.00	.800	30.3	1.00

ANALYTICAL RESULTS - COLUMN 4

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	326.0	1.33	.300	326.0	1.33	.400	326.0	1.33	.500	326.0	1.33	.606	322.0	1.39	.689	312.0	1.52	.816	293.0	1.77
		0.25	216.0	1.21	.300	216.0	1.21	.400	216.0	1.21	.500	216.0	1.21	.614	210.0	1.26	.701	201.0	1.33	.810	189.0	1.41
		0.5	93.5	1.14	.301	91.5	1.14	.406	90.0	1.16	.503	88.5	1.17	.598	87.0	1.17	.700	65.0	1.20	.795	83.0	1.20
		1.0	27.8	1.08	.300	27.8	1.08	.400	27.5	1.09	.509	27.5	1.09	.600	27.5	1.09	.706	27.3	1.09	.798	27.3	1.09
	0.0	0.1	353.0	1.00	.300	353.0	1.00	.400	353.0	1.00	.500	353.0	1.00	.600	353.0	1.00	.691	353.0	1.00	.799	338.0	1.18
		0.25	244.0	1.00	.300	244.0	1.00	.400	244.0	1.00	.500	244.0	1.00	.600	244.0	1.00	.700	244.0	1.00	.800	244.0	1.00
		0.5	117.0	1.00	.300	117.0	1.00	.400	117.0	1.00	.500	117.0	1.00	.600	117.0	1.00	.700	117.0	1.00	.800	117.0	1.00
		1.0	31.8	1.00	.300	31.8	1.00	.400	31.8	1.00	.500	31.8	1.00	.600	31.8	1.00	.700	31.8	1.00	.800	31.8	1.00
	-0.98	0.1	353.0	1.00	.300	353.0	1.00	.400	353.0	1.00	.500	353.0	1.00	.600	353.0	1.00	.700	353.0	1.00	.800	353.0	1.00
		0.25	244.0	1.00	.300	244.0	1.00	.400	244.0	1.00	.500	244.0	1.00	.600	244.0	1.00	.700	244.0	1.00	.800	244.0	1.00
		0.5	117.0	1.00	.300	117.0	1.00	.400	117.0	1.00	.500	117.0	1.00	.600	117.0	1.00	.700	117.0	1.00	.800	117.0	1.00
		1.0	31.8	1.00	.300	31.8	1.00	.400	31.8	1.00	.500	31.8	1.00	.600	31.8	1.00	.700	31.8	1.00	.800	31.8	1.00
20.	1.0	0.1	257.0	2.30	.293	249.0	2.42	.388	240.0	2.58	.476	231.0	2.73	.615	213.0	3.08	.697	201.0	3.32	.796	186.0	3.56
		0.25	151.0	1.70	.300	140.0	1.79	.407	135.0	1.83	.512	129.0	1.89	.597	124.0	1.93	.701	117.0	2.00	.798	109.0	2.08
		0.5	65.0	1.37	.293	61.5	1.40	.392	60.0	1.41	.487	58.5	1.43	.602	56.5	1.46	.700	55.0	1.48	.802	53.0	1.52
		1.0	24.0	1.18	.298	23.5	1.20	.409	23.3	1.20	.505	23.3	1.20	.609	23.0	1.22	.703	22.8	1.22	.791	22.8	1.22
	0.0	0.1	300.0	1.68	.300	300.0	1.68	.398	294.0	1.76	.502	281.0	1.94	.617	261.0	2.23	.698	245.0	2.49	.811	222.0	2.90
		0.25	219.0	1.18	.313	211.0	1.25	.407	204.0	1.30	.497	197.0	1.35	.604	187.0	1.42	.718	174.0	1.52	.814	161.0	1.62
		0.5	114.0	1.01	.309	110.0	1.04	.405	107.5	1.05	.498	104.5	1.06	.596	101.5	1.08	.710	96.5	1.11	.800	92.5	1.14
		1.0	31.8	1.00	.300	31.8	1.00	.400	31.8	1.00	.500	31.8	1.00	.600	31.8	1.00	.700	31.8	1.00	.800	31.9	1.00
	-0.98	0.1	352.0	1.00	.300	352.0	1.00	.400	352.0	1.00	.500	352.0	1.00	.591	352.0	1.00	.728	334.0	1.23	.796	318.0	1.44
		0.25	244.0	1.00	.300	244.0	1.00	.400	244.0	1.00	.500	244.0	1.00	.600	244.0	1.00	.700	244.0	1.00	.800	244.0	1.00
		0.5	117.0	1.00	.300	117.0	1.00	.400	117.0	1.00	.500	117.0	1.00	.600	117.0	1.00	.700	117.0	1.00	.800	117.0	1.00
		1.0	31.8	1.00	.300	31.8	1.00	.400	31.8	1.00	.500	31.8	1.00	.600	31.8	1.00	.700	31.8	1.00	.800	31.8	1.00
30.	1.0	0.1	180.0	3.68	.292	161.0	4.04	.373	153.0	4.20	.465	144.0	4.38	.594	133.0	4.62	.739	119.0	4.94	.805	113.0	5.08
		0.25	91.5	2.27	.298	80.5	2.44	.394	77.5	2.48	.497	74.5	2.56	.608	71.5	2.60	.701	68.5	2.67	.800	65.0	2.73
		0.5	44.5	1.65	.305	41.0	1.72	.400	40.0	1.76	.494	39.5	1.76	.610	38.5	1.80	.716	37.0	1.84	.806	36.0	1.87
		1.0	20.3	1.32	.312	19.3	1.36	.403	19.3	1.36	.513	19.0	1.38	.600	18.8	1.40	.703	18.5	1.40	.808	18.3	1.42
	0.0	0.1	223.0	2.88	.325	206.0	3.22	.418	196.0	3.40	.505	186.0	3.58	.589	175.0	3.77	.726	157.0	4.12	.797	148.0	4.28
		0.25	151.0	1.70	.285	133.5	1.84	.394	125.5	1.92	.498	118.5	1.98	.605	111.5	2.06	.716	104.0	2.13	.797	98.5	2.21
		0.5	82.5	1.21	.291	74.0	1.27	.399	71.5	1.30	.493	69.0	1.32	.598	66.0	1.35	.706	63.0	1.38	.808	60.0	1.41
		1.0	30.0	1.03	.303	29.8	1.04	.390	29.5	1.04	.487	29.3	1.05	.595	29.0	1.06	.687	28.8	1.05	.798	28.5	1.06
	-0.98	0.1	282.0	1.93	.300	282.0	1.93	.400	282.0	1.93	.505	279.0	1.97	.612	268.0	2.13	.696	253.0	2.36	.816	228.0	2.79
		0.25	236.0	1.06	.300	236.0	1.06	.400	230.0	1.10	.499	222.5	1.16	.609	211.0	1.25	.698	199.0	1.34	.794	184.5	1.44
		0.5	117.0	1.00	.300	117.0	1.00	.400	117.0	1.00	.500	117.0	1.00	.600	117.0	1.00	.706	114.0	1.01	.803	109.0	1.04
		1.0	31.8	1.00	.300	31.8	1.00	.400	31.8	1.00	.500	31.8	1.00	.600	31.8	1.00	.700	31.8	1.00	.800	31.8	1.00

ANALYTICAL RESULTS - COLUMN 5

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	244.0	1.32	.300	244.0	1.32	.400	244.0	1.32	.498	241.0	1.37	.598	234.0	1.50	.714	220.0	1.77	.792	207.0	2.03
		0.25	168.0	1.20	.300	168.0	1.20	.400	168.0	1.20	.494	168.0	1.20	.606	165.0	1.24	.732	161.0	1.28	.815	146.0	1.50
		0.5	109.0	1.13	.300	109.0	1.13	.400	109.0	1.13	.509	108.0	1.14	.604	106.0	1.16	.737	99.0	1.24	.784	97.0	1.26
		1.0	48.0	1.08	.300	48.0	1.08	.400	48.0	1.08	.505	47.5	1.09	.596	47.0	1.10	.699	46.5	1.11	.793	40.0	1.12
	0.0	0.1	265.0	1.00	.300	265.0	1.00	.400	265.0	1.00	.500	265.0	1.00	.600	265.0	1.00	.694	255.0	1.12	.804	235.0	1.48
		0.25	186.0	1.00	.300	186.0	1.00	.400	186.0	1.00	.500	186.0	1.00	.600	186.0	1.00	.700	186.0	1.06	.793	184.0	1.02
		0.5	119.0	1.00	.300	119.0	1.00	.400	119.0	1.00	.500	119.0	1.00	.600	119.0	1.00	.700	119.0	1.00	.800	119.0	1.00
		1.0	53.0	1.00	.300	53.0	1.00	.400	53.0	1.00	.500	53.0	1.00	.600	53.0	1.00	.700	53.0	1.00	.800	53.0	1.00
	-0.98	0.1	265.0	1.00	.300	265.0	1.00	.400	265.0	1.00	.500	265.0	1.00	.600	265.0	1.00	.700	265.0	1.00	.800	265.0	1.00
		0.25	185.0	1.00	.300	186.0	1.00	.400	186.0	1.00	.500	186.0	1.00	.600	186.0	1.00	.700	185.0	1.00	.800	186.0	1.00
		0.5	119.0	1.00	.300	119.0	1.00	.400	119.0	1.00	.500	119.0	1.00	.600	119.0	1.00	.700	119.0	1.00	.800	119.0	1.00
		1.0	53.0	1.00	.300	53.0	1.00	.400	53.0	1.00	.500	53.0	1.00	.600	53.0	1.00	.700	53.0	1.00	.800	53.0	1.00
20.	1.0	0.1	197.0	2.25	.311	183.0	2.58	.417	175.0	2.80	.521	167.0	3.03	.628	158.0	3.31	.698	149.0	3.62	.804	138.0	4.07
		0.25	129.0	1.79	.298	124.0	1.90	.405	121.0	1.96	.500	118.0	2.03	.611	113.0	2.16	.724	105.0	2.35	.806	98.0	2.51
		0.5	83.0	1.44	.313	80.0	1.48	.410	78.0	1.51	.533	75.0	1.56	.603	73.0	1.59	.700	70.0	1.64	.833	66.0	1.72
		1.0	40.5	1.22	.300	40.0	1.24	.405	39.5	1.25	.506	36.5	1.27	.592	38.0	1.27	.693	37.5	1.30	.803	36.5	1.31
	0.0	0.1	229.0	1.59	.314	220.0	1.77	.406	212.0	1.93	.495	204.0	2.09	.629	186.0	2.51	.727	172.0	2.88	.801	161.0	3.21
		0.25	170.0	1.18	.315	162.0	1.27	.408	157.0	1.34	.484	153.0	1.39	.611	144.0	1.53	.724	134.0	1.70	.795	127.0	1.83
		0.5	116.0	1.04	.300	116.0	1.04	.395	114.0	1.06	.486	111.0	1.10	.598	107.0	1.15	.727	99.0	1.24	.798	94.0	1.30
		1.0	53.0	1.00	.300	53.0	1.00	.400	53.0	1.00	.500	53.0	1.00	.600	53.0	1.00	.700	53.0	1.00	.810	52.5	1.01
	-0.98	0.1	265.0	1.00	.300	265.0	1.00	.400	265.0	1.00	.500	265.0	1.00	.619	252.0	1.17	.692	240.0	1.40	.799	219.0	1.79
		0.25	186.0	1.00	.300	186.0	1.00	.400	186.0	1.00	.500	186.0	1.00	.600	186.0	1.00	.700	186.0	1.00	.790	191.0	1.05
		0.5	119.0	1.00	.300	119.0	1.00	.400	119.0	1.00	.500	119.0	1.00	.600	119.0	1.00	.700	119.0	1.00	.800	119.0	1.00
		1.0	53.0	1.00	.300	53.0	1.00	.400	53.0	1.00	.500	53.0	1.00	.600	53.0	1.00	.700	53.0	1.00	.800	53.0	1.00
30.	1.0	0.1	136.0	4.16	.314	121.0	4.91	.441	111.0	5.52	.558	104.0	5.93	.598	102.0	6.04	.692	97.5	6.29	.822	90.0	6.72
		0.25	89.0	2.71	.317	82.0	2.90	.430	79.0	2.99	.539	76.0	3.08	.608	74.0	3.15	.704	71.0	3.24	.818	66.0	3.44
		0.5	59.0	1.86	.313	56.0	1.93	.422	54.5	1.96	.533	52.5	2.02	.598	51.0	2.07	.687	49.5	2.12	.827	46.5	2.21
		1.0	33.0	1.43	.297	32.0	1.47	.397	31.5	1.47	.508	30.5	1.52	.600	30.0	1.53	.695	29.5	1.56	.807	28.5	1.61
	0.0	0.1	170.0	2.94	.297	158.0	3.31	.434	143.0	3.86	.500	136.0	4.16	.603	126.0	4.63	.709	117.0	5.14	.813	107.0	5.77
		0.25	121.0	1.96	.296	108.0	2.28	.398	103.0	2.40	.500	98.0	2.51	.589	95.0	2.57	.711	90.0	2.69	.810	84.0	2.85
		0.5	86.5	1.39	.325	80.0	1.48	.410	78.0	1.51	.497	75.5	1.55	.596	73.0	1.59	.710	69.0	1.66	.800	65.0	1.74
		1.0	49.5	1.06	.313	48.0	1.08	.404	47.0	1.10	.500	46.0	1.12	.600	45.0	1.13	.693	44.0	1.15	.810	42.0	1.19
	-0.99	0.1	219.0	1.79	.304	217.0	1.83	.419	210.0	1.98	.500	204.0	2.09	.606	193.0	2.34	.691	181.0	2.64	.782	165.0	3.09
		0.25	182.0	1.04	.314	175.0	1.12	.406	170.0	1.18	.498	164.5	1.24	.617	154.0	1.38	.715	144.0	1.53	.803	132.0	1.74
		0.5	119.5	1.00	.300	119.5	1.00	.400	119.5	1.00	.500	119.5	1.00	.600	119.5	1.00	.678	116.5	1.04	.807	106.0	1.16
		1.0	53.0	1.00	.300	53.0	1.00	.400	53.0	1.00	.500	53.0	1.00	.600	53.0	1.00	.700	53.0	1.00	.800	53.0	1.00

ANALYTICAL RESULTS - COLUMN 6

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL
10.	1.0	0.1	360.0	1.30	.300	360.0	1.30	.400	360.0	1.30	.500	360.0	1.30	.602	352.0	1.39	.701	338.0	1.57	.812	319.0	1.82
		0.25	240.0	1.20	.300	240.0	1.20	.400	240.0	1.20	.500	240.0	1.20	.594	239.0	1.21	.701	234.0	1.25	.800	225.0	1.32
		0.5	138.0	1.12	.299	137.0	1.13	.407	135.0	1.14	.519	133.0	1.15	.608	130.0	1.17	.701	127.0	1.19	.805	123.0	1.22
		1.0	51.5	1.09	.304	51.0	1.09	.406	50.5	1.10	.510	50.0	1.11	.600	50.0	1.11	.707	49.5	1.11	.796	49.0	1.12
	0.0	0.1	391.0	1.00	.300	391.0	1.00	.400	391.0	1.00	.500	391.0	1.00	.600	391.0	1.00	.694	369.0	.98	.797	370.0	1.18
		0.25	269.0	1.00	.300	269.0	1.00	.400	269.0	1.00	.500	269.0	1.00	.600	269.0	1.00	.700	269.0	1.00	.800	269.0	1.00
		0.5	160.0	1.00	.300	160.0	1.00	.400	160.0	1.00	.500	160.0	1.00	.600	160.0	1.00	.700	160.0	1.00	.800	160.0	1.00
		1.0	57.5	1.00	.300	57.5	1.00	.400	57.5	1.00	.500	57.5	1.00	.600	57.5	1.00	.700	57.5	1.00	.800	57.5	1.00
	-0.98	0.1	391.0	1.00	.300	391.0	1.00	.400	391.0	1.00	.500	391.0	1.00	.600	391.0	1.00	.700	391.0	1.00	.800	391.0	1.00
		0.25	269.0	1.00	.300	269.0	1.00	.400	269.0	1.00	.500	269.0	1.00	.600	269.0	1.00	.700	269.0	1.00	.800	269.0	1.00
		0.5	160.0	1.00	.300	160.0	1.00	.400	160.0	1.00	.500	160.0	1.00	.600	160.0	1.00	.700	160.0	1.00	.800	160.0	1.00
		1.0	57.5	1.00	.300	57.5	1.00	.400	57.5	1.00	.500	57.5	1.00	.600	57.5	1.00	.700	57.5	1.00	.800	57.5	1.00
20.	1.0	0.1	284.0	2.28	.313	268.0	2.53	.416	257.0	2.70	.520	246.0	2.90	.607	234.0	3.13	.694	222.0	3.38	.801	206.0	3.75
		0.25	175.0	1.85	.305	167.0	1.93	.411	163.0	1.97	.513	158.0	2.03	.601	153.0	2.07	.703	145.0	2.17	.801	136.0	2.27
		0.5	98.0	1.42	.312	93.0	1.46	.418	91.0	1.48	.534	88.0	1.53	.605	86.0	1.55	.690	84.0	1.56	.813	80.0	1.62
		1.0	43.5	1.22	.306	42.5	1.25	.405	42.0	1.25	.512	41.0	1.28	.595	41.0	1.28	.713	40.0	1.30	.797	39.5	1.31
	0.0	0.1	333.0	1.63	.304	329.0	1.69	.409	318.0	1.82	.500	306.0	1.98	.613	287.0	2.24	.718	266.0	2.56	.806	247.0	2.88
		0.25	243.0	1.18	.302	232.0	1.27	.411	224.0	1.33	.495	218.0	1.39	.609	207.0	1.49	.697	198.0	1.58	.791	187.0	1.72
		0.5	155.0	1.03	.315	149.0	1.06	.404	146.0	1.08	.497	143.0	1.10	.601	138.0	1.12	.710	131.0	1.17	.803	125.0	1.21
		1.0	57.5	1.00	.300	57.5	1.00	.400	57.5	1.00	.500	57.5	1.00	.600	57.5	1.00	.700	57.5	1.00	.798	57.0	1.01
	-0.98	0.1	391.0	1.00	.300	391.0	1.00	.400	391.0	1.00	.500	391.0	1.00	.600	391.0	1.00	.694	373.0	1.15	.798	347.0	1.46
		0.25	269.0	1.00	.300	269.0	1.00	.400	269.0	1.00	.500	269.0	1.00	.600	269.0	1.00	.700	269.0	1.00	.800	269.0	1.00
		0.5	160.0	1.00	.300	160.0	1.00	.400	160.0	1.00	.500	160.0	1.00	.600	160.0	1.00	.700	160.0	1.00	.800	160.0	1.00
		1.0	57.5	1.00	.300	57.5	1.00	.400	57.5	1.00	.500	57.5	1.00	.600	57.5	1.00	.700	57.5	1.00	.800	57.5	1.00
30.	1.0	0.1	192.0	4.13	.304	171.0	4.73	.404	161.0	4.99	.523	149.0	5.30	.599	142.0	5.51	.689	135.0	5.71	.795	127.0	5.96
		0.25	112.0	2.61	.311	103.0	2.75	.424	99.0	2.83	.537	95.0	2.90	.602	93.0	2.92	.708	89.0	3.04	.800	85.0	3.11
		0.5	63.0	1.80	.310	63.0	1.83	.415	61.5	1.92	.521	59.5	1.97	.598	58.5	1.98	.708	56.5	2.03	.807	54.5	2.09
		1.0	36.0	1.41	.309	34.0	1.47	.418	33.5	1.47	.515	33.0	1.50	.600	32.5	1.52	.714	31.5	1.55	.790	31.0	1.58
	0.0	0.1	243.0	2.95	.296	230.0	3.21	.423	213.0	3.58	.505	202.0	3.85	.603	189.0	4.22	.709	175.0	4.63	.807	161.0	4.99
		0.25	163.0	1.97	.306	144.0	2.18	.399	138.0	2.25	.492	132.0	2.32	.603	126.0	2.40	.694	121.0	2.47	.807	114.0	2.58
		0.5	107.5	1.33	.303	99.0	1.41	.414	95.5	1.45	.511	92.0	1.48	.592	89.5	1.50	.702	85.5	1.55	.793	82.0	1.60
		1.0	54.0	1.05	.298	52.0	1.08	.402	51.0	1.09	.485	50.5	1.10	.596	49.5	1.11	.691	48.5	1.13	.809	47.0	1.16
	-0.98	0.1	313.0	1.89	.300	313.0	1.89	.400	313.0	1.89	.500	306.0	1.98	.603	295.0	2.13	.723	274.0	2.43	.798	257.0	2.70
		0.25	261.0	1.05	.306	255.0	1.09	.403	248.0	1.15	.498	241.0	1.20	.600	230.0	1.28	.693	216.0	1.39	.788	203.0	1.53
		0.5	160.5	1.00	.300	160.5	1.00	.400	160.5	1.00	.500	160.5	1.00	.602	159.5	1.00	.723	151.5	1.04	.801	145.5	1.08
		1.0	57.5	1.00	.300	57.5	1.00	.400	57.5	1.00	.500	57.5	1.00	.600	57.5	1.00	.700	57.5	1.00	.800	57.5	1.00

ANALYTICAL RESULTS - COLUMN 7

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	254.0	1.32	.300	254.0	1.32	.400	254.0	1.32	.500	254.0	1.32	.607	247.0	1.47	.695	239.0	1.63	.806	222.0	2.00
		0.25	186.0	1.18	.300	186.0	1.18	.400	186.0	1.18	.500	186.0	1.18	.603	183.0	1.22	.753	178.0	1.28	.787	174.0	1.34
		0.5	126.0	1.12	.300	126.0	1.12	.400	126.0	1.12	.500	126.0	1.12	.600	126.0	1.12	.713	122.0	1.17	.786	117.0	1.23
		1.0	61.0	1.07	.303	61.0	1.07	.405	60.5	1.07	.500	60.0	1.09	.600	60.0	1.09	.712	59.0	1.10	.795	58.5	1.11
	0.0	0.1	273.0	1.00	.300	273.0	1.00	.400	273.0	1.00	.500	273.0	1.00	.601	273.0	1.00	.718	262.0	1.15	.799	249.0	1.41
		0.25	201.0	1.00	.300	201.0	1.00	.400	201.0	1.00	.500	201.0	1.00	.600	201.0	1.00	.700	201.0	1.00	.800	201.0	1.00
		0.5	136.0	1.00	.300	136.0	1.00	.400	136.0	1.00	.500	136.0	1.00	.600	136.0	1.00	.700	136.0	1.00	.800	136.0	1.00
		1.0	66.0	1.00	.300	66.0	1.00	.400	66.0	1.00	.500	66.0	1.00	.600	66.0	1.00	.700	66.0	1.00	.800	66.0	1.00
	-0.99	0.1	273.0	1.00	.300	273.0	1.00	.400	273.0	1.00	.500	273.0	1.00	.600	273.0	1.00	.700	273.0	1.00	.800	273.0	1.00
		0.25	201.0	1.00	.300	201.0	1.00	.400	201.0	1.00	.500	201.0	1.00	.600	201.0	1.00	.700	201.0	1.00	.800	201.0	1.00
		0.5	136.0	1.00	.300	136.0	1.00	.400	136.0	1.00	.500	136.0	1.00	.600	136.0	1.00	.700	136.0	1.00	.800	136.0	1.00
		1.0	66.0	1.00	.300	66.0	1.00	.400	66.0	1.00	.500	66.0	1.00	.600	66.0	1.00	.700	66.0	1.00	.600	66.0	1.00
20.	1.0	0.1	213.0	2.21	.304	204.0	2.44	.404	198.0	2.60	.500	192.0	2.77	.617	180.0	3.13	.710	169.0	3.51	.792	159.0	3.91
		0.25	151.0	1.70	.299	147.0	1.77	.396	144.0	1.83	.489	141.0	1.90	.615	135.0	2.03	.705	129.0	2.17	.800	120.0	2.39
		0.5	102.0	1.40	.310	100.0	1.42	.408	98.0	1.45	.516	95.0	1.49	.609	92.0	1.53	.705	88.0	1.59	.795	83.0	1.67
		1.0	52.5	1.20	.308	52.0	1.21	.402	51.0	1.22	.505	50.5	1.24	.606	49.5	1.26	.701	48.5	1.28	.800	47.5	1.29
	0.0	0.1	241.0	1.58	.297	236.0	1.69	.402	229.0	1.84	.498	221.0	2.01	.617	206.0	2.39	.717	191.0	2.80	.803	178.0	3.20
		0.25	189.0	1.14	.297	185.0	1.19	.398	181.0	1.24	.494	176.0	1.31	.611	167.0	1.43	.709	158.0	1.57	.804	148.0	1.75
		0.5	135.0	1.01	.300	135.0	1.01	.393	135.0	1.01	.496	133.0	1.04	.597	129.0	1.09	.725	120.0	1.20	.813	112.0	1.28
		1.0	66.0	1.00	.300	66.0	1.00	.400	66.0	1.00	.500	66.0	1.00	.600	66.0	1.00	.700	66.0	1.00	.800	66.0	1.00
	-0.99	0.1	273.0	1.00	.300	273.0	1.00	.399	273.0	1.00	.506	271.0	.99	.605	263.0	1.13	.720	246.0	1.47	.805	231.0	1.80
		0.25	201.0	1.00	.300	201.0	1.00	.400	201.0	1.00	.500	201.0	1.00	.600	201.0	1.00	.701	201.0	1.00	.795	200.0	1.02
		0.5	136.0	1.00	.300	136.0	1.00	.400	136.0	1.00	.500	135.0	1.00	.600	136.0	1.00	.700	136.0	1.00	.600	136.0	1.00
		1.0	66.0	1.00	.300	66.0	1.00	.400	66.0	1.00	.500	66.0	1.00	.500	66.0	1.00	.700	66.0	1.00	.800	66.0	1.00
30.	1.0	0.1	165.0	3.66	.329	146.0	4.48	.442	138.0	4.89	.562	130.0	5.35	.589	129.0	5.43	.717	120.0	5.98	.804	112.0	6.41
		0.25	113.0	2.54	.305	105.0	2.73	.412	102.0	2.80	.515	99.0	2.87	.604	96.0	2.95	.696	92.0	3.07	.791	88.0	3.25
		0.5	78.5	1.75	.313	73.5	1.85	.420	71.5	1.89	.525	69.5	1.93	.613	68.0	1.97	.727	64.0	2.06	.790	62.0	2.11
		1.0	43.5	1.39	.302	43.0	1.40	.408	42.2	1.42	.512	41.0	1.45	.593	40.5	1.47	.709	39.5	1.50	.805	38.5	1.53
	0.0	0.1	193.0	2.74	.303	178.0	3.20	.428	166.0	3.62	.509	159.0	3.91	.603	151.0	4.25	.719	139.0	4.85	.806	129.0	5.43
		0.25	148.0	1.75	.296	135.0	2.03	.414	128.0	2.20	.500	124.0	2.29	.597	119.0	2.41	.699	113.0	2.54	.810	105.0	2.73
		0.5	108.0	1.33	.293	102.5	1.39	.395	100.0	1.42	.497	97.5	1.46	.601	94.0	1.51	.712	88.5	1.59	.806	82.5	1.68
		1.0	64.0	1.03	.296	62.5	1.05	.398	61.5	1.06	.496	60.5	1.07	.597	59.5	1.09	.704	57.5	1.12	.793	55.5	1.15
	-0.99	0.1	241.0	1.58	.296	226.0	1.90	.402	219.0	2.07	.498	213.0	2.21	.593	204.0	2.44	.705	190.0	2.83	.805	174.0	3.34
		0.25	200.0	1.02	.306	196.0	1.06	.401	192.0	1.11	.500	186.0	1.18	.601	178.0	1.28	.701	167.0	1.43	.804	153.0	1.67
		0.5	136.0	1.00	.300	136.0	1.00	.400	136.0	1.00	.500	136.0	1.00	.600	136.0	1.00	.691	135.0	1.00	.816	125.0	1.13
		1.0	66.0	1.00	.300	66.0	1.00	.400	66.0	1.00	.500	66.0	1.00	.600	66.0	1.00	.700	66.0	1.00	.800	66.0	1.00

ANALYTICAL RESULTS - COLUMN 8

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	370.0	1.32	.300	370.0	1.32	.400	370.0	1.32	.500	370.0	1.32	.598	368.0	1.36	.699	356.0	1.51	.804	341.0	1.71
		0.25	263.0	1.19	.300	263.0	1.19	.400	263.0	1.19	.500	263.0	1.19	.600	263.0	1.19	.684	263.0	1.19	.802	253.0	1.27
		0.5	162.0	1.11	.302	162.0	1.11	.404	161.0	1.12	.513	158.0	1.13	.596	156.0	1.14	.704	152.0	1.17	.810	147.0	1.20
		1.0	64.5	1.08	.302	64.5	1.08	.406	64.0	1.09	.500	64.0	1.09	.598	63.5	1.09	.698	63.0	1.10	.792	62.5	1.11
	0.0	0.1	400.0	1.00	.300	400.0	1.00	.400	400.0	1.00	.500	400.0	1.00	.600	400.0	1.00	.690	400.0	1.00	.804	382.0	1.17
		0.25	288.0	1.00	.300	288.0	1.00	.400	288.0	1.00	.500	288.0	1.00	.600	288.0	1.00	.700	288.0	1.00	.800	288.0	1.00
		0.5	181.0	1.00	.300	181.0	1.00	.400	181.0	1.00	.500	181.0	1.00	.600	181.0	1.00	.700	181.0	1.00	.800	181.0	1.00
		1.0	71.0	1.00	.300	71.0	1.00	.400	71.0	1.00	.500	71.0	1.00	.600	71.0	1.00	.700	71.0	1.00	.800	71.0	1.00
	-0.98	0.1	400.0	1.00	.300	400.0	1.00	.400	400.0	1.00	.500	400.0	1.00	.600	400.0	1.00	.700	400.0	1.00	.800	400.0	1.00
		0.25	288.0	1.00	.300	288.0	1.00	.400	288.0	1.00	.500	288.0	1.00	.600	288.0	1.00	.700	288.0	1.00	.800	288.0	1.00
		0.5	181.0	1.00	.300	181.0	1.00	.400	181.0	1.00	.500	181.0	1.00	.600	181.0	1.00	.700	181.0	1.00	.800	181.0	1.00
		1.0	71.0	1.00	.300	71.0	1.00	.400	71.0	1.00	.500	71.0	1.00	.600	71.0	1.00	.700	71.0	1.00	.800	71.0	1.00
20.	1.0	0.1	302.0	2.28	.301	292.0	2.43	.401	284.0	2.58	.504	274.0	2.76	.607	262.0	2.98	.699	249.0	3.26	.795	234.0	3.61
		0.25	204.0	1.77	.296	199.0	1.83	.395	195.0	1.87	.492	191.0	1.91	.607	183.0	1.99	.703	175.0	2.07	.805	164.0	2.19
		0.5	124.0	1.37	.308	117.0	1.43	.409	115.0	1.44	.513	113.0	1.47	.600	110.0	1.49	.698	106.0	1.53	.794	102.0	1.57
		1.0	55.0	1.21	.300	55.0	1.21	.404	54.5	1.21	.505	53.5	1.23	.594	53.0	1.23	.695	52.5	1.25	.806	51.5	1.26
	0.0	0.1	347.0	1.63	.302	344.0	1.67	.403	335.0	1.79	.505	323.0	1.96	.604	308.0	2.19	.720	286.0	2.54	.796	270.0	2.83
		0.25	266.0	1.16	.308	260.0	1.21	.402	254.0	1.26	.492	248.0	1.31	.605	238.0	1.40	.717	225.0	1.52	.808	214.0	1.65
		0.5	180.0	1.01	.302	179.0	1.01	.400	175.0	1.04	.488	172.0	1.05	.599	167.0	1.08	.711	159.0	1.13	.813	150.0	1.18
		1.0	71.0	1.00	.300	71.0	1.00	.400	71.0	1.00	.500	71.0	1.00	.600	71.0	1.00	.700	71.0	1.00	.800	71.0	1.00
	-0.98	0.1	400.0	1.00	.300	400.0	1.00	.400	400.0	1.00	.500	400.0	1.00	.593	398.0	.97	.726	376.0	1.24	.794	360.0	1.46
		0.25	288.0	1.00	.300	288.0	1.00	.400	288.0	1.00	.500	288.0	1.00	.600	288.0	1.00	.706	288.0	1.00	.800	288.0	1.00
		0.5	181.0	1.00	.300	181.0	1.00	.400	181.0	1.00	.500	181.0	1.00	.600	181.0	1.00	.700	181.0	1.00	.800	181.0	1.00
		1.0	71.0	1.00	.300	71.0	1.00	.400	71.0	1.00	.500	71.0	1.00	.600	71.0	1.00	.700	71.0	1.00	.800	71.0	1.00
30.	1.0	0.1	226.0	3.81	.332	199.0	4.57	.455	187.0	4.87	.574	176.0	5.15	.598	174.0	5.20	.697	165.0	5.45	.805	154.0	5.78
		0.25	143.0	2.46	.311	132.0	2.61	.414	128.0	2.68	.522	123.5	2.75	.595	121.0	2.78	.713	115.0	2.89	.807	109.0	3.01
		0.5	90.0	1.71	.315	84.0	1.80	.421	82.0	1.83	.528	79.5	1.87	.606	77.5	1.91	.695	75.5	1.93	.807	72.5	1.99
		1.0	45.5	1.38	.300	45.0	1.40	.404	44.5	1.41	.500	44.0	1.41	.598	43.5	1.43	.706	42.5	1.45	.786	42.0	1.46
	0.0	0.1	269.0	2.85	.328	247.0	3.30	.414	237.0	3.54	.498	227.0	3.78	.603	214.0	4.14	.714	199.0	4.57	.805	185.0	4.92
		0.25	198.0	1.84	.298	178.0	2.04	.398	171.0	2.12	.500	164.0	2.19	.591	159.0	2.25	.702	151.0	2.35	.797	143.0	2.46
		0.5	137.0	1.27	.324	126.5	1.35	.411	123.0	1.38	.492	120.0	1.40	.595	116.0	1.43	.709	110.0	1.49	.792	106.0	1.53
		1.0	68.5	1.03	.304	67.5	1.05	.396	67.0	1.05	.485	66.0	1.06	.592	65.0	1.08	.701	63.5	1.09	.792	62.5	1.11
	-0.98	0.1	338.0	1.75	.290	328.0	1.89	.423	319.0	2.02	.500	314.0	2.09	.597	305.0	2.23	.695	292.0	2.43	.793	270.0	2.83
		0.25	282.0	1.04	.305	279.0	1.07	.401	274.0	1.10	.499	266.5	1.16	.599	257.0	1.24	.705	244.0	1.35	.806	227.0	1.51
		0.5	181.5	1.00	.300	181.5	1.00	.400	181,5	1.00	.500	181.5	1.00	.600	181.5	1.00	.689	181.5	1.00	.793	173.0	1.04
		1.0	71.0	1.00	.300	71.0	1.00	.400	71.0	1.00	.500	71.0	1.00	.600	71.0	1.00	.700	71.0	1.00	.800	71.0	1.00

ANALYTICAL RESULTS - COLUMN 9

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	285.0	1.29	.300	285.0	1.29	.400	285.0	1.29	.496	282.0	1.33	.608	273.0	1.48	.700	263.0	1.66	.794	248.0	1.94
		0.25	200.0	1.19	.300	200.0	1.19	.400	200.0	1.19	.495	200.0	1.19	.609	197.0	1.23	.699	193.0	1.27	.788	164.0	1.38
		0.5	133.0	1.13	.300	133.0	1.13	.400	133.0	1.13	.500	133.0	1.13	.600	133.0	1.13	.699	133.0	1.13	.787	127.0	1.20
		1.0	73.0	1.06	.303	72.5	1.07	.403	72.0	1.07	.510	71.5	1.08	.599	71.0	1.09	.712	69.5	1.11	.801	68.0	1.13
	0.0	0.1	308.0	1.00	.300	308.0	1.00	.400	308.0	1.00	.500	308.0	1.00	.601	308.0	1.00	.724	294.0	1.15	.800	280.0	1.36
		0.25	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	.500	220.0	1.00	.600	220.0	1.00	.700	220.0	1.00	.800	220.0	1.00
		0.5	144.0	1.00	.300	144.0	1.00	.400	144.0	1.00	.500	144.0	1.00	.600	144.0	1.00	.700	144.0	1.00	.800	144.0	1.00
		1.0	78.0	1.00	.300	78.0	1.00	.400	78.0	1.00	.500	78.0	1.00	.600	78.0	1.00	.700	78.0	1.00	.800	78.0	1.00
	-0.98	0.1	308.0	1.00	.300	308.0	1.00	.400	308.0	1.00	.500	308.0	1.00	.600	308.0	1.00	.700	308.0	1.00	.800	308.0	1.00
		0.25	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	.500	220.0	1.00	.600	220.0	1.00	.700	220.0	1.00	.800	220.0	1.00
		0.5	144.0	1.00	.300	144.0	1.00	.400	144.0	1.00	.500	144.0	1.00	.600	144.0	1.00	.700	144.0	1.00	.800	144.0	1.00
		1.0	78.0	1.00	.300	78.0	1.00	.400	78.0	1.00	.500	78.0	1.00	.600	78.0	1.00	.700	78.0	1.00	.800	78.0	1.00
20.	1.0	0.1	234.0	2.21	.314	220.0	2.50	.415	212.0	2.68	.512	205.0	2.85	.598	199.0	3.02	.740	181.0	3.54	.799	174.0	3.77
		0.25	159.0	1.74	.305	154.0	1.82	.397	151.0	1.88	.500	148.0	1.93	.604	144.0	2.01	.715	137.0	2.16	.798	129.0	2.35
		0.5	108.0	1.49	.296	108.0	1.49	.406	106.0	1.52	.500	104.0	1.55	.598	102.0	1.58	.719	95.0	1.68	.802	91.0	1.76
		1.0	61.0	1.23	.306	60.5	1.24	.403	59.5	1.25	.513	58.5	1.27	.600	57.5	1.29	.690	56.5	1.31	.815	54.0	1.36
	0.0	0.1	270.0	1.54	.310	261.0	1.70	.409	252.0	1.87	.498	243.0	2.03	.603	232.0	2.25	.704	216.0	2.59	.796	201.0	2.96
		0.25	204.0	1.15	.310	197.0	1.23	.406	192.0	1.28	.495	189.0	1.33	.602	181.0	1.42	.718	170.0	1.56	.800	160.0	1.72
		0.5	142.0	1.03	.300	142.0	1.03	.387	142.0	1.03	.486	140.0	1.05	.591	137.0	1.08	.710	131.0	1.15	.811	122.0	1.27
		1.0	78.0	1.00	.300	78.0	1.00	.400	78.0	1.00	.500	78.0	1.00	.600	78.0	1.00	.699	78.0	1.00	.804	76.5	1.02
	-0.98	0.1	308.0	1.00	.300	308.0	1.00	.399	308.0	1.00	.502	307.0	.96	.616	294.0	1.15	.718	277.0	1.42	.809	256.0	1.79
		0.25	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	.500	220.0	1.00	.600	220.0	1.00	.700	220.0	1.00	.809	215.0	1.05
		0.5	144.0	1.00	.300	144.0	1.00	.400	144.0	1.00	.500	144.0	1.00	.600	144.0	1.00	.700	144.0	1.00	.800	144.0	1.00
		1.0	78.0	1.00	.300	78.0	1.00	.400	78.0	1.00	.500	78.0	1.00	.600	78.0	1.00	.700	78.0	1.00	.800	78.0	1.00
30.	1.0	0.1	168.0	3.98	.316	154.0	4.56	.444	144.0	5.03	.578	135.0	5.51	.597	134.0	5.56	.709	127.0	5.99	.795	122.0	6.34
		0.25	115.0	2.75	.315	108.0	2.98	.429	105.0	3.08	.529	102.0	3.17	.600	100.0	3.22	.701	97.0	3.32	.785	93.0	3.45
		0.5	83.0	1.90	.316	79.0	1.98	.416	77.0	2.03	.533	75.0	2.08	.603	73.0	2.12	.690	71.0	2.17	.793	67.5	2.20
		1.0	49.0	1.47	.299	48.5	1.47	.411	47.5	1.50	.516	46.5	1.53	.587	46.0	1.54	.708	44.5	1.58	.814	43.0	1.63
	0.0	0.1	205.0	2.85	.321	193.0	3.18	.420	181.0	3.54	.503	171.0	3.88	.596	161.0	4.26	.707	156.0	4.73	.803	142.0	5.13
		0.25	152.0	1.86	.317	139.0	2.12	.414	133.0	2.25	.496	129.0	2.35	.597	124.0	2.48	.697	119.0	2.62	.813	112.0	2.84
		0.5	111.0	1.43	.318	105.5	1.53	.401	103.5	1.56	.480	102.0	1.58	.596	99.0	1.63	.705	95.0	1.69	.799	89.5	1.78
		1.0	73.0	1.06	.310	71.0	1.09	.403	69.5	1.11	.489	68.5	1.12	.602	66.5	1.15	.692	65.0	1.16	.798	62.0	1.21
	-0.98	0.1	264.0	1.64	.305	259.0	1.74	.424	250.0	1.90	.494	243.0	2.03	.572	236.0	2.17	.683	221.0	2.48	.803	198.0	3.04
		0.25	216.0	1.04	.308	211.0	1.08	.410	205.0	1.14	.495	200.0	1.19	.607	191.0	1.29	.719	176.0	1.45	.788	170.0	1.56
		0.5	144.0	1.00	.300	144.0	1.00	.400	144.0	1.00	.500	144.0	1.00	.600	144.0	1.00	.688	144.0	1.00	.794	136.0	1.09
		1.0	78.0	1.00	.300	78.0	1.00	.400	78.0	1.00	.500	78.0	1.00	.600	78.0	1.00	.700	78.0	1.00	.800	78.0	1.00

ANALYTICAL RESULTS - COLUMN 10

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	398.0	1.30	.300	398.0	1.30	.400	398.0	1.30	.497	398.0	1.30	.600	390.0	1.38	.700	377.0	1.54	.812	357.0	1.79
		0.25	274.0	1.19	.300	274.0	1.19	.400	274.0	1.19	.496	274.0	1.19	.597	273.0	1.20	.705	266.0	1.23	.808	260.0	1.33
		0.5	176.0	1.13	.300	176.0	1.13	.400	176.0	1.13	.500	176.0	1.13	.613	173.0	1.15	.710	169.0	1.18	.804	163.0	1.22
		1.0	77.5	1.08	.303	77.5	1.08	.403	77.0	1.08	.510	76.5	1.09	.599	76.0	1.09	.702	75.5	1.10	.787	75.0	1.11
	0.0	0.1	432.0	1.00	.300	432.0	1.00	.400	432.0	1.00	.500	432.0	1.00	.600	432.0	1.00	.693	430.0	.96	.808	407.0	1.19
		0.25	303.0	1.00	.300	303.0	1.00	.400	303.0	1.00	.500	303.0	1.00	.600	303.0	1.00	.700	303.0	1.00	.800	303.0	1.00
		0.5	193.0	1.00	.300	193.0	1.00	.400	193.0	1.00	.500	193.0	1.00	.600	193.0	1.00	.700	193.0	1.00	.800	193.0	1.00
		1.0	86.0	1.00	.300	86.0	1.00	.400	86.0	1.00	.500	86.0	1.00	.600	86.0	1.00	.700	86.0	1.00	.800	86.0	1.00
	-0.95	0.1	432.0	1.00	.300	432.0	1.00	.400	432.0	1.00	.500	432.0	1.00	.600	432.0	1.00	.700	432.0	1.00	.800	432.0	1.00
		0.25	303.0	1.00	.300	303.0	1.00	.400	303.0	1.00	.500	303.0	1.00	.600	303.0	1.00	.700	303.0	1.00	.800	303.0	1.00
		0.5	193.0	1.00	.300	193.0	1.00	.400	193.0	1.00	.500	193.0	1.00	.600	193.0	1.00	.700	193.0	1.00	.800	193.0	1.00
		1.0	86.0	1.00	.300	86.0	1.00	.400	86.0	1.00	.500	86.0	1.00	.600	86.0	1.00	.700	86.0	1.00	.800	86.0	1.00
20.	1.0	0.1	320.0	2.26	.315	302.0	2.52	.416	291.0	2.69	.516	281.0	2.85	.601	271.0	3.03	.710	255.0	3.35	.801	241.0	3.64
		0.25	209.0	1.80	.302	202.0	1.88	.404	198.0	1.94	.500	194.0	1.99	.603	189.0	2.07	.713	181.0	2.19	.797	172.0	2.32
		0.5	135.0	1.42	.318	129.0	1.48	.421	126.0	1.51	.528	123.0	1.53	.595	121.0	1.55	.707	116.0	1.60	.795	112.0	1.65
		1.0	65.0	1.23	.302	64.5	1.23	.402	63.5	1.25	.512	62.5	1.27	.597	62.0	1.27	.702	60.5	1.29	.798	59.5	1.31
	0.0	0.1	373.0	1.58	.301	365.0	1.68	.409	352.0	1.85	.497	342.0	1.97	.608	324.0	2.20	.711	304.0	2.48	.806	283.0	2.82
		0.25	277.0	1.17	.307	267.0	1.24	.404	260.0	1.30	.494	253.0	1.35	.598	244.0	1.43	.704	233.0	1.53	.796	221.0	1.66
		0.5	188.0	1.04	.298	188.0	1.04	.390	187.0	1.05	.497	183.0	1.08	.601	178.0	1.11	.702	171.0	1.16	.801	161.0	1.23
		1.0	86.0	1.00	.300	86.0	1.00	.400	86.0	1.00	.500	86.0	1.00	.600	86.0	1.00	.700	86.0	1.00	.807	85.5	1.00
	-0.98	0.1	432.0	1.00	.300	432.0	1.00	.400	432.0	1.00	.500	432.0	1.00	.594	429.0	.96	.698	410.0	1.16	.793	386.0	1.42
		0.25	303.0	1.00	.300	303.0	1.00	.400	303.0	1.00	.500	303.0	1.00	.600	303.0	1.00	.700	303.0	1.00	.800	303.0	1.00
		0.5	193.0	1.00	.300	193.0	1.00	.400	193.0	1.00	.500	193.0	1.00	.600	193.0	1.00	.700	193.0	1.00	.800	193.0	1.00
		1.0	86.0	1.00	.300	86.0	1.00	.400	86.0	1.00	.500	86.0	1.00	.600	86.0	1.00	.700	86.0	1.00	.800	86.0	1.00
30.	1.0	0.1	220.0	4.18	.308	201.0	4.75	.418	189.0	5.17	.542	177.0	5.61	.595	173.0	5.76	.697	165.0	6.03	.803	157.0	6.30
		0.25	144.0	2.71	.311	135.0	2.85	.423	130.0	2.94	.540	126.0	3.01	.602	123.0	3.07	.692	120.0	3.13	.805	113.0	3.27
		0.5	95.0	1.86	.308	91.0	1.93	.416	89.0	1.96	.523	86.0	2.00	.595	84.0	2.03	.704	81.0	2.09	.785	79.0	2.13
		1.0	53.0	1.43	.301	51.5	1.46	.406	50.5	1.49	.510	50.0	1.49	.602	49.0	1.51	.691	48.5	1.54	.809	47.0	1.58
	0.0	0.1	276.0	2.94	.302	262.0	3.20	.426	244.0	3.57	.504	232.0	3.86	.601	218.0	4.23	.698	205.0	4.61	.797	192.0	5.04
		0.25	195.0	1.98	.311	177.0	2.24	.420	169.0	2.36	.503	163.0	2.44	.595	158.0	2.50	.697	152.0	2.59	.800	145.0	2.69
		0.5	139.0	1.39	.305	131.0	1.46	.409	127.0	1.50	.490	124.5	1.52	.600	120.0	1.57	.698	116.0	1.60	.800	110.0	1.67
		1.0	79.5	1.06	.301	78.0	1.07	.399	76.5	1.09	.493	75.0	1.11	.592	73.5	1.12	.688	72.0	1.14	.800	70.0	1.16
	-0.98	0.1	356.0	1.80	.301	356.0	1.80	.409	347.0	1.91	.496	341.0	1.98	.596	329.0	2.14	.701	311.0	2.38	.802	288.0	2.74
		0.25	295.0	1.05	.309	288.0	1.09	.402	281.0	1.14	.496	274.0	1.19	.601	263.0	1.27	.700	250.0	1.38	.806	232.0	1.54
		0.5	193.0	1.00	.300	193.0	1.00	.400	193.0	1.00	.500	193.0	1.00	.600	193.0	1.00	.689	193.0	1.00	.802	182.0	1.09
		1.0	86.0	1.00	.300	86.0	1.00	.400	86.0	1.00	.500	86.0	1.00	.600	86.0	1.00	.700	86.0	1.00	.800	86.0	1.00

ANALYTICAL RESULTS - COLUMN 11

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	299.0	1.27	.300	299.0	1.27	.400	299.0	1.27	.492	299.0	1.27	.615	291.0	1.43	.702	282.0	1.61	.787	272.0	1.81
		0.25	223.0	1.17	.300	223.0	1.17	.400	223.0	1.17	.500	223.0	1.17	.596	223.0	1.17	.703	219.0	1.22	.793	208.0	1.35
		0.5	155.0	1.11	.300	155.0	1.11	.400	155.0	1.11	.500	155.0	1.11	.600	155.0	1.11	.700	155.0	1.11	.807	150.0	1.17
		1.0	90.5	1.06	.298	90.5	1.06	.400	90.0	1.06	.506	90.0	1.06	.607	89.0	1.07	.709	87.5	1.09	.797	86.0	1.10
	0.0	0.1	320.0	1.00	.300	320.0	1.00	.400	320.0	1.00	.500	320.0	1.00	.600	320.0	1.00	.713	310.0	1.09	.792	298.0	1.30
		0.25	239.0	1.00	.300	239.0	1.00	.400	239.0	1.00	.500	239.0	1.00	.600	239.0	1.00	.700	239.0	1.00	.800	239.0	1.00
		0.5	165.0	1.00	.300	165.0	1.00	.400	165.0	1.00	.500	165.0	1.00	.600	165.0	1.00	.700	165.0	1.00	.800	165.0	1.00
		1.0	96.0	1.00	.300	96.0	1.00	.400	96.0	1.00	.500	96.0	1.00	.600	96.0	1.00	.700	96.0	1.00	.800	96.0	1.00
	-0.98	0.1	320.0	1.00	.300	320.0	1.00	.400	320.0	1.00	.500	320.0	1.00	.600	320.0	1.00	.700	320.0	1.00	.800	320.0	1.00
		0.25	239.0	1.00	.300	239.0	1.00	.400	239.0	1.00	.500	239.0	1.00	.600	239.0	1.00	.700	239.0	1.00	.800	239.0	1.00
		0.5	165.0	1.00	.300	165.0	1.00	.400	165.0	1.00	.500	165.0	1.00	.600	165.0	1.00	.700	165.0	1.00	.800	165.0	1.00
		1.0	96.0	1.00	.300	96.0	1.00	.400	96.0	1.00	.500	96.0	1.00	.600	96.0	1.00	.700	96.0	1.00	.800	96.0	1.00
20.	1.0	0.1	255.0	2.16	.304	247.0	2.34	.398	241.0	2.47	.494	235.0	2.62	.606	226.0	2.85	.722	212.0	3.25	.808	198.0	3.70
		0.25	186.0	1.65	.297	182.0	1.71	.394	180.0	1.74	.492	177.0	1.80	.605	172.0	1.88	.718	163.0	2.06	.790	157.0	2.18
		0.5	131.0	1.43	.300	131.0	1.43	.397	131.0	1.43	.492	130.0	1.45	.606	127.0	1.50	.717	120.0	1.61	.814	113.0	1.71
		1.0	78.5	1.20	.303	77.5	1.21	.405	76.5	1.22	.507	76.0	1.23	.600	75.0	1.24	.703	72.5	1.28	.800	70.0	1.32
	0.0	0.1	288.0	1.49	.302	281.0	1.63	.407	273.0	1.79	.496	266.0	1.93	.602	256.0	2.13	.718	238.0	2.55	.810	221.0	2.99
		0.25	223.0	1.12	.298	225.0	1.15	.398	221.0	1.19	.493	217.0	1.24	.600	210.0	1.32	.709	199.0	1.46	.798	188.0	1.62
		0.5	165.0	1.00	.300	165.0	1.00	.400	165.0	1.00	.491	165.0	1.00	.591	164.0	1.02	.724	156.0	1.10	.805	149.0	1.18
		1.0	96.0	1.00	.300	96.0	1.00	.400	96.0	1.00	.500	96.0	1.00	.600	96.0	1.00	.700	96.0	1.00	.800	96.0	1.00
	-0.98	0.1	320.0	1.00	.300	320.0	1.00	.400	320.0	1.00	.506	316.0	.98	.604	308.0	1.12	.699	296.0	1.33	.795	278.0	1.68
		0.25	239.0	1.00	.300	239.0	1.00	.400	239.0	1.00	.500	239.0	1.00	.600	239.0	1.00	.700	239.0	1.00	.800	239.0	1.00
		0.5	165.0	1.00	.300	165.0	1.00	.400	165.0	1.00	.500	165.0	1.00	.600	165.0	1.00	.700	165.0	1.00	.800	165.0	1.00
		1.0	96.0	1.00	.300	96.0	1.00	.400	96.0	1.00	.500	96.0	1.00	.600	96.0	1.00	.700	96.0	1.00	.800	96.0	1.00
30.	1.0	0.1	206.0	3.43	.326	187.0	4.09	.436	179.0	4.41	.544	171.0	4.75	.599	167.0	4.94	.689	161.0	5.25	.789	152.0	5.73
		0.25	146.0	2.44	.307	137.0	2.67	.410	134.0	2.77	.504	131.0	2.86	.602	128.0	2.96	.702	124.0	3.09	.795	117.0	3.31
		0.5	105.0	1.84	.304	102.0	1.89	.400	100.0	1.92	.500	98.0	1.96	.604	96.0	2.00	.717	92.0	2.08	.805	87.0	2.19
		1.0	66.0	1.39	.305	64.0	1.43	.405	63.0	1.45	.508	62.0	1.47	.598	61.0	1.49	.692	60.0	1.50	.784	58.0	1.55
	0.0	0.1	238.0	2.55	.306	222.0	2.95	.415	212.0	3.25	.502	203.0	3.53	.601	193.0	3.87	.692	185.0	4.17	.807	171.0	4.75
		0.25	186.0	1.65	.302	172.0	1.89	.416	166.0	2.00	.494	162.0	2.08	.596	156.0	2.21	.689	151.0	2.32	.801	141.0	2.57
		0.5	133.0	1.33	.301	133.0	1.40	.397	131.0	1.43	.500	128.0	1.48	.587	126.0	1.51	.717	120.0	1.61	.795	114.5	1.69
		1.0	92.5	1.04	.301	91.5	1.05	.400	90.0	1.06	.489	89.0	1.07	.598	87.0	1.09	.698	84.5	1.12	.801	80.5	1.17
	-0.98	0.1	293.0	1.39	.298	275.0	1.74	.400	265.0	1.95	.498	257.0	2.11	.590	249.0	2.29	.705	234.0	2.65	.809	215.0	3.15
		0.25	239.0	1.00	.307	237.0	1.03	.401	232.0	1.08	.493	227.0	1.13	.595	220.0	1.21	.714	206.0	1.37	.808	193.0	1.55
		0.5	165.0	1.00	.300	165.0	1.00	.400	165.0	1.00	.500	165.0	1.00	.600	165.0	1.00	.691	165.0	1.00	.602	162.0	1.04
		1.0	96.0	1.00	.300	96.0	1.00	.400	96.0	1.00	.500	96.0	1.00	.600	96.0	1.00	.700	96.0	1.00	.800	96.0	1.00

ANALYTICAL RESULTS - COLUMN 12

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL	P_s/P	P_{AN}	DEL
10.	1.0	0.1	413.0	1.31	.300	413.0	1.31	.400	413.0	1.31	.501	413.0	1.31	.598	410.0	1.34	.700	460.0	1.48	.803	385.0	1.68
		0.25	301.0	1.19	.300	301.0	1.19	.400	301.0	1.19	.500	301.0	1.19	.606	301.0	1.19	.694	301.0	1.19	.806	294.0	1.24
		0.5	204.0	1.12	.300	204.0	1.12	.400	204.0	1.12	.500	204.0	1.12	.598	204.0	1.12	.711	201.0	1.14	.804	194.0	1.19
		1.0	98.0	1.07	.303	97.5	1.07	.402	97.0	1.07	.503	96.5	1.08	.599	96.0	1.08	.702	95.5	1.09	.794	94.5	1.10
	0.0	0.1	443.0	1.00	.300	443.0	1.00	.400	443.0	1.00	.500	443.0	1.00	.600	443.0	1.00	.691	443.0	1.00	.805	426.0	1.14
		0.25	327.0	1.00	.300	327.0	1.00	.400	327.0	1.00	.500	327.0	1.00	.600	327.0	1.00	.700	327.0	1.00	.800	327.0	1.00
		0.5	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	.500	220.0	1.00	.600	220.0	1.00	.700	220.0	1.00	.800	220.0	1.00
		1.0	106.0	1.00	.300	106.0	1.00	.400	106.0	1.00	.500	106.0	1.00	.600	106.0	1.00	.700	106.0	1.00	.800	106.0	1.00
	-0.98	0.1	443.0	1.00	.300	443.0	1.00	.400	443.0	1.00	.500	[redacted]	1.00	.600	443.0	1.00	.700	443.0	1.00	.800	443.0	1.00
		0.25	327.0	1.00	.300	327.0	1.00	.400	327.0	1.00	[redacted]	[redacted]	1.00	.600	327.0	1.00	.700	327.0	1.00	.800	327.0	1.00
		0.5	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	[redacted]	[redacted]	1.00	.600	220.0	1.00	.700	220.0	1.00	.800	220.0	1.00
		1.0	106.0	1.00	.300	106.0	1.00	.400	106.0	1.00	[redacted]	106.0	1.00	.600	106.0	1.00	.700	106.0	1.00	.800	106.0	1.00
20.	1.0	0.1	345.0	2.23	.312	333.0	2.41	.399	326.0	2.52	.498	317.0	2.68	.603	305.0	2.89	.708	291.0	3.16	.807	274.0	3.51
		0.25	243.0	1.72	.297	239.0	1.76	.391	235.0	1.81	.489	231.0	1.86	.604	225.0	1.94	.702	218.0	2.04	.816	206.0	2.22
		0.5	165.0	1.39	.311	161.0	1.42	.411	158.0	1.44	.526	154.0	1.48	.599	152.0	1.49	.701	147.0	1.54	.813	139.0	1.61
		1.0	84.5	1.20	.305	83.5	1.20	.409	82.0	1.22	.506	81.0	1.23	.596	80.5	1.24	.703	79.0	1.26	.800	77.5	1.28
	0.0	0.1	392.0	1.59	.306	386.0	1.66	.401	377.0	1.78	.492	368.0	1.90	.607	351.0	2.14	.711	332.0	2.42	.801	312.0	2.76
		0.25	307.0	1.14	.305	302.0	1.18	.399	296.0	1.22	.486	290.0	1.27	.598	281.0	1.34	.706	269.0	1.45	.805	256.0	1.58
		0.5	218.0	1.02	.300	218.0	1.02	.400	218.0	1.02	.491	218.0	1.02	.606	213.0	1.05	.707	205.0	1.12	.796	196.0	1.18
		1.0	106.0	1.00	.300	106.0	1.00	.400	106.0	1.00	.500	106.0	1.00	.600	106.0	1.00	.700	106.0	1.00	.800	106.0	1.00
	-0.98	0.1	443.0	1.00	.300	443.0	1.00	.400	443.0	1.00	.501	443.0	1.00	.595	439.0	.99	.711	422.0	1.19	.798	401.0	1.46
		0.25	327.0	1.00	.300	327.0	1.00	.400	327.0	1.00	.500	327.0	1.00	.600	327.0	1.00	.700	327.0	1.00	.800	327.0	1.00
		0.5	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	.500	220.0	1.00	.600	220.0	1.00	.700	220.0	1.00	.800	220.0	1.00
		1.0	106.0	1.00	.300	106.0	1.00	.400	106.0	1.00	.500	106.0	1.00	.600	106.0	1.00	.700	106.0	1.00	.800	106.0	1.00
30.	1.0	0.1	267.0	3.68	.331	239.0	4.41	.445	227.0	4.78	.558	217.0	5.14	.601	213.0	5.27	.681	207.0	5.50	.794	194.0	5.95
		0.25	181.0	2.55	.306	170.0	2.70	.404	166.0	2.76	.506	162.0	2.82	.601	158.0	2.89	.711	152.0	2.98	.813	144.0	3.13
		0.5	125.0	1.76	.314	118.0	1.84	.414	116.0	1.86	.513	113.0	1.90	.595	111.0	1.93	.710	107.0	1.99	.814	102.0	2.07
		1.0	70.0	1.38	.307	68.5	1.41	.415	67.5	1.42	.519	66.5	1.44	.603	65.5	1.45	.698	64.5	1.46	.802	63.0	1.50
	0.0	0.1	313.0	2.74	.325	289.0	3.19	.414	278.0	3.42	.498	267.0	3.68	.602	254.0	4.00	.705	241.0	4.36	.796	226.0	4.82
		0.25	239.0	1.76	.301	219.0	2.03	.410	210.0	2.16	.488	205.0	2.23	.599	197.0	2.34	.700	190.0	2.43	.796	181.0	2.55
		0.5	174.0	1.32	.315	165.0	1.39	.407	162.0	1.41	.500	158.0	1.44	.597	154.0	1.48	.698	149.0	1.52	.801	141.0	1.59
		1.0	102.5	1.03	.308	100.5	1.04	.392	99.5	1.05	.480	98.0	1.07	.594	96.0	1.08	.697	94.0	1.10	.793	92.0	1.12
	-0.98	0.1	390.0	1.62	.293	372.0	1.84	.402	361.0	2.00	.497	352.0	2.13	.592	343.0	2.26	.722	324.0	2.56	.795	308.0	2.83
		0.25	324.0	1.02	.303	320.0	1.05	.403	313.0	1.10	.490	308.0	1.13	.603	297.0	1.22	.707	283.0	1.33	.796	269.0	1.45
		0.5	220.0	1.00	.300	220.0	1.00	.400	220.0	1.00	.500	220.0	1.00	.600	220.0	1.00	.691	220.0	1.00	.802	217.0	1.03
		1.0	106.0	1.00	.300	106.0	1.00	.400	106.0	1.00	.500	106.0	1.00	.600	106.0	1.00	.700	106.0	1.00	.800	106.0	1.00

ANALYTICAL RESULTS - COLUMN 13

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	219.0	1.32	.300	219.0	1.32	.400	219.0	1.32	.509	216.0	1.38	.614	207.0	1.56	.697	198.0	1.74	.784	185.0	2.00
		0.25	143.0	1.21	.300	143.0	1.21	.400	143.0	1.21	.514	140.0	1.25	.632	136.0	1.30	.735	132.0	1.35	.780	127.0	1.42
		0.5	80.5	1.15	.300	80.5	1.15	.403	79.5	1.16	.529	76.5	1.19	.655	74.0	1.21	.722	72.0	1.24	.797	69.0	1.27
		1.0	30.8	1.08	.306	30.3	1.10	.408	30.0	1.10	.521	29.8	1.11	.632	29.3	1.12	.748	28.6	1.13	.800	28.8	1.13
	0.0	0.1	237.0	1.00	.300	237.0	1.00	.400	237.0	1.00	.500	237.0	1.00	.599	237.0	1.00	.688	231.0	1.10	.809	209.0	1.52
		0.25	163.0	1.00	.300	163.0	1.00	.400	163.0	1.00	.500	163.0	1.00	.600	163.0	1.00	.700	163.0	1.00	.800	155.0	1.08
		0.5	95.5	1.00	.300	96.5	1.00	.400	96.5	1.00	.500	96.5	1.00	.600	96.5	1.00	.700	96.5	1.00	.823	93.5	1.06
		1.0	34.3	1.00	.300	34.3	1.00	.400	34.3	1.00	.500	34.3	1.00	.600	34.3	1.00	.700	34.3	1.00	.800	34.3	1.00
	-0.98	0.1	237.0	1.00	.300	237.0	1.00	.400	237.0	1.00	.500	237.0	1.00	.600	237.0	1.00	.700	237.0	1.00	.800	237.0	1.00
		0.25	163.0	1.00	.300	163.0	1.00	.400	163.0	1.00	.500	163.0	1.00	.600	163.0	1.00	.700	163.0	1.00	.800	163.0	1.00
		0.5	96.5	1.00	.300	96.5	1.00	.400	96.5	1.00	.500	96.5	1.00	.600	96.5	1.00	.700	96.5	1.00	.800	96.5	1.00
		1.0	34.3	1.00	.300	34.3	1.00	.400	34.3	1.00	.500	34.3	1.00	.600	34.3	1.00	.700	34.3	1.00	.800	34.3	1.00
20.	1.0	0.1	166.0	2.43	.316	158.0	2.62	.452	146.0	2.95	.452	146.0	2.95	.643	129.0	3.49	.643	129.0	3.49	.789	114.0	4.09
		0.25	95.0	2.03	.315	96.5	2.12	.437	87.0	2.17	.524	84.0	2.22	.585	82.0	2.27	.679	73.0	2.35	.793	72.5	2.46
		0.5	53.0	1.50	.320	50.0	1.55	.433	48.5	1.58	.564	47.0	1.63	.594	47.0	1.63	.727	44.0	1.70	.791	43.0	1.72
		1.0	25.3	1.26	.313	24.0	1.30	.421	23.8	1.31	.554	23.0	1.35	.534	23.0	1.35	.678	22.5	1.37	.795	22.0	1.39
	0.0	0.1	200.0	1.70	.303	198.0	1.74	.410	188.0	1.94	.508	179.0	2.13	.595	168.0	2.38	.695	154.0	2.73	.787	141.0	3.09
		0.25	141.0	1.24	.316	133.0	1.34	.421	126.0	1.44	.492	122.0	1.50	.614	114.0	1.64	.710	107.0	1.77	.792	101.0	1.90
		0.5	87.0	1.09	.311	83.5	1.12	.407	81.0	1.15	.497	78.5	1.17	.600	75.0	1.21	.704	71.0	1.25	.805	66.5	1.31
		1.0	34.3	1.00	.300	34.3	1.00	.400	34.3	1.00	.496	34.3	1.00	.603	34.0	1.01	.716	33.5	1.02	.803	33.0	1.02
	-0.98	0.1	237.0	1.00	.300	237.0	1.00	.400	237.0	1.00	.502	237.0	1.00	.603	232.0	1.08	.689	219.0	1.32	.807	197.0	1.76
		0.25	163.0	1.00	.300	163.0	1.00	.400	163.0	1.00	.500	163.0	1.00	.600	163.0	1.00	.699	163.0	1.00	.799	154.0	1.09
		0.5	96.5	1.00	.300	96.5	1.00	.400	96.5	1.00	.500	96.5	1.00	.600	96.5	1.00	.700	96.5	1.00	.800	95.5	1.00
		1.0	34.3	1.00	.300	34.3	1.00	.400	34.3	1.00	.500	34.3	1.00	.600	34.3	1.00	.700	34.3	1.00	.800	34.3	1.00
30.	1.0	0.1	107.0	4.42	.372	86.0	5.45	.372	86.0	5.45	.487	78.0	5.88	.606	71.0	6.24	.750	64.0	6.69	.805	61.5	6.83
		0.25	55.0	2.95	.330	50.0	3.10	.463	47.5	3.23	.463	47.5	3.23	.611	45.0	3.35	.682	44.0	3.40	.795	41.5	3.55
		0.5	35.0	1.98	.328	32.0	2.11	.452	31.0	2.15	.452	31.0	2.15	.593	29.5	2.22	.753	28.0	2.32	.800	27.5	2.35
		1.0	19.8	1.51	.324	18.5	1.58	.444	18.0	1.62	.444	18.0	1.62	.571	17.5	1.66	.691	17.0	1.69	.813	16.5	1.74
	0.0	0.1	136.0	3.25	.323	127.0	3.56	.424	118.0	3.92	.509	110.0	4.27	.614	101.0	4.75	.717	92.0	5.22	.791	86.0	5.45
		0.25	88.0	2.15	.284	74.0	2.42	.379	70.0	2.52	.508	65.0	2.65	.592	62.5	2.70	.703	59.0	2.81	.802	55.5	2.93
		0.5	53.5	1.50	.296	49.0	1.59	.426	47.0	1.63	.500	46.0	1.64	.632	44.0	1.70	.694	42.5	1.73	.790	40.5	1.80
		1.0	30.5	1.09	.325	28.5	1.14	.402	28.0	1.16	.495	27.3	1.18	.589	26.8	1.20	.709	25.8	1.23	.800	25.0	1.26
	-0.98	0.1	175.0	2.22	.300	175.0	2.22	.400	175.0	2.22	.500	175.0	2.22	.600	175.0	2.22	.728	158.0	2.62	.814	145.0	2.97
		0.25	152.0	1.11	.300	151.5	1.12	.409	145.5	1.18	.502	139.5	1.26	.611	131.0	1.36	.722	120.5	1.52	.800	112.5	1.66
		0.5	96.5	1.00	.301	96.5	1.00	.403	95.5	1.01	.500	93.0	1.03	.592	89.5	1.07	.676	85.5	1.10	.808	78.0	1.18
		1.0	34.3	1.00	.300	34.3	1.00	.400	34.3	1.00	.500	34.3	1.00	.600	34.3	1.00	.700	34.3	1.00	.800	34.3	1.00

ANALYTICAL RESULTS - COLUMN 1+

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	336.0	1.32	.300	336.0	1.32	.400	336.0	1.32	.500	336.0	1.32	.616	328.0	1.42	.776	363.0	1.73	.865	297.0	1.30
		0.25	211.0	1.22	.300	211.0	1.22	.398	211.0	1.22	.505	210.0	1.23	.620	205.0	1.26	.767	193.0	1.36	.913	187.0	1.41
		0.5	97.5	1.15	.304	97.0	1.16	.411	95.0	1.17	.527	93.0	1.18	.650	90.0	1.20	.775	86.5	1.22	.797	86.0	1.23
		1.0	33.3	1.09	.305	32.8	1.11	.411	32.3	1.12	.523	32.0	1.13	.635	31.5	1.14	.726	31.3	1.14	.829	30.8	1.16
	0.0	0.1	365.0	1.00	.300	365.0	1.00	.400	365.0	1.00	.500	365.0	1.00	.600	365.0	1.00	.690	365.0	1.00	.796	348.0	1.10
		0.25	245.0	1.00	.300	245.0	1.00	.400	245.0	1.00	.500	245.0	1.00	.600	245.0	1.00	.700	245.0	1.00	.800	245.0	1.00
		0.5	124.5	1.00	.300	124.5	1.00	.400	124.5	1.00	.500	124.5	1.00	.600	124.5	1.00	.700	124.5	1.00	.800	124.5	1.00
		1.0	37.8	1.00	.300	37.8	1.00	.400	37.8	1.00	.500	37.8	1.00	.600	37.8	1.00	.700	37.8	1.00	.800	37.8	1.00
	-0.98	0.1	365.0	1.00	.300	365.0	1.00	.400	365.0	1.00	.500	365.0	1.00	.600	365.0	1.00	.700	365.0	1.00	.800	365.0	1.00
		0.25	245.0	1.00	.300	245.0	1.00	.400	245.0	1.00	.500	245.0	1.00	.600	245.0	1.00	.700	245.0	1.00	.800	245.0	1.00
		0.5	124.5	1.00	.300	124.5	1.00	.400	124.5	1.00	.500	124.5	1.00	.600	124.5	1.00	.700	124.5	1.00	.800	124.5	1.00
		1.0	37.8	1.00	.300	37.8	1.00	.400	37.8	1.00	.500	37.8	1.00	.600	37.8	1.00	.700	37.8	1.00	.800	37.8	1.00
20.	1.0	0.1	254.0	2.37	.305	249.0	2.45	.436	234.0	2.67	.436	234.0	2.67	.593	214.0	3.00	.722	194.0	3.38	.845	174.0	3.83
		0.25	131.0	1.94	.317	123.0	2.02	.437	119.0	2.05	.584	113.0	2.12	.584	113.0	2.12	.667	108.0	2.17	.818	99.0	2.28
		0.5	63.0	1.47	.325	58.5	1.54	.442	56.5	1.57	.578	54.5	1.63	.636	53.5	1.62	.731	52.0	1.66	.862	50.5	1.58
		1.0	27.5	1.25	.317	26.0	1.30	.427	25.8	1.32	.545	25.3	1.34	.667	24.8	1.36	.724	24.5	1.36	.792	24.0	1.38
	0.0	0.1	305.0	1.71	.302	305.0	1.71	.395	301.0	1.76	.510	286.0	1.95	.623	265.0	2.22	.724	243.0	2.53	.869	225.0	2.81
		0.25	210.0	1.23	.299	204.0	1.27	.410	195.0	1.34	.503	187.0	1.41	.605	177.0	1.51	.709	165.0	1.63	.794	155.0	1.73
		0.5	113.0	1.06	.310	108.0	1.09	.403	105.5	1.11	.502	101.5	1.13	.600	97.5	1.15	.704	93.0	1.18	.797	88.5	1.21
		1.0	37.8	1.00	.300	37.8	1.00	.400	37.8	1.00	.497	37.8	1.00	.604	37.3	1.01	.721	36.8	1.03	.795	36.5	1.03
	-0.98	0.1	364.0	.99	.300	364.0	.99	.400	364.0	.99	.500	364.0	.99	.591	364.0	.99	.725	346.0	1.20	.791	330.0	1.40
		0.25	245.0	1.00	.300	245.0	1.00	.400	245.0	1.00	.500	245.0	1.00	.600	245.0	1.00	.700	245.0	1.00	.800	245.0	1.00
		0.5	124.5	1.00	.300	124.5	1.00	.400	124.5	1.00	.500	124.5	1.00	.600	124.5	1.00	.700	124.5	1.00	.800	124.5	1.00
		1.0	37.8	1.00	.300	37.8	1.00	.400	37.8	1.00	.500	37.8	1.00	.600	37.8	1.00	.700	37.8	1.00	.800	37.8	1.00
30.	1.0	0.1	165.0	4.07	.350	143.0	4.59	.350	143.0	4.59	.524	126.0	4.95	.615	117.0	5.20	.729	107.0	5.47	.810	100.0	5.67
		0.25	72.0	2.72	.347	62.0	2.95	.347	62.0	2.95	.492	59.0	3.06	.637	56.5	3.14	.716	54.5	3.21	.800	52.5	3.29
		0.5	41.0	1.90	.338	37.0	2.04	.465	35.5	2.10	.465	35.5	2.10	.594	34.5	2.15	.742	33.0	2.22	.813	32.0	2.25
		1.0	21.8	1.49	.321	20.3	1.57	.443	19.8	1.61	.443	19.8	1.61	.571	19.3	1.64	.693	18.8	1.68	.797	18.5	1.69
	0.0	0.1	211.0	3.05	.307	205.0	3.16	.422	192.0	3.42	.508	181.0	3.66	.613	168.0	3.99	.716	155.0	4.33	.866	144.0	4.56
		0.25	133.0	1.92	.301	113.0	2.12	.401	106.0	2.20	.505	99.0	2.28	.609	92.0	2.39	.695	87.0	2.44	.795	81.0	2.54
		0.5	68.0	1.41	.317	60.0	1.52	.410	58.5	1.54	.500	57.0	1.56	.600	55.0	1.59	.699	53.0	1.64	.802	50.5	1.68
		1.0	34.3	1.07	.315	31.8	1.14	.400	31.3	1.14	.500	30.5	1.17	.592	30.0	1.18	.692	29.3	1.20	.807	28.5	1.22
	-0.98	0.1	271.0	2.14	.300	271.0	2.14	.400	271.0	2.14	.500	271.0	2.14	.590	271.0	2.14	.730	256.0	2.34	.811	238.0	2.61
		0.25	230.5	1.09	.299	230.5	1.09	.396	227.5	1.11	.506	217.5	1.18	.600	207.5	1.25	.712	192.5	1.37	.797	179.5	1.48
		0.5	124.5	1.00	.300	124.5	1.00	.402	124.5	1.00	.508	123.0	1.01	.601	119.0	1.03	.689	114.0	1.05	.800	107.5	1.09
		1.0	37.8	1.00	.300	37.8	1.00	.400	37.8	1.00	.500	37.8	1.00	.600	37.8	1.00	.700	37.8	1.00	.800	37.8	1.00

ANALYTICAL RESULTS - COLUMN 15

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	226.0	1.32	.300	226.0	1.32	.400	226.0	1.32	.500	226.0	1.32	.627	217.0	1.51	.729	203.0	1.81	.816	190.0	2.11
		0.25	157.0	1.19	.300	157.0	1.19	.400	157.0	1.19	.503	157.0	1.19	.606	155.0	1.22	.689	151.0	1.27	.809	136.0	1.49
		0.5	96.5	1.13	.300	96.5	1.13	.401	96.0	1.13	.519	93.5	1.16	.641	99.5	1.19	.786	84.0	1.26	.828	81.5	1.29
		1.0	37.8	1.10	.300	37.8	1.10	.400	37.8	1.10	.500	37.8	1.10	.623	37.8	1.10	.711	37.3	1.11	.804	37.0	1.12
	0.0	0.1	242.0	1.00	.300	242.0	1.00	.400	242.0	1.00	.500	242.0	1.00	.599	242.0	1.00	.720	232.0	1.19	.795	219.0	1.46
		0.25	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.600	174.0	1.00	.700	174.0	1.00	.794	170.0	1.04
		0.5	109.5	1.00	.300	109.5	1.00	.400	109.5	1.00	.500	109.5	1.00	.600	109.5	1.00	.699	109.5	1.00	.802	106.0	1.04
		1.0	43.0	1.00	.300	43.0	1.00	.400	43.0	1.00	.500	43.0	1.00	.600	43.0	1.00	.700	43.0	1.00	.600	43.0	1.00
	-0.98	0.1	242.0	1.00	.300	242.0	1.00	.400	242.0	1.00	.500	242.0	1.00	.600	242.0	1.00	.700	242.0	1.00	.800	242.0	1.00
		0.25	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.600	174.0	1.00	.700	174.0	1.00	.800	174.0	1.00
		0.5	109.5	1.00	.300	109.5	1.00	.400	109.5	1.00	.500	109.5	1.00	.600	109.5	1.00	.700	109.5	1.00	.800	109.5	1.00
		1.0	43.0	1.00	.300	43.0	1.00	.400	43.0	1.00	.500	43.0	1.00	.600	43.0	1.00	.700	43.0	1.00	.800	43.0	1.00
20.	1.0	0.1	183.0	2.27	.318	173.0	2.53	.448	163.0	2.[illegible]0	.529	157.0	2.99	.622	148.0	3.28	.754	134.0	3.80	.813	128.0	4.05
		0.25	117.0	1.84	.317	110.5	1.98	.441	106.5	2.07	.571	102.5	2.14	.571	102.5	2.14	.769	91.0	2.36	.798	89.0	2.41
		0.5	68.5	1.46	.313	65.5	1.51	.433	63.5	1.54	.566	61.0	1.59	.566	61.0	1.59	.707	58.0	1.65	.786	56.0	1.68
		1.0	31.3	1.26	.306	31.0	1.26	.407	30.8	1.27	.516	30.5	1.27	.625	30.0	1.29	.689	29.8	1.30	.810	29.0	1.32
	0.0	0.1	211.0	1.64	.303	208.0	1.70	.410	200.0	1.88	.497	193.0	2.04	.627	177.0	2.43	.724	163.0	2.80	.803	152.0	3.14
		0.25	159.0	1.17	.303	152.0	1.26	.411	146.0	1.34	.496	141.0	1.41	.654	134.0	1.52	.706	126.0	1.66	.797	118.0	1.81
		0.5	105.0	1.05	.302	102.5	1.07	.407	99.5	1.10	.492	97.5	1.12	.638	93.0	1.16	.701	88.5	1.21	.811	82.0	1.28
		1.0	43.0	1.00	.300	43.0	1.00	.400	43.0	1.00	.500	43.0	1.00	.600	43.0	1.00	.692	43.0	1.00	.795	42.8	1.00
	-0.98	0.1	242.0	1.00	.300	242.0	1.00	.400	242.0	1.00	.500	242.0	1.00	.601	238.0	1.07	.690	226.0	1.32	.813	203.0	1.81
		0.25	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.600	174.0	1.00	.701	174.0	1.00	.812	165.0	1.10
		0.5	109.5	1.00	.300	109.5	1.00	.400	109.5	1.00	.500	109.5	1.00	.600	109.5	1.00	.700	109.5	1.00	.811	106.0	1.04
		1.0	43.0	1.00	.300	43.0	1.00	.400	43.0	1.00	.500	43.0	1.00	.600	43.0	1.00	.700	43.0	1.00	.800	43.0	1.00
30.	1.0	0.1	122.0	4.34	.333	111.0	4.93	.333	111.0	4.93	.485	101.0	5.44	.579	95.0	5.72	.693	88.0	6.07	.795	83.0	6.34
		0.25	73.5	2.78	.324	68.0	2.95	.454	65.0	3.04	.454	65.0	3.04	.597	62.0	3.14	.597	62.0	3.14	.829	55.5	3.39
		0.5	46.0	1.91	.322	43.5	2.00	.435	42.5	2.03	.561	41.0	2.09	.561	41.0	2.09	.696	39.5	2.12	.813	37.5	2.21
		1.0	25.0	1.46	.309	24.3	1.50	.421	23.8	1.52	.532	23.5	1.52	.652	23.0	1.56	.769	22.8	1.57	.811	22.5	1.58
	0.0	0.1	150.0	3.21	.291	148.0	3.28	.416	137.0	3.69	.504	129.0	4.01	.613	119.0	4.50	.696	112.0	4.86	.814	102.0	5.38
		0.25	106.0	2.08	.266	99.5	2.20	.405	92.5	2.34	.503	87.5	2.44	.583	84.0	2.51	.686	79.5	2.63	.776	76.0	2.70
		0.5	71.0	1.43	.301	66.5	1.49	.411	64.5	1.53	.496	62.5	1.56	.630	60.0	1.60	.690	58.0	1.65	.807	54.5	1.70
		1.0	38.5	1.09	.285	37.8	1.10	.396	37.3	1.11	.490	36.8	1.11	.601	35.8	1.14	.693	35.0	1.15	.794	34.0	1.19
	-0.98	0.1	187.0	2.18	.300	187.0	2.18	.400	187.0	2.18	.492	187.0	2.18	.595	185.0	2.22	.692	172.0	2.56	.806	155.0	3.05
		0.25	169.0	1.06	.302	167.0	1.08	.404	162.0	1.14	.498	156.5	1.20	.601	149.0	1.30	.711	138.5	1.45	.798	123.5	1.61
		0.5	109.5	1.00	.300	109.5	1.00	.400	109.5	1.00	.502	109.5	1.00	.609	107.5	1.02	.694	103.0	1.07	.801	95.5	1.14
		1.0	43.0	1.00	.300	43.0	1.00	.400	43.0	1.00	.500	43.0	1.00	.600	43.0	1.00	.700	43.0	1.00	.800	43.0	1.00

ANALYTICAL RESULTS - COLUMN 16

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPRCX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	343.0	1.33	.300	343.0	1.33	.400	343.0	1.33	.501	343.0	1.33	.604	341.0	1.36	.750	320.0	1.63	.807	311.0	1.75
		0.25	230.0	1.20	.300	230.0	1.20	.400	230.0	1.20	.500	230.0	1.20	.603	229.0	1.21	.757	215.0	1.32	.801	211.0	1.35
		0.5	119.5	1.14	.302	117.5	1.14	.411	115.5	1.16	.527	113.0	1.17	.645	110.0	1.19	.645	110.0	1.19	.783	105.0	1.22
		1.0	39.5	1.10	.300	39.5	1.10	.400	39.5	1.10	.500	39.5	1.10	.605	39.3	1.09	.776	39.0	1.10	.795	39.0	1.10
	0.0	0.1	370.0	1.00	.300	370.0	1.00	.400	370.0	1.00	.500	370.0	1.00	.600	370.0	1.00	.699	370.0	1.00	.798	357.0	1.15
		0.25	258.0	1.00	.300	258.0	1.00	.400	258.0	1.00	.500	258.0	1.00	.600	258.0	1.00	.700	258.0	1.00	.800	258.0	1.00
		0.5	142.5	1.00	.300	142.5	1.00	.400	142.5	1.00	.500	142.5	1.00	.600	142.5	1.00	.700	142.5	1.00	.800	142.5	1.00
		1.0	45.3	1.00	.300	45.3	1.00	.400	45.3	1.00	.500	45.3	1.00	.600	45.3	1.00	.700	45.3	1.00	.800	45.3	1.00
	-0.98	0.1	370.0	1.00	.300	370.0	1.00	.400	370.0	1.00	.500	370.0	1.00	.600	370.0	1.00	.700	370.0	1.00	.800	370.0	1.00
		0.25	258.0	1.00	.300	258.0	1.00	.400	258.0	1.00	.500	258.0	1.00	.600	258.0	1.00	.700	258.0	1.00	.800	258.0	1.00
		0.5	142.5	1.00	.300	142.5	1.00	.400	142.5	1.00	.500	142.5	1.00	.600	142.5	1.00	.700	142.5	1.00	.800	142.5	1.00
		1.0	45.3	1.00	.300	45.3	1.00	.400	45.3	1.00	.500	45.3	1.00	.600	45.3	1.00	.700	45.3	1.00	.800	45.3	1.00
20.	1.0	0.1	272.0	2.30	.311	264.0	2.42	.434	251.0	2.63	.434	251.0	2.63	.581	234.0	2.92	.665	221.0	3.17	.762	202.0	3.58
		0.25	159.0	1.85	.319	151.0	1.92	.441	145.0	1.98	.441	145.0	1.98	.576	139.0	2.03	.762	126.0	2.18	.819	121.0	2.24
		0.5	79.5	1.45	.311	75.5	1.48	.426	74.0	1.51	.549	72.0	1.53	.549	72.0	1.53	.681	69.0	1.58	.811	66.0	1.61
		1.0	33.0	1.23	.308	32.5	1.25	.414	32.0	1.26	.520	31.8	1.27	.627	31.5	1.28	.742	31.0	1.29	.782	31.0	1.29
	0.0	0.1	317.0	1.67	.300	317.0	1.67	.397	312.0	1.74	.500	300.0	1.90	.620	279.0	2.19	.696	263.0	2.43	.808	239.0	2.33
		0.25	232.0	1.18	.311	225.0	1.24	.404	218.0	1.29	.500	210.0	1.36	.605	200.0	1.45	.707	188.0	1.57	.797	177.0	1.69
		0.5	136.0	1.04	.311	132.0	1.06	.401	128.5	1.08	.496	125.0	1.10	.595	121.0	1.12	.709	115.0	1.16	.807	109.0	1.20
		1.0	45.3	1.00	.300	45.3	1.00	.400	45.3	1.00	.500	45.3	1.00	.600	45.3	1.00	.700	45.3	1.00	.800	45.3	1.00
	-0.95	0.1	370.0	1.00	.300	370.0	1.00	.400	370.0	1.00	.500	370.0	1.00	.589	370.0	1.00	.718	355.0	1.18	.798	336.0	1.43
		0.25	258.0	1.00	.300	258.0	1.00	.400	258.0	1.00	.500	258.0	1.00	.600	258.0	1.00	.700	258.0	1.00	.800	258.0	1.00
		0.5	142.5	1.00	.300	142.5	1.00	.400	142.5	1.00	.500	142.5	1.00	.600	142.5	1.00	.700	142.5	1.00	.800	142.5	1.00
		1.0	45.3	1.00	.300	45.3	1.00	.400	45.3	1.00	.500	45.3	1.00	.600	45.3	1.00	.700	45.3	1.00	.800	45.3	1.00
30.	1.0	0.1	180.0	4.14	.327	165.0	4.49	.474	152.0	4.78	.474	152.0	4.78	.667	135.0	5.21	.736	129.0	5.38	.820	122.0	5.57
		0.25	91.5	2.64	.327	84.0	2.80	.451	81.0	2.87	.451	81.0	2.87	.654	76.5	2.96	.748	73.5	3.01	.811	71.5	3.07
		0.5	52.0	1.86	.320	48.5	1.93	.447	47.0	1.96	.447	47.0	1.96	.565	46.0	1.99	.697	44.5	2.02	.793	43.5	2.06
		1.0	26.5	1.44	.314	25.5	1.48	.416	25.3	1.49	.535	24.8	1.51	.653	24.5	1.52	.771	24.0	1.53	.792	24.0	1.55
	0.0	0.1	224.0	3.11	.300	223.0	3.13	.414	210.0	3.40	.508	199.0	3.65	.608	186.0	3.98	.711	173.0	4.31	.813	160.0	4.60
		0.25	151.0	1.92	.297	138.0	2.05	.414	130.5	2.13	.500	125.0	2.20	.603	118.5	2.28	.705	112.0	2.36	.810	105.0	2.45
		0.5	87.5	1.37	.298	80.5	1.44	.399	79.0	1.46	.497	76.5	1.48	.591	74.5	1.50	.706	71.5	1.53	.803	68.5	1.59
		1.0	41.5	1.06	.311	40.3	1.08	.396	39.8	1.09	.490	39.3	1.09	.594	38.8	1.11	.693	38.3	1.12	.800	37.5	1.13
	-0.98	0.1	283.0	2.13	.300	283.0	2.13	.400	283.0	2.13	.500	283.0	2.13	.601	283.0	2.13	.684	275.0	2.25	.810	247.0	2.69
		0.25	250.0	1.06	.300	250.0	1.06	.398	245.0	1.09	.499	237.5	1.14	.600	227.5	1.22	.698	215.0	1.32	.810	197.5	1.47
		0.5	142.5	1.00	.300	142.5	1.00	.400	142.5	1.00	.502	142.5	1.00	.602	142.0	1.01	.729	134.5	1.04	.807	129.5	1.37
		1.0	45.3	1.00	.300	45.3	1.00	.400	45.3	1.00	.500	45.3	1.00	.600	45.3	1.00	.700	45.3	1.00	.800	45.3	1.00

ANALYTICAL RESULTS - COLUMN 17

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	282.0	1.29	.300	282.0	1.29	.401	282.0	1.29	.500	278.0	1.35	.598	271.0	1.46	.703	259.0	1.68	.794	243.0	1.97
		0.25	195.0	1.19	.300	195.0	1.19	.400	195.0	1.19	.497	193.0	1.21	.595	190.0	1.25	.703	185.0	1.30	.783	175.0	1.42
		0.5	125.0	1.15	.300	125.0	1.15	.400	125.0	1.15	.500	125.0	1.15	.600	125.0	1.15	.696	125.0	1.15	.798	119.0	1.23
		1.0	66.5	1.09	.300	66.5	1.09	.400	66.5	1.09	.489	66.5	1.09	.591	66.0	1.10	.708	65.0	1.11	.794	63.0	1.13
	0.0	0.1	305.0	1.00	.300	305.0	1.00	.400	305.0	1.00	.500	305.0	1.00	.600	305.0	1.00	.717	293.0	1.11	.807	274.0	1.42
		0.25	215.0	1.00	.300	215.0	1.00	.400	215.0	1.00	.500	215.0	1.00	.600	215.0	1.00	.700	215.0	1.00	.815	205.0	1.10
		0.5	138.0	1.00	.300	138.0	1.00	.400	138.0	1.00	.500	138.0	1.00	.600	138.0	1.00	.700	138.0	1.00	.800	138.0	1.00
		1.0	73.5	1.00	.300	73.5	1.00	.400	73.5	1.00	.500	73.5	1.00	.600	73.5	1.00	.700	73.5	1.00	.800	73.5	1.00
	-0.98	0.1	305.0	1.00	.300	305.0	1.00	.400	305.0	1.00	.500	305.0	1.00	.600	305.0	1.00	.700	305.0	1.00	.800	305.0	1.00
		0.25	215.0	1.00	.300	215.0	1.00	.400	215.0	1.00	.500	215.0	1.00	.600	215.0	1.00	.700	215.0	1.00	.800	215.0	1.00
		0.5	138.0	1.00	.300	138.0	1.00	.400	138.0	1.00	.500	138.0	1.00	.600	138.0	1.00	.700	138.0	1.00	.800	138.0	1.00
		1.0	73.5	1.00	.300	73.5	1.00	.400	73.5	1.00	.500	73.5	1.00	.600	73.5	1.00	.700	73.5	1.00	.800	73.5	1.00
20.	1.0	0.1	220.0	2.41	.300	213.0	2.56	.397	204.0	2.76	.492	195.0	2.98	.586	186.0	3.23	.693	176.0	3.52	.793	164.0	3.92
		0.25	145.0	1.87	.300	140.0	1.97	.394	137.0	2.02	.496	133.0	2.11	.597	129.0	2.20	.696	125.0	2.29	.805	118.0	2.48
		0.5	97.0	1.59	.299	97.0	1.59	.389	95.0	1.62	.484	93.0	1.66	.589	90.0	1.71	.690	87.0	1.76	.783	83.0	1.92
		1.0	53.5	1.29	.290	53.5	1.29	.387	53.0	1.30	.490	52.0	1.32	.592	51.5	1.33	.710	50.0	1.36	.804	48.5	1.39
	0.0	0.1	260.0	1.65	.304	257.0	1.72	.405	247.0	1.89	.506	235.0	2.11	.605	223.0	2.35	.723	206.0	2.72	.798	193.0	3.04
		0.25	193.0	1.21	.314	185.0	1.30	.408	179.0	1.37	.497	173.0	1.45	.599	167.0	1.52	.709	158.0	1.65	.811	148.0	1.82
		0.5	131.0	1.07	.298	131.0	1.07	.395	129.0	1.10	.488	127.0	1.12	.597	124.0	1.16	.700	120.0	1.21	.796	113.0	1.31
		1.0	73.5	1.00	.300	73.5	1.00	.400	73.5	1.00	.500	73.5	1.00	.599	73.5	1.00	.715	72.0	1.03	.806	69.5	1.05
	-0.98	0.1	305.0	1.00	.300	305.0	1.00	.400	305.0	1.00	.502	305.0	1.00	.608	296.0	1.07	.726	277.0	1.36	.799	259.0	1.60
		0.25	215.0	1.00	.300	215.0	1.00	.400	215.0	1.00	.500	215.0	1.00	.600	215.0	1.00	.700	215.0	1.00	.799	209.0	1.06
		0.5	138.0	1.00	.300	138.0	1.00	.400	138.0	1.00	.500	138.0	1.00	.600	138.0	1.00	.700	138.0	1.00	.800	138.0	1.00
		1.0	73.5	1.00	.300	73.5	1.00	.400	73.5	1.00	.500	73.5	1.00	.600	73.5	1.00	.700	73.5	1.00	.800	73.5	1.00
30.	1.0	0.1	136.0	5.11	.302	126.0	5.67	.385	122.0	5.93	.475	118.0	6.19	.607	112.0	6.63	.701	107.0	7.02	.804	102.0	7.47
		0.25	93.0	3.32	.297	91.0	3.38	.382	89.0	3.46	.483	87.0	3.52	.571	84.0	3.60	.691	81.0	3.73	.805	77.0	3.89
		0.5	66.5	2.18	.290	65.5	2.21	.388	64.5	2.23	.484	63.0	2.26	.569	61.5	2.30	.709	56.5	2.40	.813	56.0	2.49
		1.0	41.5	1.58	.296	40.5	1.60	.400	40.0	1.63	.494	39.5	1.65	.584	38.5	1.68	.684	38.0	1.70	.808	36.5	1.75
	0.0	0.1	170.0	3.71	.309	165.0	3.88	.419	155.0	4.25	.503	147.0	4.59	.601	138.0	5.01	.705	129.0	5.50	.793	121.0	5.99
		0.25	121.0	2.40	.316	114.0	2.59	.409	110.0	2.71	.491	108.0	2.78	.612	103.0	2.95	.707	99.0	3.11	.800	95.0	3.25
		0.5	91.5	1.69	.307	89.5	1.72	.400	87.5	1.75	.500	85.0	1.79	.604	82.0	1.84	.703	79.0	1.90	.796	76.0	1.95
		1.0	61.5	1.15	.306	60.5	1.17	.395	59.5	1.19	.489	58.8	1.20	.604	56.8	1.23	.700	55.0	1.26	.802	53.0	1.30
	-0.98	0.1	219.0	2.43	.300	219.0	2.43	.400	219.0	2.43	.500	219.0	2.43	.598	219.0	2.43	.696	217.0	2.47	.812	197.0	2.94
		0.25	200.0	1.14	.300	200.0	1.14	.396	197.0	1.18	.508	189.0	1.26	.602	181.0	1.35	.708	171.0	1.47	.799	159.0	1.54
		0.5	138.0	1.00	.300	138.0	1.00	.400	138.0	1.00	.500	138.0	1.00	.606	137.0	1.01	.697	132.0	1.07	.798	124.0	1.16
		1.0	73.5	1.00	.300	73.5	1.00	.400	73.5	1.00	.500	73.5	1.00	.600	73.5	1.00	.700	73.5	1.00	.800	73.5	1.00

ANALYTICAL RESULTS - COLUMN 18

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	397.0	1.30	.300	397.0	1.30	.400	397.0	1.30	.499	397.0	1.30	.597	390.0	1.37	.699	375.0	1.55	.808	355.0	1.79
		0.25	267.0	1.20	.300	267.0	1.20	.401	267.0	1.20	.500	266.0	1.21	.597	263.0	1.23	.694	258.0	1.26	.801	251.0	1.32
		0.5	165.0	1.15	.300	165.0	1.15	.400	165.0	1.15	.491	165.0	1.15	.585	164.0	1.16	.722	158.0	1.21	.816	152.0	1.26
		1.0	71.5	1.08	.300	71.5	1.08	.392	71.5	1.08	.493	71.0	1.10	.596	70.5	1.10	.700	70.0	1.11	.797	69.0	1.12
	0.0	0.1	430.0	1.00	.300	430.0	1.00	.400	430.0	1.00	.500	430.0	1.00	.600	430.0	1.00	.700	430.0	1.00	.800	409.0	1.17
		0.25	299.0	1.00	.300	299.0	1.00	.400	299.0	1.00	.500	299.0	1.00	.600	299.0	1.00	.700	299.0	1.00	.800	299.0	1.00
		0.5	184.0	1.00	.300	184.0	1.00	.400	184.0	1.00	.500	184.0	1.00	.600	184.0	1.00	.700	184.0	1.00	.800	184.0	1.00
		1.0	80.0	1.00	.300	80.0	1.00	.400	80.0	1.00	.500	80.0	1.00	.600	80.0	1.00	.700	80.0	1.00	.800	80.0	1.00
	-0.98	0.1	430.0	1.00	.300	430.0	1.00	.400	430.0	1.00	.500	430.0	1.00	.600	430.0	1.00	.700	430.0	1.00	.800	430.0	1.00
		0.25	299.0	1.00	.300	299.0	1.00	.400	299.0	1.00	.500	299.0	1.00	.600	299.0	1.00	.700	299.0	1.00	.800	299.0	1.00
		0.5	184.0	1.00	.300	184.0	1.00	.400	184.0	1.00	.500	184.0	1.00	.600	184.0	1.00	.700	184.0	1.00	.800	184.0	1.00
		1.0	80.0	1.00	.300	80.0	1.00	.400	80.0	1.00	.500	80.0	1.00	.600	80.0	1.00	.700	80.0	1.00	.800	80.0	1.00
20.	1.0	0.1	305.0	2.42	.299	301.0	2.48	.399	288.0	2.67	.498	275.0	2.87	.595	262.0	3.09	.694	248.0	3.35	.797	231.0	3.71
		0.25	188.0	1.96	.295	183.0	2.02	.391	179.0	2.08	.491	175.0	2.14	.579	171.0	2.20	.691	165.0	2.30	.795	156.0	2.46
		0.5	115.0	1.55	.289	114.0	1.56	.393	112.0	1.58	.482	110.0	1.60	.579	107.0	1.63	.706	102.0	1.69	.788	99.0	1.72
		1.0	58.5	1.26	.296	57.5	1.28	.398	56.5	1.30	.491	56.0	1.31	.600	55.0	1.33	.694	54.0	1.35	.792	53.0	1.37
	0.0	0.1	363.0	1.69	.300	363.0	1.69	.400	355.0	1.79	.507	339.0	1.98	.606	322.0	2.19	.716	299.0	2.51	.799	279.0	2.80
		0.25	263.0	1.23	.310	255.0	1.29	.405	247.0	1.35	.498	239.0	1.41	.603	229.0	1.50	.699	219.0	1.59	.801	206.0	1.73
		0.5	172.0	1.09	.302	172.0	1.09	.396	169.0	1.12	.494	166.0	1.14	.606	160.0	1.20	.701	154.0	1.24	.796	147.0	1.29
		1.0	80.0	1.00	.300	80.0	1.00	.400	80.0	1.00	.500	80.0	1.00	.600	80.0	1.00	.700	80.0	1.00	.803	78.5	1.02
	-0.98	0.1	430.0	1.00	.300	430.0	1.00	.400	430.0	1.00	.500	430.0	1.00	.591	430.0	1.00	.733	405.0	1.21	.796	388.0	1.39
		0.25	299.0	1.00	.300	299.0	1.00	.400	299.0	1.00	.500	299.0	1.00	.600	299.0	1.00	.700	299.0	1.00	.800	299.0	1.00
		0.5	184.0	1.00	.300	184.0	1.00	.400	184.0	1.00	.500	184.0	1.00	.600	184.0	1.00	.700	184.0	1.00	.800	184.0	1.00
		1.0	80.0	1.00	.300	80.0	1.00	.400	80.0	1.00	.500	80.0	1.00	.600	80.0	1.00	.700	80.0	1.00	.800	80.0	1.00
30.	1.0	0.1	192.0	4.76	.308	172.0	5.47	.405	163.0	5.86	.494	156.0	6.14	.612	147.0	6.47	.695	141.0	6.67	.785	135.0	6.90
		0.25	114.0	3.12	.294	109.0	3.22	.383	107.0	3.26	.457	105.0	3.30	.634	101.0	3.38	.714	98.0	3.47	.809	94.0	3.57
		0.5	77.5	2.04	.297	74.0	2.11	.386	72.5	2.15	.476	71.5	2.17	.594	69.0	2.24	.694	67.0	2.28	.792	65.0	2.34
		1.0	45.5	1.54	.295	44.0	1.57	.391	43.5	1.60	.494	42.5	1.62	.595	42.0	1.63	.707	41.0	1.66	.813	40.0	1.71
	0.0	0.1	243.0	3.45	.305	239.0	3.53	.414	227.0	3.79	.507	215.0	4.09	.604	202.0	4.44	.707	188.0	4.89	.791	177.0	5.28
		0.25	163.0	2.34	.299	147.0	2.59	.411	141.0	2.67	.496	137.0	2.73	.594	133.0	2.80	.690	129.0	2.84	.803	122.0	2.96
		0.5	111.5	1.58	.308	107.0	1.63	.400	105.0	1.65	.498	102.5	1.68	.595	100.0	1.71	.699	96.5	1.75	.804	92.0	1.81
		1.0	69.0	1.12	.308	66.5	1.15	.397	65.5	1.16	.488	64.5	1.17	.595	63.0	1.19	.691	61.5	1.22	.807	59.5	1.25
	-0.98	0.1	313.0	2.31	.300	313.0	2.31	.400	313.0	2.31	.500	313.0	2.31	.600	313.0	2.31	.690	313.0	2.31	.801	291.0	2.62
		0.25	278.0	1.13	.299	278.0	1.13	.391	276.0	1.14	.508	266.0	1.21	.598	256.0	1.28	.686	245.0	1.36	.794	228.0	1.51
		0.5	184.0	1.00	.300	184.0	1.00	.400	184.0	1.00	.500	184.0	1.00	.606	181.5	1.02	.709	175.5	1.07	.802	167.0	1.14
		1.0	80.0	1.00	.300	80.0	1.00	.400	80.0	1.00	.500	80.0	1.00	.600	80.0	1.00	.700	80.0	1.00	.800	80.0	1.00

ANALYTICAL RESULTS - COLUMN 19

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	297.0	1.25	.300	297.0	1.25	.401	297.0	1.25	.498	295.0	1.29	.599	289.0	1.39	.693	280.0	1.58	.793	262.0	1.93
		0.25	218.0	1.17	.300	218.0	1.17	.399	218.0	1.17	.502	217.0	1.18	.600	215.0	1.20	.703	210.0	1.26	.787	202.0	1.35
		0.5	147.0	1.12	.300	147.0	1.12	.400	147.0	1.12	.500	147.0	1.12	.600	147.0	1.12	.687	147.0	1.12	.790	143.0	1.17
		1.0	85.5	1.07	.298	85.5	1.07	.400	85.0	1.07	.512	84.0	1.08	.617	83.5	1.09	.707	82.0	1.10	.806	80.0	1.13
	0.0	0.1	315.0	1.00	.300	315.0	1.00	.400	315.0	1.00	.500	315.0	1.00	.600	315.0	1.00	.705	308.0	1.07	.808	287.0	1.43
		0.25	235.0	1.00	.300	235.0	1.00	.400	235.0	1.00	.500	235.0	1.00	.600	235.0	1.00	.700	235.0	1.00	.816	228.0	1.07
		0.5	158.0	1.00	.300	158.0	1.00	.400	158.0	1.00	.500	158.0	1.00	.600	158.0	1.00	.700	158.0	1.00	.800	158.0	1.00
		1.0	92.0	1.00	.300	92.0	1.00	.400	92.0	1.00	.500	92.0	1.00	.600	92.0	1.00	.700	92.0	1.00	.800	92.0	1.00
	-0.98	0.1	315.0	1.00	.300	315.0	1.00	.400	315.0	1.00	.500	315.0	1.00	.600	315.0	1.00	.700	315.0	1.00	.800	315.0	1.00
		0.25	235.0	1.00	.300	235.0	1.00	.400	235.0	1.00	.500	235.0	1.00	.600	235.0	1.00	.700	235.0	1.00	.800	235.0	1.00
		0.5	158.0	1.00	.300	158.0	1.00	.400	158.0	1.00	.500	158.0	1.00	.600	158.0	1.00	.700	158.0	1.00	.800	158.0	1.00
		1.0	92.0	1.00	.300	92.0	1.00	.400	92.0	1.00	.500	92.0	1.00	.600	92.0	1.00	.700	92.0	1.00	.800	92.0	1.00
20.	1.0	0.1	249.0	2.19	.299	241.0	2.37	.395	233.0	2.55	.493	225.0	2.74	.585	217.0	2.94	.702	205.0	3.28	.793	193.0	3.65
		0.25	176.0	1.70	.300	170.0	1.80	.398	166.0	1.87	.494	162.0	1.94	.591	159.0	2.00	.699	153.0	2.12	.788	146.0	2.27
		0.5	121.0	1.48	.298	121.0	1.48	.387	119.0	1.51	.487	117.0	1.55	.593	115.0	1.58	.703	111.0	1.66	.798	104.0	1.79
		1.0	71.0	1.25	.296	71.0	1.25	.403	69.5	1.27	.511	68.5	1.29	.612	67.0	1.31	.697	66.0	1.33	.803	63.5	1.37
	0.0	0.1	284.0	1.49	.306	278.0	1.60	.404	270.0	1.76	.498	261.0	1.93	.604	250.0	2.17	.714	234.0	2.53	.803	218.0	2.92
		0.25	221.0	1.14	.301	216.0	1.19	.405	210.0	1.26	.493	205.0	1.31	.601	198.0	1.40	.704	189.0	1.52	.802	177.0	1.69
		0.5	156.0	1.03	.300	156.0	1.03	.391	156.0	1.03	.494	154.0	1.05	.596	151.0	1.08	.694	147.0	1.12	.799	139.0	1.22
		1.0	92.0	1.00	.300	92.0	1.00	.400	92.0	1.00	.500	92.0	1.00	.600	92.0	1.00	.690	92.0	1.00	.793	89.5	1.02
	-0.99	0.1	315.0	1.00	.300	315.0	1.00	.400	315.0	1.00	.502	315.0	1.00	.604	308.0	1.07	.719	292.0	1.34	.804	275.0	1.67
		0.25	235.0	1.00	.300	235.0	1.00	.400	235.0	1.00	.500	235.0	1.00	.600	235.0	1.00	.700	235.0	1.00	.815	227.0	1.08
		0.5	158.0	1.00	.300	158.0	1.00	.400	158.0	1.00	.500	158.0	1.00	.600	158.0	1.00	.700	158.0	1.00	.800	158.0	1.00
		1.0	92.0	1.00	.300	92.0	1.00	.400	92.0	1.00	.500	92.0	1.00	.600	92.0	1.00	.700	92.0	1.00	.800	92.0	1.00
30.	1.0	0.1	178.0	4.18	.295	173.0	4.38	.392	166.0	4.67	.484	159.0	4.99	.576	151.0	5.40	.702	141.0	5.96	.806	134.0	6.43
		0.25	127.0	2.77	.300	120.0	3.00	.402	117.0	3.10	.491	114.0	3.21	.600	110.0	3.36	.692	107.0	3.47	.779	104.0	3.57
		0.5	91.5	2.01	.299	88.5	2.07	.397	87.0	2.10	.503	84.5	2.15	.604	82.0	2.21	.700	80.0	2.26	.809	76.0	2.35
		1.0	55.5	1.54	.297	55.5	1.54	.391	55.0	1.55	.491	54.0	1.57	.585	53.0	1.59	.699	51.5	1.64	.810	50.0	1.67
	0.0	0.1	209.0	3.16	.301	209.0	3.16	.408	201.0	3.39	.511	190.0	3.75	.612	178.0	4.18	.702	168.0	4.58	.797	158.0	5.05
		0.25	164.0	1.91	.308	156.0	2.06	.410	148.0	2.22	.493	144.0	2.32	.606	137.0	2.49	.689	132.0	2.63	.794	126.0	2.81
		0.5	122.5	1.46	.308	117.0	1.55	.402	114.5	1.60	.498	111.5	1.65	.594	108.5	1.71	.692	105.5	1.76	.801	100.5	1.85
		1.0	83.5	1.09	.302	81.0	1.11	.403	79.5	1.14	.490	78.5	1.15	.601	76.5	1.18	.691	74.5	1.20	.803	71.0	1.25
	-0.98	0.1	254.0	2.09	.300	254.0	2.09	.400	254.0	2.09	.488	254.0	2.09	.607	247.0	2.23	.714	234.0	2.53	.795	220.0	2.87
		0.25	232.0	1.03	.304	230.0	1.05	.400	225.0	1.10	.498	219.0	1.16	.594	212.0	1.23	.698	202.0	1.35	.794	189.0	1.52
		0.5	153.0	1.00	.300	158.0	1.00	.400	158.0	1.00	.500	158.0	1.00	.600	158.0	1.00	.690	158.0	1.00	.799	151.5	1.08
		1.0	92.0	1.00	.300	92.0	1.00	.400	92.0	1.00	.500	92.0	1.00	.600	92.0	1.00	.700	92.0	1.00	.800	92.0	1.00

ANALYTICAL RESULTS - COLUMN 20

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	413.0	1.29	.300	413.0	1.29	.400	413.0	1.29	.501	413.0	1.29	.600	410.0	1.32	.696	398.0	1.48	.805	380.0	1.71
		0.25	295.0	1.18	.300	295.0	1.15	.400	295.0	1.18	.500	295.0	1.19	.597	295.0	1.18	.694	291.0	1.21	.796	285.0	1.26
		0.5	192.0	1.14	.300	192.0	1.14	.400	192.0	1.14	.500	192.0	1.14	.600	192.0	1.14	.698	192.0	1.14	.800	185.0	1.20
		1.0	91.0	1.09	.300	91.0	1.09	.401	91.0	1.09	.503	90.5	1.09	.600	90.0	1.09	.698	89.5	1.10	.802	83.5	1.11
	0.0	0.1	443.0	1.00	.300	443.0	1.00	.400	443.0	1.00	.500	443.0	1.00	.600	443.0	1.00	.691	443.0	1.00	.796	427.0	1.12
		0.25	322.0	1.00	.300	322.0	1.00	.400	322.0	1.00	.500	322.0	1.00	.600	322.0	1.00	.700	322.0	1.00	.800	322.0	1.00
		0.5	210.0	1.00	.300	210.0	1.00	.400	210.0	1.00	.500	210.0	1.00	.600	210.0	1.00	.700	210.0	1.00	.800	210.0	1.00
		1.0	101.0	1.00	.300	101.0	1.00	.400	101.0	1.00	.500	101.0	1.00	.600	101.0	1.00	.700	101.0	1.00	.800	101.0	1.00
	-0.98	0.1	443.0	1.00	.300	443.0	1.00	.400	443.0	1.00	.500	443.0	1.00	.600	443.0	1.00	.700	443.0	1.00	.800	443.0	1.00
		0.25	322.0	1.00	.300	322.0	1.00	.400	322.0	1.00	.500	322.0	1.00	.600	322.0	1.00	.700	322.0	1.00	.800	322.0	1.00
		0.5	210.0	1.00	.300	210.0	1.00	.400	210.0	1.00	.500	210.0	1.00	.600	210.0	1.00	.700	210.0	1.00	.800	210.0	1.00
		1.0	101.0	1.00	.300	101.0	1.00	.400	101.0	1.00	.500	101.0	1.00	.600	101.0	1.00	.700	101.0	1.00	.800	101.0	[illegible]
20.	1.0	0.1	339.0	2.26	.306	330.0	2.39	.396	321.0	2.52	.494	310.0	2.70	.591	298.0	2.90	.696	283.0	3.18	.810	263.0	3.59
		0.25	229.0	1.77	.299	221.0	1.87	.396	217.0	1.92	.495	212.0	1.98	.597	208.0	2.04	.697	201.0	2.14	.797	192.0	2.28
		0.5	150.0	1.47	.301	146.0	1.50	.406	143.0	1.52	.507	140.0	1.56	.618	136.0	1.59	.705	132.0	1.63	.803	127.0	1.68
		1.0	74.5	1.27	.300	74.5	1.27	.389	74.5	1.27	.486	74.0	1.26	.593	72.5	1.29	.704	71.0	1.31	.800	74.0	[illegible]
	0.0	0.1	389.0	1.61	.299	388.0	1.61	.399	378.0	1.73	.500	366.0	1.89	.606	350.0	2.10	.716	328.0	2.42	.802	308.0	2.73
		0.25	298.0	1.16	.305	292.0	1.20	.404	285.0	1.26	.495	277.0	1.32	.597	268.0	1.39	.707	256.0	1.50	.802	243.0	1.62
		0.5	205.0	1.04	.300	205.0	1.04	.390	205.0	1.04	.498	201.0	1.07	.591	198.0	1.09	.711	190.0	1.16	.811	160.0	1.24
		1.0	101.0	1.00	.300	101.0	1.00	.400	101.0	1.00	.500	101.0	1.00	.600	101.0	1.00	.700	101.0	1.00	.805	100.5	[illegible]
	-0.98	0.1	443.0	1.00	.300	443.0	1.00	.400	443.0	1.00	.500	443.0	1.00	.589	443.0	1.00	.723	423.0	1.17	.800	404.0	1.40
		0.25	322.0	1.00	.300	322.0	1.00	.400	322.0	1.00	.500	322.0	1.00	.600	322.0	1.00	.700	322.0	1.00	.800	322.0	1.00
		0.5	210.0	1.00	.300	210.0	1.00	.400	210.0	1.00	.500	210.0	1.00	.600	210.0	1.00	.700	210.0	1.00	.800	210.0	1.00
		1.0	101.0	1.00	.300	101.0	1.00	.400	101.0	1.00	.500	101.0	1.00	.600	101.0	1.00	.700	101.0	1.00	.800	101.0	[illegible]
30.	1.0	0.1	231.0	4.38	.298	225.0	4.56	.385	218.0	4.77	.478	209.0	5.05	.573	199.0	5.43	.699	186.0	5.96	.797	177.0	6.32
		0.25	155.0	2.85	.299	147.0	2.99	.399	143.0	3.05	.493	140.0	3.11	.596	136.0	3.18	.702	131.0	3.28	.795	127.0	3.35
		0.5	103.5	1.97	.289	102.0	2.00	.387	99.5	2.03	.487	97.5	2.06	.584	95.0	2.11	.701	92.0	2.14	.813	88.0	2.23
		1.0	59.0	1.51	.302	58.0	1.52	.400	57.5	1.54	.500	57.0	1.55	.593	56.5	1.56	.703	55.5	1.58	.798	54.5	[illegible]
	0.0	0.1	278.0	3.28	.299	278.0	3.28	.396	273.0	3.37	.508	258.0	3.69	.609	243.0	4.06	.711	228.0	4.46	.804	214.0	[illegible]
		0.25	207.0	2.05	.315	197.0	2.20	.408	191.0	2.29	.503	183.0	2.43	.597	176.0	2.54	.692	169.0	2.65	.801	161.0	2.77
		0.5	150.5	1.46	.315	143.0	1.52	.404	140.0	1.56	.496	137.0	1.58	.598	133.0	1.62	.698	129.0	1.66	.790	124.0	1.70
		1.0	90.0	1.09	.302	89.5	1.10	.398	88.0	1.11	.486	86.5	1.13	.588	85.0	1.14	.699	83.0	1.17	.801	90.5	1.19
	-0.99	0.1	345.0	2.17	.300	345.0	2.17	.400	345.0	2.17	.500	345.0	2.17	.600	345.0	2.17	.721	330.0	2.39	.804	311.0	2.68
		0.25	315.0	1.05	.302	315.0	1.05	.399	308.0	1.09	.495	301.0	1.14	.601	291.0	1.21	.705	278.0	1.31	.802	262.0	1.44
		0.5	210.0	1.00	.300	210.0	1.00	.400	210.0	1.00	.500	210.0	1.00	.600	210.0	1.00	.690	210.0	1.00	.766	206.0	1.03
		1.0	101.0	1.00	.300	101.0	1.00	.400	101.0	1.00	.500	101.0	1.00	.600	101.0	1.00	.700	101.0	1.00	[illegible]	[illegible]	[illegible]

ANALYTICAL RESULTS - COLUMN 21

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	345.0	1.26	.300	345.0	1.26	.400	345.0	1.26	.512	338.0	1.35	.627	330.0	1.47	.703	320.0	1.61	.796	304.0	1.87
		0.25	243.0	1.19	.300	243.0	1.19	.399	243.0	1.19	.508	240.0	1.22	.616	237.0	1.24	.739	230.0	1.31	.829	217.0	1.44
		0.5	161.0	1.13	.300	161.0	1.13	.400	161.0	1.13	.500	161.0	1.13	.600	161.0	1.13	.702	161.0	1.13	.794	155.0	1.19
		1.0	97.0	1.09	.300	97.0	1.09	.400	97.0	1.09	.500	97.0	1.09	.598	97.0	1.09	.723	94.0	1.13	.809	91.5	1.16
	0.0	0.1	370.0	1.00	.300	370.0	1.00	.400	370.0	1.00	.500	370.0	1.00	.600	370.0	1.00	.702	363.0	1.04	.806	341.0	1.33
		0.25	266.0	1.00	.300	266.0	1.00	.400	266.0	1.00	.500	266.0	1.00	.600	266.0	1.00	.700	266.0	1.00	.800	266.0	1.00
		0.5	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.600	174.0	1.00	.700	174.0	1.00	.800	174.0	1.00
		1.0	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00
	-0.98	0.1	370.0	1.00	.300	370.0	1.00	.400	370.0	1.00	.500	370.0	1.00	.600	370.0	1.00	.700	370.0	1.00	.800	370.0	1.00
		0.25	266.0	1.00	.300	266.0	1.00	.400	266.0	1.00	.500	266.0	1.00	.600	266.0	1.00	.700	266.0	1.00	.800	266.0	1.00
		0.5	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.600	174.0	1.00	.700	174.0	1.00	.800	174.0	1.00
		1.0	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00
20.	1.0	0.1	274.0	2.36	.306	268.0	2.48	.433	254.0	2.74	.573	239.0	3.05	.573	239.0	3.06	.735	223.0	3.44	.779	217.0	3.60
		0.25	187.0	1.82	.308	182.0	1.89	.424	177.0	1.97	.547	172.0	2.06	.675	166.0	2.16	.675	166.0	2.16	.780	159.0	2.30
		0.5	128.0	1.54	.297	128.0	1.54	.405	126.0	1.57	.516	124.0	1.60	.631	122.0	1.64	.783	115.0	1.76	.805	113.0	1.80
		1.0	80.0	1.31	.300	80.0	1.31	.405	79.0	1.32	.513	78.0	1.34	.632	76.0	1.37	.773	72.0	1.42	.797	71.5	1.43
	0.0	0.1	320.0	1.61	.301	319.0	1.63	.418	306.0	1.83	.502	295.0	2.02	.601	281.0	2.25	.698	268.0	2.48	.790	252.0	2.78
		0.25	242.0	1.20	.311	235.0	1.26	.427	227.0	1.34	.505	222.0	1.39	.603	214.0	1.47	.692	208.0	1.54	.801	196.0	1.69
		0.5	169.0	1.05	.302	169.0	1.05	.407	167.0	1.07	.518	164.0	1.10	.593	162.0	1.12	.701	157.0	1.17	.805	149.0	1.26
		1.0	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.689	103.0	1.00	.819	99.5	1.06
	-0.98	0.1	370.0	1.00	.300	370.0	1.00	.400	370.0	1.00	.500	370.0	1.00	.615	361.0	1.04	.693	349.0	1.20	.800	325.0	1.54
		0.25	266.0	1.00	.300	266.0	1.00	.400	266.0	1.00	.500	266.0	1.00	.600	266.0	1.00	.699	266.0	1.00	.795	264.0	1.02
		0.5	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.600	174.0	1.00	.700	174.0	1.00	.800	174.0	1.00
		1.0	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00
30.	1.0	0.1	170.0	5.23	.307	166.0	5.41	.422	161.0	5.65	.548	155.0	5.94	.548	155.0	5.94	.703	145.0	6.50	.804	138.0	6.96
		0.25	125.0	3.17	.309	123.0	3.24	.413	121.0	3.31	.538	117.0	3.44	.670	112.0	3.64	.670	112.0	3.64	.794	107.0	3.86
		0.5	94.0	2.26	.301	93.0	2.28	.418	91.0	2.33	.528	89.0	2.38	.651	86.0	2.45	.651	86.0	2.45	.793	82.0	2.56
		1.0	61.0	1.64	.303	61.0	1.64	.405	60.5	1.64	.508	60.0	1.66	.629	58.0	1.71	.759	56.0	1.76	.793	55.5	1.77
	0.0	0.1	206.0	3.92	.304	204.0	3.97	.421	195.0	4.27	.508	187.0	4.55	.600	180.0	4.81	.702	171.0	5.18	.807	161.0	5.65
		0.25	156.0	2.35	.305	154.0	2.40	.413	150.0	2.49	.507	146.0	2.58	.603	141.0	2.71	.691	136.0	2.84	.800	130.0	3.02
		0.5	123.0	1.62	.306	121.0	1.65	.415	118.0	1.71	.500	116.0	1.74	.593	113.0	1.80	.706	109.0	1.89	.801	105.5	1.36
		1.0	89.0	1.19	.299	88.5	1.20	.410	86.5	1.22	.527	84.5	1.24	.596	83.0	1.26	.691	81.0	1.29	.805	77.0	1.35
	-0.98	0.1	264.0	2.55	.300	264.0	2.55	.400	264.0	2.55	.500	264.0	2.55	.600	264.0	2.55	.701	264.0	2.55	.800	255.0	2.73
		0.25	248.0	1.15	.298	248.0	1.15	.402	246.0	1.16	.523	237.0	1.24	.600	230.0	1.31	.695	220.0	1.41	.801	206.0	1.57
		0.5	174.0	1.00	.300	174.0	1.00	.400	174.0	1.00	.500	174.0	1.00	.598	174.0	1.00	.682	173.0	1.02	.798	163.0	1.11
		1.0	103.0	1.00	.300	103.0	1.00	.400	103.0	1.00	.500	103.0	1.00	.600	103.0	1.00	.700	103.0	1.00	.800	103.0	1.00

ANALYTICAL RESULTS - COLUMN 22

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	459.0	1.25	.300	459.0	1.25	.401	459.0	1.25	.503	457.0	1.28	.617	446.0	1.39	.755	425.0	1.61	.783	419.0	1.68
		0.25	316.0	1.20	.300	316.0	1.20	.399	316.0	1.20	.502	315.0	1.20	.611	311.0	1.23	.725	305.0	1.27	.787	300.0	1.30
		0.5	203.0	1.14	.300	203.0	1.14	.400	203.0	1.14	.500	203.0	1.14	.606	203.0	1.14	.700	203.0	1.14	.766	203.0	1.14
		1.0	106.0	1.09	.300	106.0	1.09	.400	106.0	1.09	.500	106.0	1.09	.604	106.0	1.09	.701	105.5	1.10	.784	104.0	1.11
	0.0	0.1	494.0	1.00	.300	494.0	1.00	.400	494.0	1.00	.500	494.0	1.00	.600	494.0	1.00	.700	494.0	1.00	.867	471.0	1.14
		0.25	350.0	1.00	.300	350.0	1.00	.400	350.0	1.00	.500	350.0	1.00	.600	350.0	1.00	.700	350.0	1.00	.810	350.0	1.00
		0.5	223.0	1.00	.300	223.0	1.00	.400	223.0	1.00	.500	223.0	1.00	.600	223.0	1.00	.700	223.0	1.00	.800	223.0	1.00
		1.0	118.0	1.00	.300	118.0	1.00	.400	118.0	1.00	.500	118.0	1.00	.600	118.0	1.00	.700	118.0	1.00	.800	118.0	1.00
	-0.98	0.1	494.0	1.00	.300	494.0	1.00	.400	494.0	1.00	.500	494.0	1.00	.600	494.0	1.00	.700	494.0	1.00	.800	494.0	1.00
		0.25	350.0	1.00	.300	350.0	1.00	.400	350.0	1.00	.500	350.0	1.00	.600	350.0	1.00	.700	350.0	1.00	.800	350.0	1.00
		0.5	223.0	1.00	.300	223.0	1.00	.400	223.0	1.00	.500	223.0	1.00	.600	223.0	1.00	.700	223.0	1.00	.800	223.0	1.00
		1.0	118.0	1.00	.300	118.0	1.00	.400	118.0	1.00	.500	118.0	1.00	.600	118.0	1.00	.700	118.0	1.00	.800	118.0	1.00
20.	1.0	0.1	357.0	2.41	.305	351.0	2.49	.427	335.0	2.70	.568	315.0	3.00	.568	315.0	3.00	.735	291.0	3.41	.812	277.0	3.67
		0.25	234.0	1.88	.307	228.0	1.95	.422	223.0	2.01	.542	216.0	2.10	.542	216.0	2.10	.670	209.0	2.19	.808	198.0	2.36
		0.5	157.0	1.58	.299	157.0	1.58	.406	155.0	1.60	.527	150.0	1.65	.628	145.0	1.71	.718	142.0	1.74	.803	137.0	1.79
		1.0	86.0	1.29	.302	86.0	1.29	.406	85.0	1.30	.512	84.0	1.31	.620	83.0	1.32	.745	80.5	1.36	.805	79.5	1.37
	0.0	0.1	422.0	1.66	.301	422.0	1.66	.401	411.0	1.78	.505	394.0	1.98	.635	375.0	2.19	.707	355.0	2.44	.799	333.0	2.73
		0.25	312.0	1.22	.308	305.0	1.27	.401	297.0	1.32	.493	288.0	1.38	.597	278.0	1.46	.700	267.0	1.56	.806	253.0	1.60
		0.5	213.0	1.07	.300	213.0	1.07	.393	211.0	1.08	.481	208.0	1.10	.593	204.0	1.13	.698	199.0	1.17	.811	190.0	1.24
		1.0	118.0	1.00	.300	118.0	1.00	.400	118.0	1.00	.500	118.0	1.00	.600	118.0	1.00	.699	118.0	1.00	.805	115.5	1.02
	-0.98	0.1	494.0	1.00	.300	494.0	1.00	.400	494.0	1.00	.500	494.0	1.00	.589	494.0	1.00	.727	469.0	1.16	.793	450.0	1.35
		0.25	350.0	1.00	.300	350.0	1.00	.400	350.0	1.00	.500	350.0	1.00	.600	350.0	1.00	.700	350.0	1.00	.800	350.0	1.00
		0.5	223.0	1.00	.300	223.0	1.00	.400	223.0	1.00	.500	223.0	1.00	.600	223.0	1.00	.700	223.0	1.00	.800	223.0	1.00
		1.0	118.0	1.00	.300	118.0	1.00	.400	118.0	1.00	.500	118.0	1.00	.600	118.0	1.00	.700	118.0	1.00	.800	118.0	1.00
30.	1.0	0.1	221.0	5.09	.322	205.0	5.63	.449	196.0	5.98	.449	196.0	5.98	.590	186.0	6.30	.751	177.0	6.82	.798	173.0	7.03
		0.25	150.0	3.29	.306	147.0	3.37	.417	144.0	3.43	.536	140.0	3.51	.657	135.0	3.61	.667	135.0	3.61	.791	129.0	3.75
		0.5	107.0	2.17	.305	105.0	2.21	.413	104.0	2.22	.529	102.0	2.26	.653	98.0	2.33	.729	96.0	2.35	.806	93.0	2.42
		1.0	66.5	1.58	.305	65.5	1.59	.411	64.5	1.62	.528	63.5	1.64	.645	62.0	1.68	.769	60.5	1.71	.800	60.0	1.72
	0.0	0.1	276.0	3.70	.304	273.0	3.76	.408	262.0	4.00	.510	249.0	4.31	.606	236.0	4.64	.704	223.0	5.01	.809	209.0	5.47
		0.25	196.0	2.39	.317	186.0	2.56	.399	183.0	2.61	.492	179.0	2.69	.601	173.0	2.81	.705	166.0	2.96	.800	160.0	3.09
		0.5	147.0	1.69	.303	145.0	1.71	.401	142.0	1.74	.496	139.0	1.76	.600	135.0	1.81	.695	131.0	1.85	.802	126.0	1.92
		1.0	99.0	1.15	.303	97.5	1.17	.401	96.0	1.18	.489	95.0	1.19	.597	93.0	1.21	.696	93.5	1.24	.794	87.5	1.27
	-0.98	0.1	356.0	2.42	.300	356.0	2.42	.400	356.0	2.42	.500	356.0	2.42	.600	356.0	2.42	.691	356.0	2.42	.797	344.0	2.55
		0.25	325.0	1.14	.302	325.0	1.14	.392	324.0	1.15	.502	315.0	1.20	.604	303.0	1.28	.688	292.0	1.36	.802	273.0	1.50
		0.5	223.0	1.00	.300	223.0	1.00	.400	223.0	1.00	.500	223.0	1.00	.601	223.0	1.00	.700	220.0	1.02	.800	213.0	1.09
		1.0	118.0	1.00	.300	118.0	1.00	.400	118.0	1.00	.500	118.0	1.00	.600	118.0	1.00	.700	118.0	1.00	.800	118.0	1.00

ANALYTICAL RESULTS - COLUMN 23

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	367.0	1.21	.300	367.0	1.21	.398	367.0	1.21	.507	361.0	1.29	.618	356.0	1.37	.751	341.0	1.61	.794	330.0	1.40
		0.25	273.0	1.16	.300	273.0	1.16	.399	273.0	1.16	.504	272.0	1.17	.610	269.0	1.20	.723	264.0	1.25	.786	257.0	1.31
		0.5	189.0	1.12	.300	189.0	1.12	.400	189.0	1.12	.500	189.0	1.12	.600	189.0	1.12	.700	189.0	1.12	.800	189.0	1.12
		1.0	118.0	1.08	.300	118.0	1.08	.400	118.0	1.08	.500	118.0	1.08	.600	118.0	1.08	.700	118.0	1.08	.802	116.0	1.11
	0.0	0.1	386.0	1.00	.300	386.0	1.00	.400	386.0	1.00	.500	386.0	1.00	.601	386.0	1.00	.696	382.0	.99	.790	366.0	1.23
		0.25	292.0	1.00	.300	292.0	1.00	.400	292.0	1.00	.500	292.0	1.00	.600	292.0	1.00	.700	292.0	1.00	.800	292.0	1.00
		0.5	202.0	1.00	.300	202.0	1.00	.400	202.0	1.00	.500	202.0	1.00	.600	202.0	1.00	.700	202.0	1.00	.800	202.0	1.00
		1.0	125.0	1.00	.300	125.0	1.00	.400	125.0	1.00	.500	125.0	1.00	.600	125.0	1.00	.700	125.0	1.00	.800	125.0	1.00
	-0.98	0.1	386.0	1.00	.300	386.0	1.00	.400	386.0	1.00	.500	386.0	1.00	.600	386.0	1.00	.700	386.0	1.00	.800	386.0	1.00
		0.25	292.0	1.00	.300	292.0	1.00	.400	292.0	1.00	.500	292.0	1.00	.600	292.0	1.00	.700	292.0	1.00	.800	292.0	1.00
		0.5	202.0	1.00	.300	202.0	1.00	.400	202.0	1.00	.500	202.0	1.00	.600	202.0	1.00	.700	202.0	1.00	.800	202.0	1.00
		1.0	125.0	1.00	.300	125.0	1.00	.400	125.0	1.00	.500	125.0	1.00	.600	125.0	1.00	.700	125.0	1.00	.800	125.0	1.00
20.	1.0	0.1	314.0	2.10	.308	305.0	2.26	.430	293.0	2.49	.430	293.0	2.49	.559	281.0	2.74	.701	268.0	3.03	.795	254.0	3.36
		0.25	227.0	1.65	.308	221.0	1.73	.421	216.0	1.80	.543	210.0	1.89	.663	205.0	1.96	.766	197.0	2.09	.785	195.0	2.12
		0.5	159.0	1.44	.302	159.0	1.44	.408	157.0	1.47	.516	155.0	1.49	.621	153.0	1.52	.760	146.0	1.62	.799	144.0	1.66
		1.0	103.0	1.27	.301	103.0	1.27	.402	102.0	1.28	.515	101.0	1.29	.626	99.0	1.32	.758	95.0	1.37	.802	93.5	1.39
	0.0	0.1	356.0	1.37	.307	348.0	1.50	.405	338.0	1.66	.495	329.0	1.82	.599	317.0	2.03	.702	305.0	2.26	.805	284.0	2.63
		0.25	278.0	1.12	.302	275.0	1.15	.401	269.0	1.20	.500	262.0	1.27	.594	256.0	1.33	.698	248.0	1.41	.796	235.0	1.55
		0.5	201.0	1.01	.300	201.0	1.01	.385	201.0	1.01	.490	200.0	1.02	.594	197.0	1.04	.694	193.0	1.08	.814	183.0	1.17
		1.0	125.0	1.00	.300	125.0	1.00	.400	125.0	1.00	.500	125.0	1.00	.600	125.0	1.00	.700	125.0	1.00	.800	125.0	1.00
	-0.99	0.1	386.0	1.00	.300	386.0	1.00	.400	386.0	1.00	.500	386.0	1.00	.602	379.0	1.04	.705	366.0	1.23	.806	341.0	1.61
		0.25	292.0	1.00	.300	292.0	1.00	.400	292.0	1.00	.500	292.0	1.00	.600	292.0	1.00	.700	292.0	1.00	.800	292.0	1.00
		0.5	202.0	1.00	.300	202.0	1.00	.400	202.0	1.00	.500	202.0	1.00	.600	202.0	1.00	.700	202.0	1.00	.800	202.0	1.00
		1.0	125.0	1.00	.300	125.0	1.00	.400	125.0	1.00	.500	125.0	1.00	.600	125.0	1.00	.700	125.0	1.00	.800	125.0	1.00
30.	1.0	0.1	234.0	3.91	.306	229.0	4.07	.429	219.0	4.39	.568	206.0	4.86	.568	206.0	4.86	.737	190.0	5.53	.804	184.0	5.82
		0.25	171.0	2.60	.311	164.0	2.76	.428	159.0	2.88	.562	153.0	3.04	.562	153.0	3.04	.701	147.0	3.22	.810	142.0	3.38
		0.5	125.0	2.00	.311	122.0	2.07	.417	120.0	2.12	.538	117.0	2.18	.652	115.0	2.23	.717	113.0	2.27	.800	110.0	2.36
		1.0	85.0	1.52	.307	83.0	1.55	.415	82.0	1.57	.528	80.5	1.60	.650	78.5	1.63	.650	78.5	1.63	.795	75.5	1.69
	0.0	0.1	270.0	2.98	.300	270.0	2.98	.398	264.0	3.11	.504	252.0	3.41	.607	239.0	3.77	.714	224.0	4.23	.794	214.0	4.57
		0.25	216.0	1.80	.313	208.0	1.92	.408	201.0	2.02	.497	195.0	2.12	.590	188.0	2.24	.704	179.0	2.42	.792	173.0	2.55
		0.5	164.0	1.38	.308	159.0	1.44	.406	155.0	1.49	.493	152.0	1.54	.595	148.0	1.59	.690	145.0	1.64	.806	139.0	1.74
		1.0	115.0	1.12	.300	115.0	1.12	.395	114.0	1.13	.493	112.5	1.15	.597	110.5	1.17	.674	109.0	1.20	.788	104.0	1.26
	-0.98	0.1	325.0	1.89	.300	325.0	1.89	.400	325.0	1.89	.498	325.0	1.89	.613	313.0	2.12	.691	304.0	2.28	.801	286.0	2.67
		0.25	291.0	1.01	.299	291.0	1.01	.396	285.0	1.06	.496	278.0	1.12	.594	271.0	1.18	.693	261.0	1.28	.807	244.0	1.45
		0.5	202.0	1.00	.300	202.0	1.00	.400	202.0	1.00	.500	202.0	1.00	.600	202.0	1.00	.688	202.0	1.00	.812	197.0	1.04
		1.0	125.0	1.00	.300	125.0	1.00	.400	125.0	1.00	.500	125.0	1.00	.600	125.0	1.00	.700	125.0	1.00	.800	125.0	1.00

ANALYTICAL RESULTS - COLUMN 24

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL	P_S/P	P_{AN}	DEL
10.	1.0	0.1	481.0	1.24	.300	481.0	1.24	.400	481.0	1.24	.501	481.0	1.24	.608	475.0	1.33	.733	466.0	1.49	.799	447.0	1.66
		0.25	352.0	1.18	.300	352.0	1.18	.400	352.0	1.18	.500	352.0	1.18	.601	351.0	1.18	.709	347.0	1.21	.795	341.0	1.25
		0.5	239.0	1.12	.300	238.0	1.12	.400	238.0	1.12	.500	238.0	1.12	.600	238.0	1.12	.700	238.0	1.12	.800	238.0	1.12
		1.0	137.0	1.06	.300	137.0	1.06	.404	136.0	1.07	.509	135.5	1.08	.610	134.5	1.08	.719	133.5	1.09	.805	131.0	1.10
	0.0	0.1	512.0	1.00	.300	512.0	1.00	.400	512.0	1.00	.500	512.0	1.00	.600	512.0	1.00	.689	512.0	1.00	.798	496.0	1.08
		0.25	381.0	1.00	.300	381.0	1.00	.400	381.0	1.00	.500	381.0	1.00	.600	381.0	1.00	.700	381.0	1.00	.800	381.0	1.00
		0.5	255.0	1.00	.300	256.0	1.00	.400	256.0	1.00	.500	256.0	1.00	.600	256.0	1.00	.700	256.0	1.00	.800	256.0	1.00
		1.0	147.0	1.00	.300	147.0	1.00	.400	147.0	1.00	.500	147.0	1.00	.600	147.0	1.00	.700	147.0	1.00	.800	147.0	1.00
	-0.98	0.1	512.0	1.00	.300	512.0	1.00	.400	512.0	1.00	.500	512.0	1.00	.600	512.0	1.00	.700	512.0	1.00	.800	512.0	1.00
		0.25	381.0	1.00	.300	381.0	1.00	.400	381.0	1.00	.500	381.0	1.00	.600	381.0	1.00	.700	381.0	1.00	.800	381.0	1.00
		0.5	255.0	1.00	.300	256.0	1.00	.400	256.0	1.00	.500	256.0	1.00	.600	256.0	1.00	.700	256.0	1.00	.800	256.0	1.00
		1.0	147.0	1.00	.300	147.0	1.00	.400	147.0	1.00	.500	147.0	1.00	.600	147.0	1.00	.700	147.0	1.00	.800	147.0	1.00
20.	1.0	0.1	404.0	2.19	.308	393.0	2.33	.427	379.0	2.53	.555	364.0	2.75	.555	364.0	2.75	.703	344.0	3.07	.793	328.0	3.35
		0.25	284.0	1.71	.308	276.0	1.79	.424	269.0	1.87	.540	263.0	1.93	.664	256.0	2.01	.664	256.0	2.01	.799	244.0	2.10
		0.5	195.0	1.49	.303	195.0	1.49	.404	193.0	1.51	.516	190.0	1.54	.629	186.0	1.58	.770	175.0	1.67	.805	175.0	1.70
		1.0	113.0	1.26	.296	113.0	1.26	.404	111.5	1.27	.509	110.0	1.29	.618	108.5	1.30	.741	106.0	1.33	.794	104.5	1.34
	0.0	0.1	459.0	1.50	.303	455.0	1.56	.401	444.0	1.69	.497	431.0	1.86	.599	416.0	2.04	.705	397.0	2.28	.804	373.0	2.61
		0.25	357.0	1.14	.304	352.0	1.18	.401	344.0	1.23	.494	336.0	1.28	.596	327.0	1.35	.703	316.0	1.43	.810	300.0	1.57
		0.5	253.0	1.02	.300	253.0	1.02	.391	253.0	1.02	.494	251.0	1.04	.593	248.0	1.06	.695	243.0	1.09	.800	235.0	1.14
		1.0	147.0	1.00	.300	147.0	1.00	.400	147.0	1.00	.500	147.0	1.00	.600	147.0	1.00	.700	147.0	1.00	.800	147.0	1.00
	-0.98	0.1	512.0	1.00	.300	512.0	1.00	.400	512.0	1.00	.500	512.0	1.00	.591	511.0	.95	.715	492.0	1.13	.799	472.0	1.35
		0.25	381.0	1.00	.300	381.0	1.00	.400	381.0	1.00	.500	381.0	1.00	.600	381.0	1.00	.700	381.0	1.00	.800	381.0	1.00
		0.5	256.0	1.00	.300	256.0	1.00	.400	256.0	1.00	.500	256.0	1.00	.600	256.0	1.00	.700	256.0	1.00	.800	256.0	1.00
		1.0	147.0	1.00	.300	147.0	1.00	.400	147.0	1.00	.500	147.0	1.00	.600	147.0	1.00	.700	147.0	1.00	.800	147.0	1.00
30.	1.0	0.1	287.0	4.21	.306	281.0	4.36	.428	269.0	4.67	.567	254.0	5.09	.567	254.0	5.09	.738	233.0	5.79	.793	227.0	6.01
		0.25	204.0	2.80	.314	194.0	3.00	.436	188.0	3.12	.557	183.0	3.24	.557	183.0	3.24	.693	176.0	3.39	.769	171.0	3.49
		0.5	147.0	2.01	.308	143.0	2.05	.414	140.0	2.09	.537	136.0	2.14	.657	132.0	2.19	.736	129.0	2.24	.810	126.0	2.29
		1.0	89.0	1.53	.300	89.0	1.53	.399	89.0	1.53	.511	87.0	1.56	.620	85.5	1.59	.753	83.0	1.63	.799	82.0	1.64
	0.0	0.1	336.0	3.21	.301	336.0	3.21	.393	333.0	3.26	.511	317.0	3.56	.608	301.0	3.89	.710	283.0	4.30	.799	266.0	4.69
		0.25	263.0	1.93	.313	252.0	2.06	.404	245.0	2.15	.498	237.0	2.26	.604	227.0	2.40	.694	219.0	2.53	.795	210.0	2.69
		0.5	197.0	1.47	.312	189.0	1.55	.405	185.0	1.60	.495	182.0	1.63	.599	177.0	1.68	.694	173.0	1.72	.792	168.0	1.78
		1.0	133.0	1.09	.307	130.5	1.11	.395	129.0	1.12	.492	127.0	1.14	.597	124.0	1.16	.691	121.5	1.18	.797	119.0	1.21
	-0.98	0.1	410.0	2.11	.300	410.0	2.11	.400	410.0	2.11	.500	410.0	2.11	.600	410.0	2.11	.724	391.0	2.36	.797	375.0	2.59
		0.25	376.0	1.03	.301	376.0	1.03	.399	368.0	1.08	.499	359.0	1.13	.593	351.0	1.18	.700	337.0	1.27	.805	318.0	1.42
		0.5	256.0	1.00	.300	256.0	1.00	.400	256.0	1.00	.500	256.0	1.00	.600	256.0	1.00	.700	256.0	1.00	.800	256.0	1.00
		1.0	147.0	1.00	.300	147.0	1.00	.400	147.0	1.00	.500	147.0	1.00	.600	147.0	1.00	.700	147.0	1.00	.800	147.0	1.00

APPENDIX D

MOMENT MAGNIFICATION GRAPHS

Figures D.1 to D.20 give the ranges of analytical moment magnifications, δ_{an}, for the 24 columns defined in Table 5.2 and the following loading conditions

$L/h = 10, 20, 30$

$e_1/e_2 = 1.0, 0.0, -0.98$

$P_{sus}/P_{an} = 0.2, 0.4, 0.6, 0.8$

Figures D.1 to D.10 are for f_y equal to 40 ksi, whereas Figures D.11 to D.20 are for f_y equal to 60 ksi.

The lines defining the upper and lower limits of each range are based on values of e/h equal to 0.1, 0.25, 0.5, and 1.0.

Values of moment magnifications were found from the tables in Appendix C by interpolating to get values at the above values of P_{sus}/P_{an}.

The upper limits of each range of moment magnifications in these graphs is the basic of the proposed method. Refer to Section 5.7 for a discussion on the use of this method.

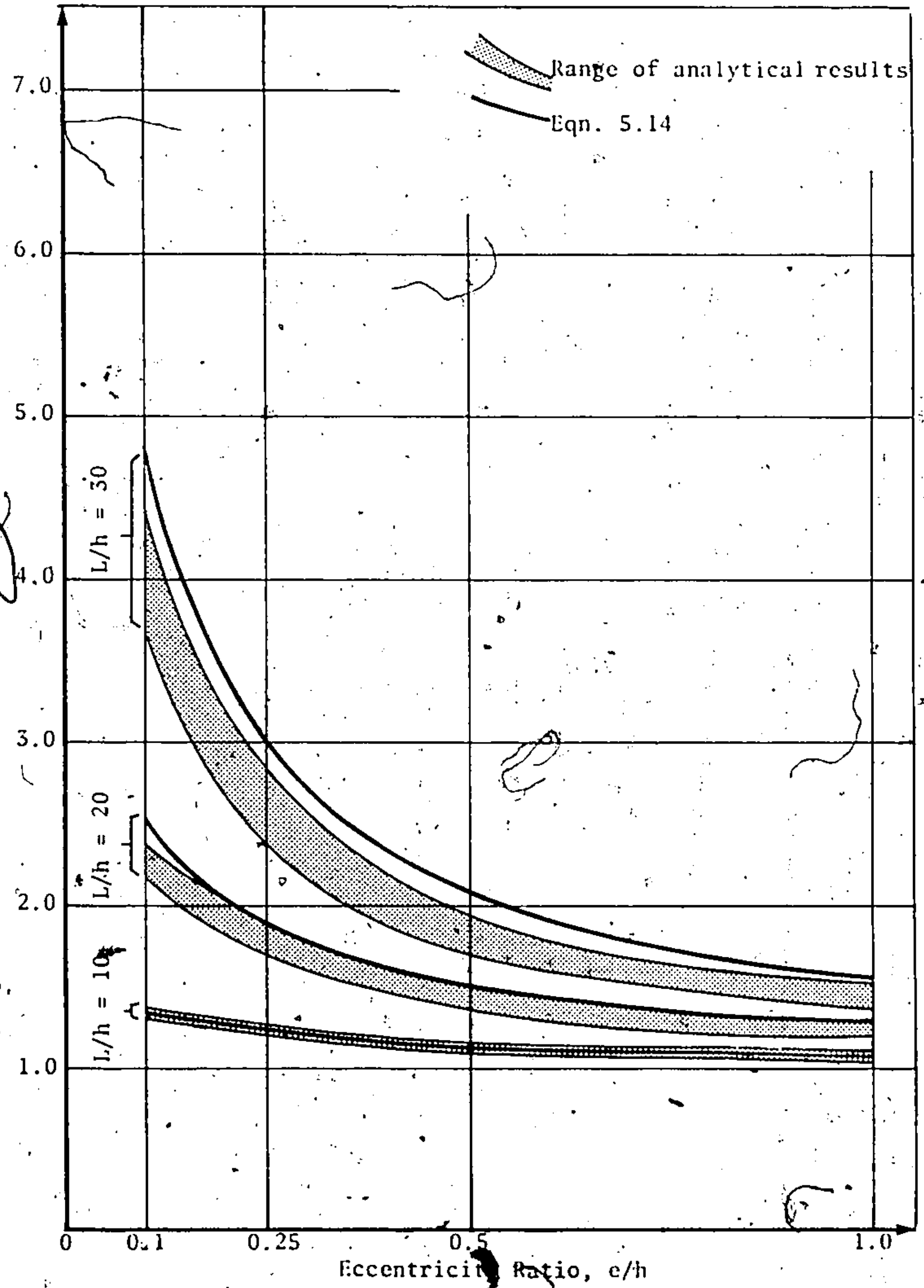

Fig. D.1 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.2

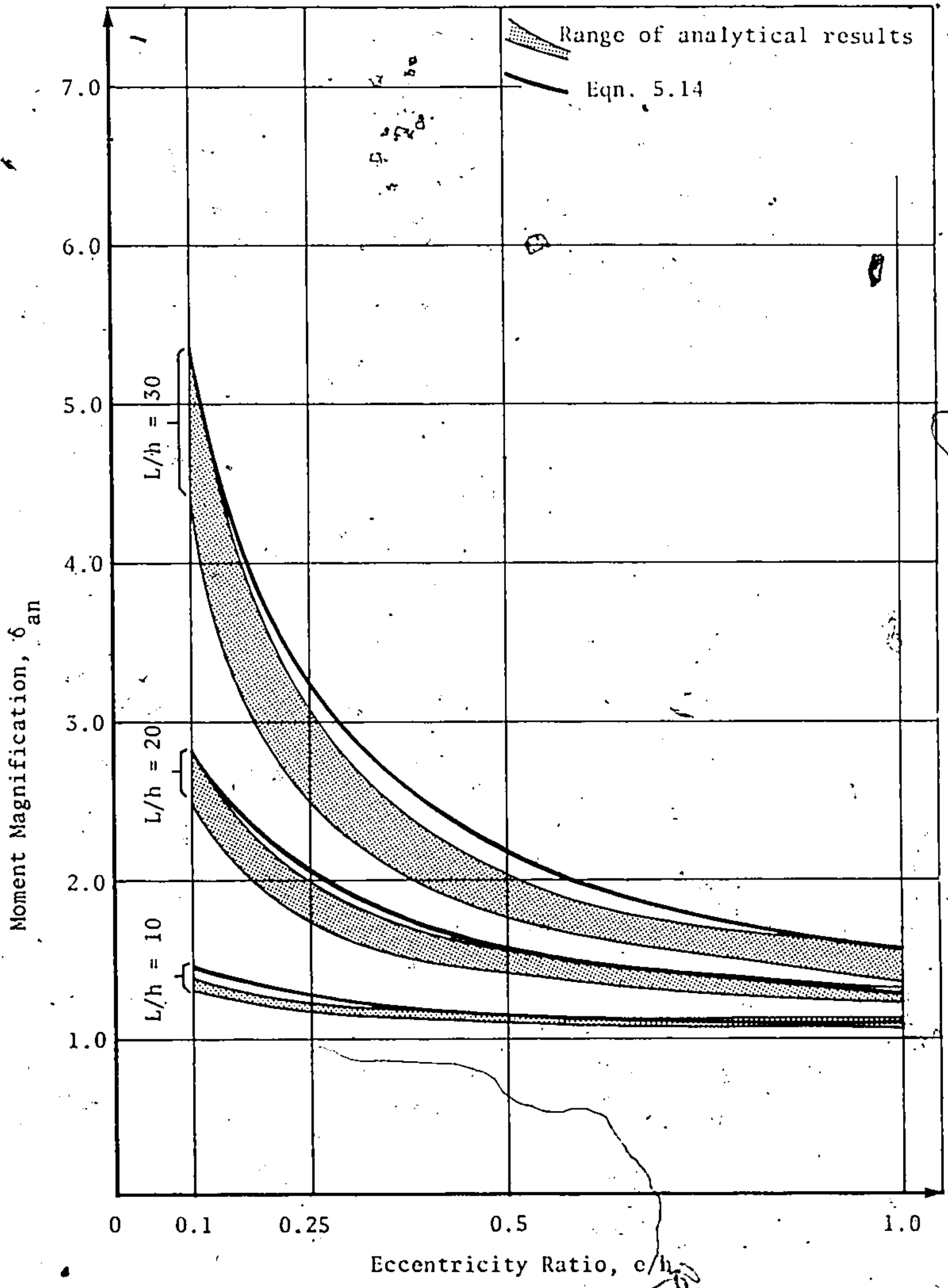

Fig. D.2 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.4

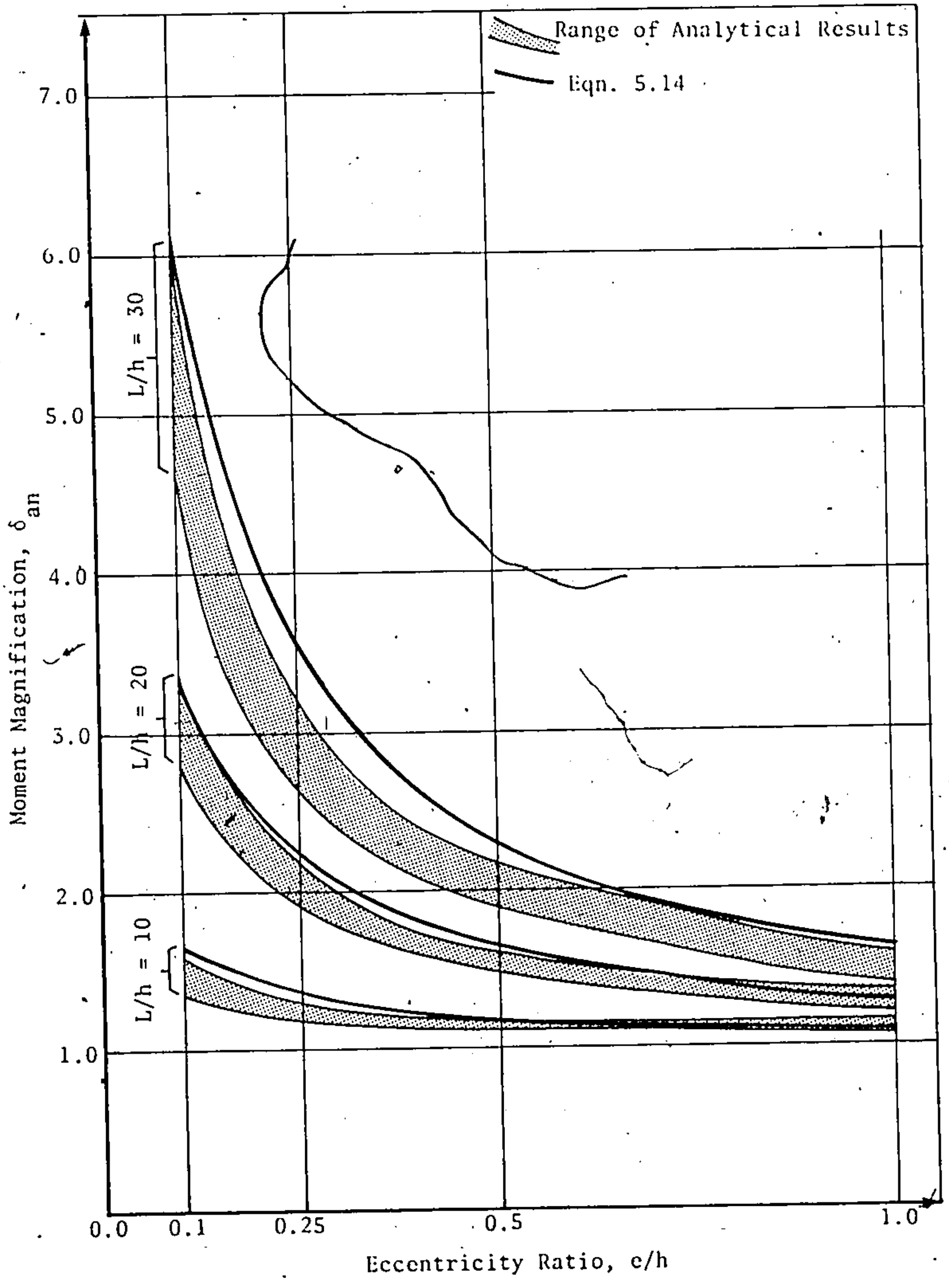

Fig. D.3 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.6

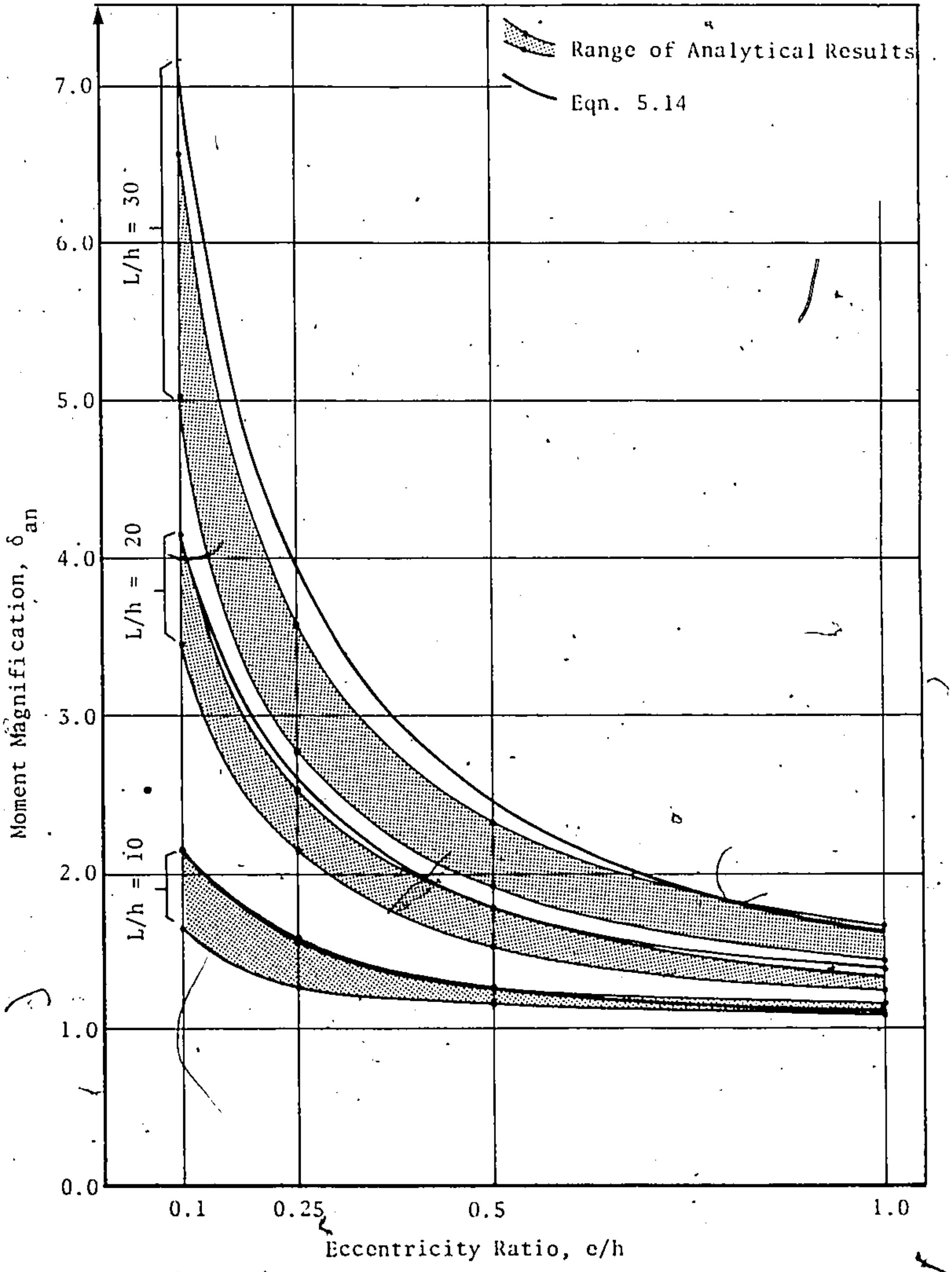

Fig. D.4 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.8

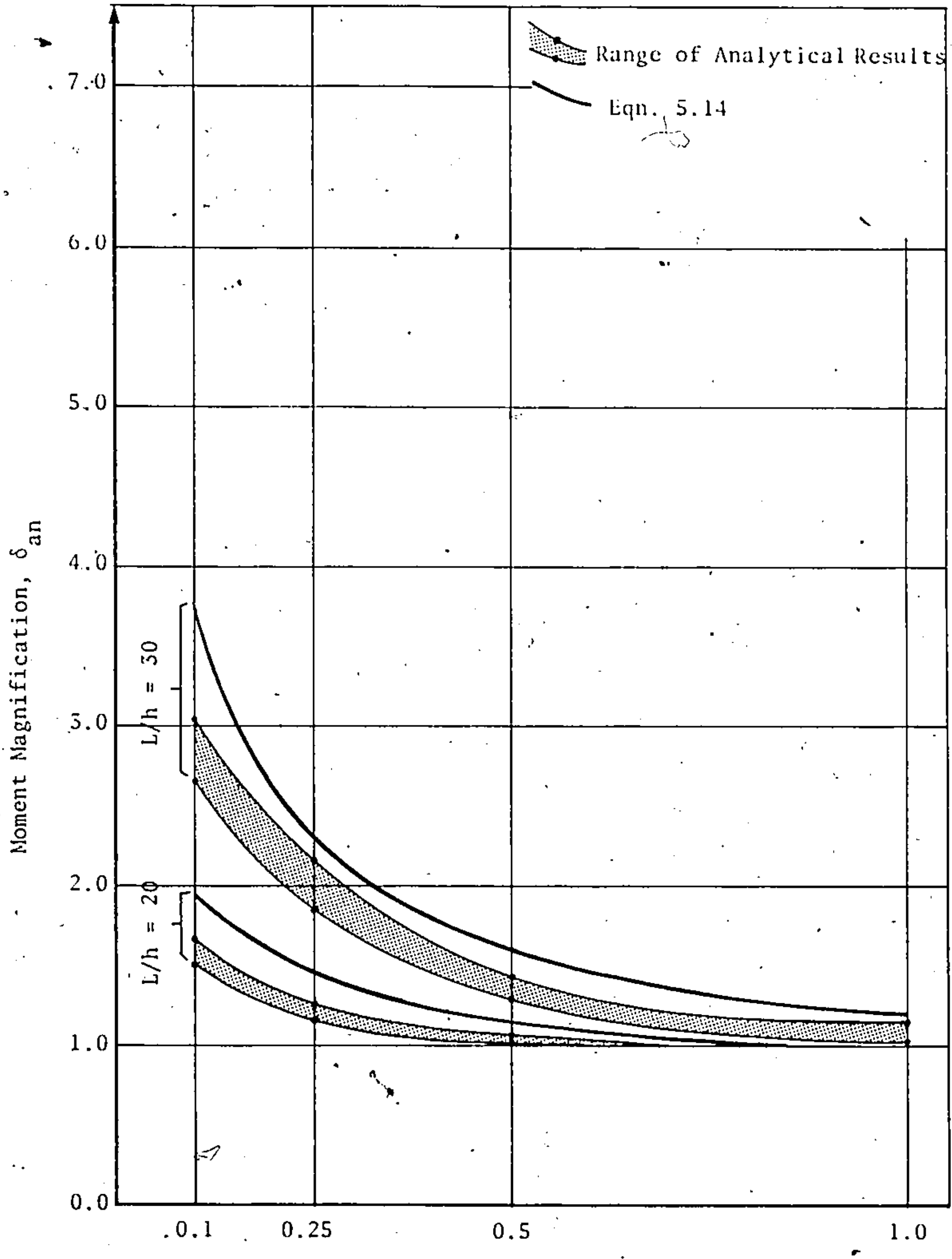

Fig. D.5 δ_{an} VERSUS e/h FOR f_y = 40 ksi, c_1/c_2 = 0.0, P_{sus}/P_{an} = 0.2

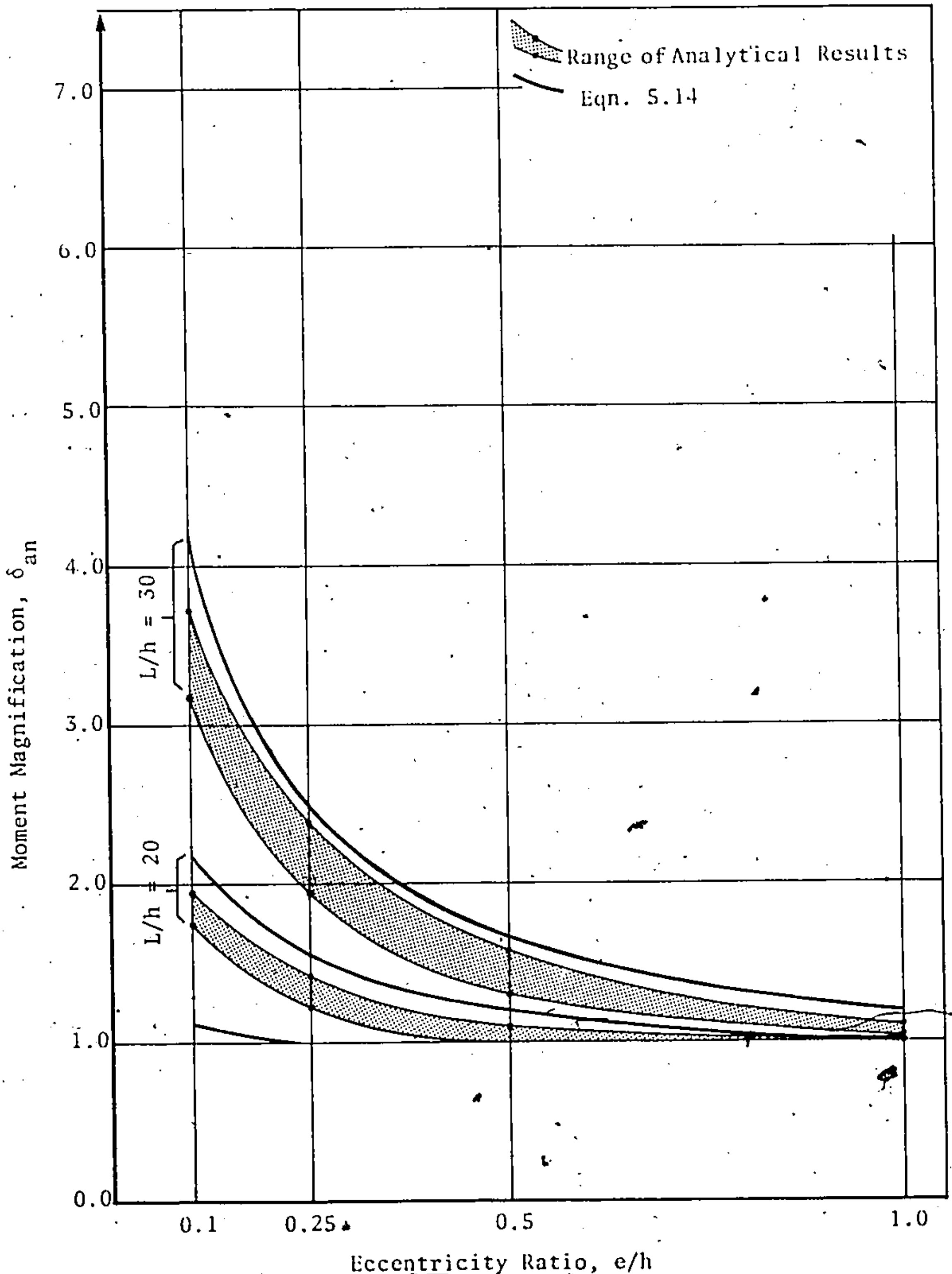

Fig. D.6 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 0.0, P_{sus}/P_{an} = 0.4

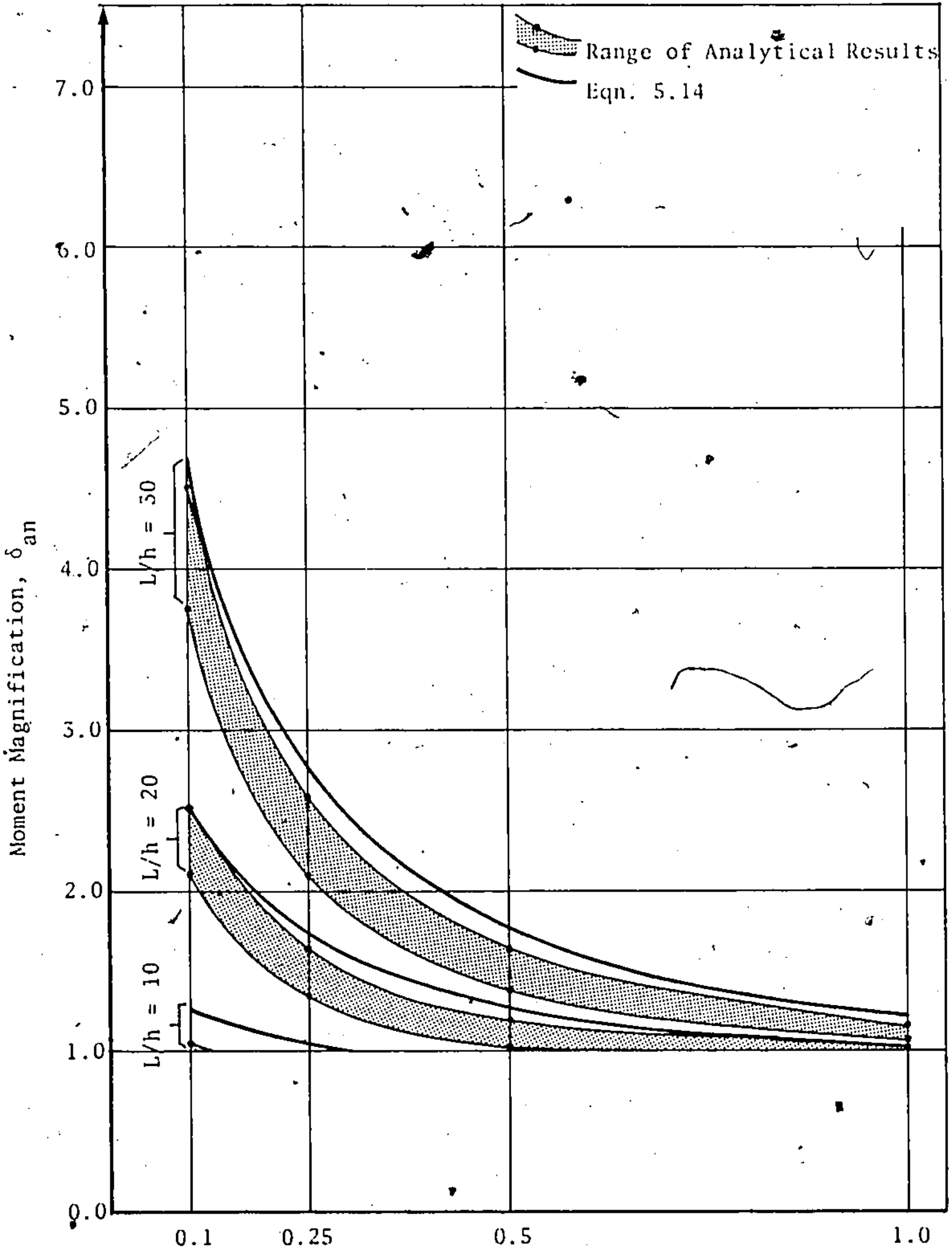

Fig. D.7 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 0.0
P_{sus}/P_{an} = 0.6

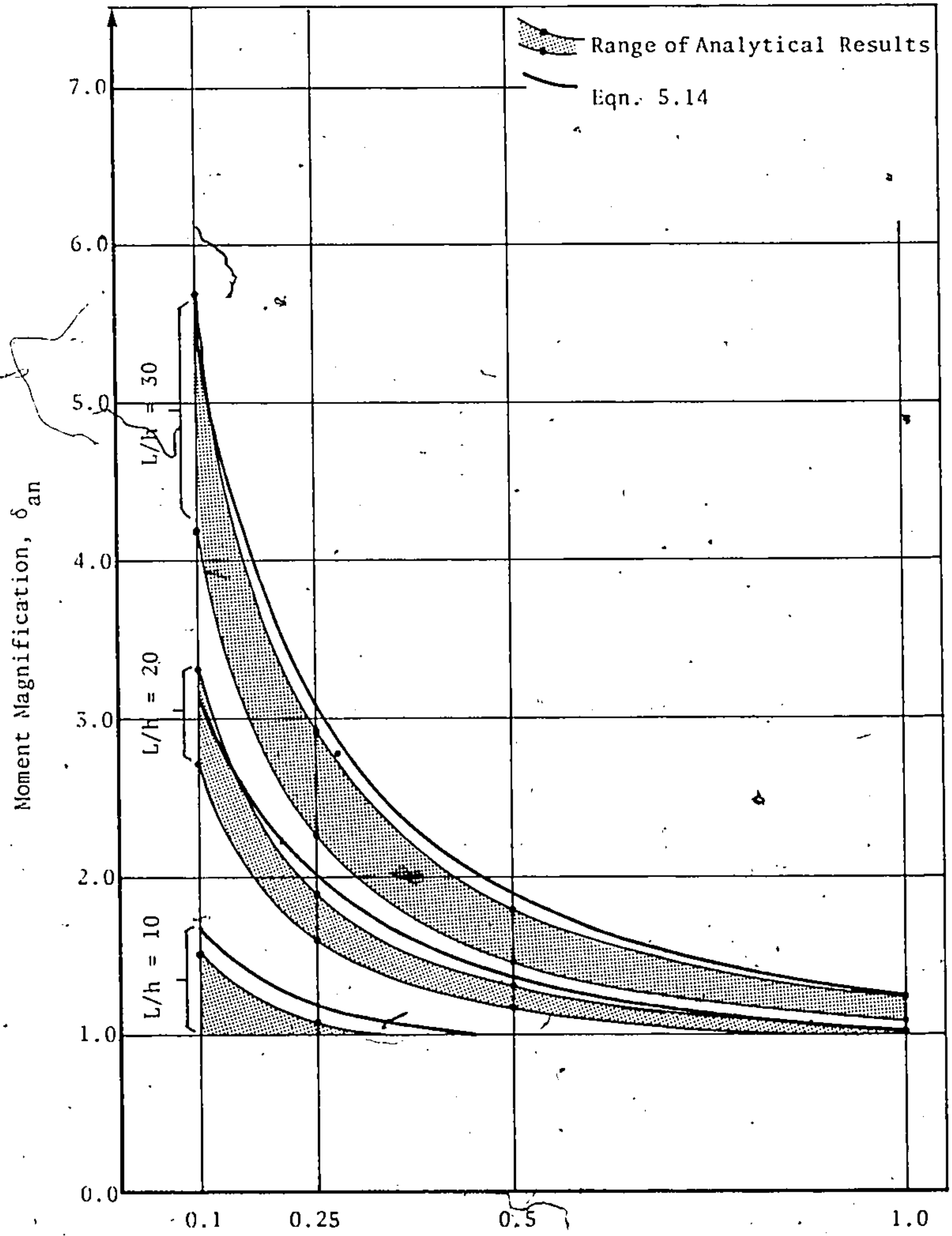

Fig. D.8 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = 0.0
P_{sus}/P_{an} = 0.8

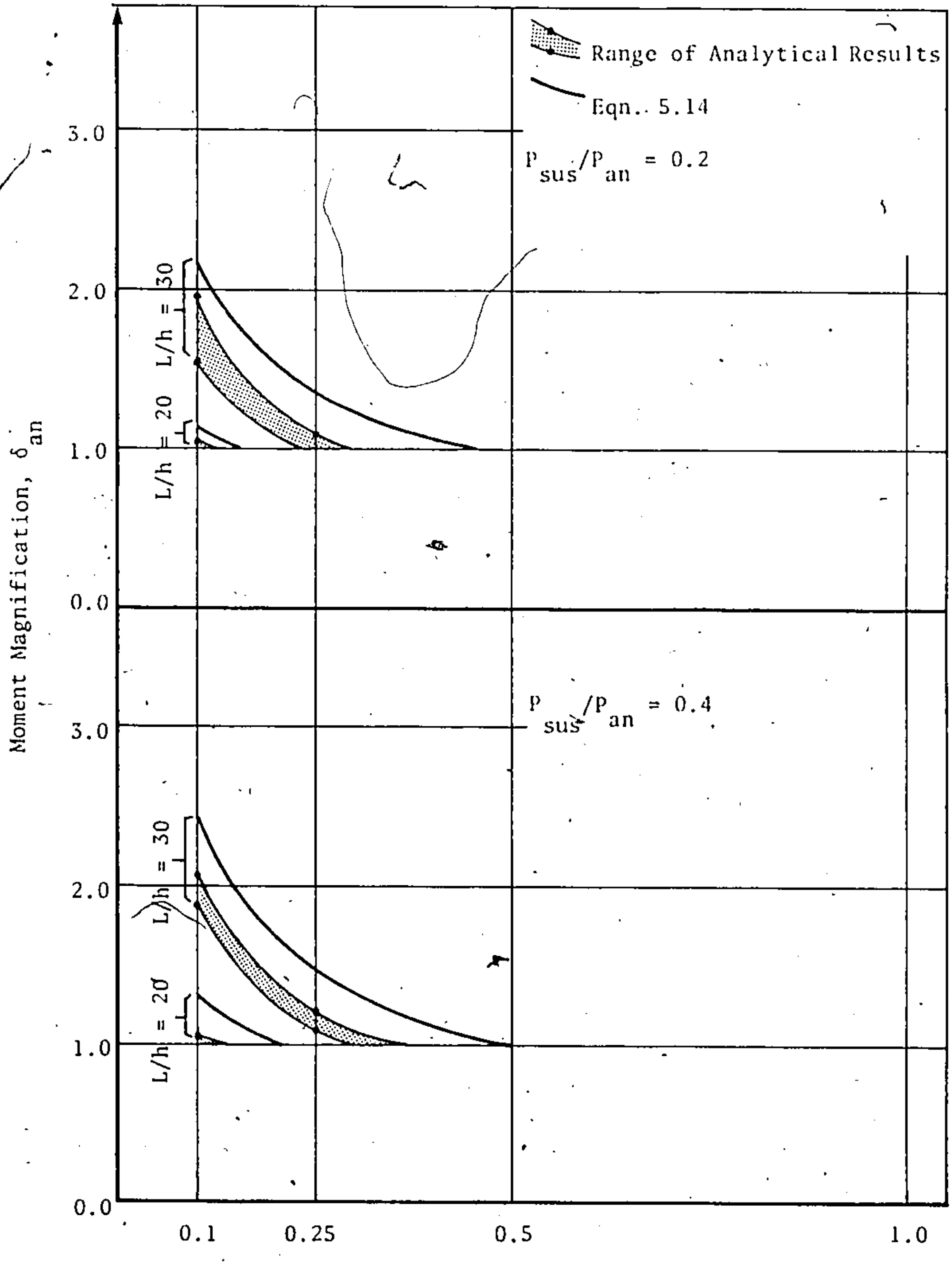

Fig. D.9 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = -0.98
P_{sus}/P_{an} = 0.2 & 0.4

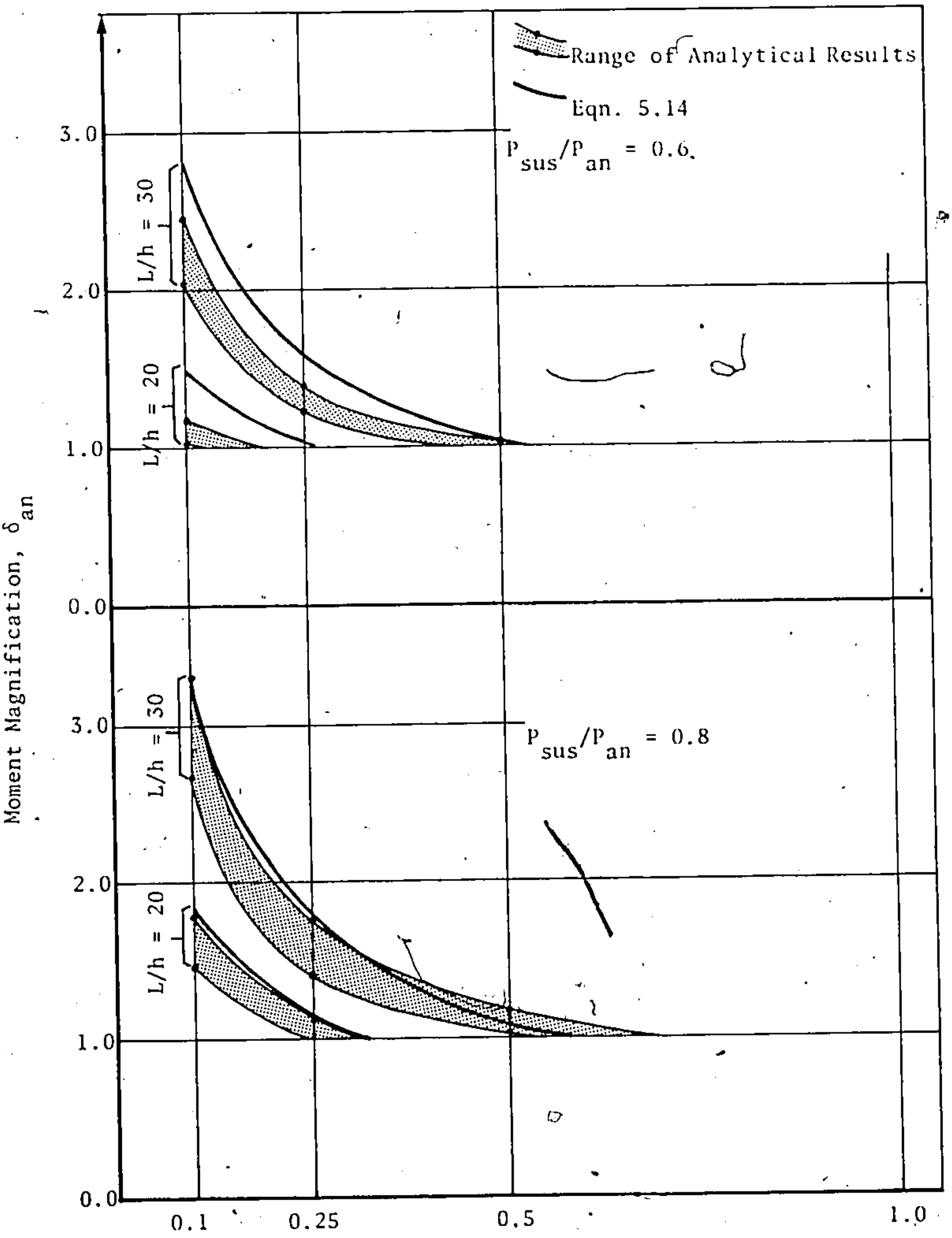

Fig. D.10 δ_{an} VERSUS e/h FOR f_y = 40 ksi, e_1/e_2 = -0.98
P_{sus}/P_{an} = 0.6 & 0.8

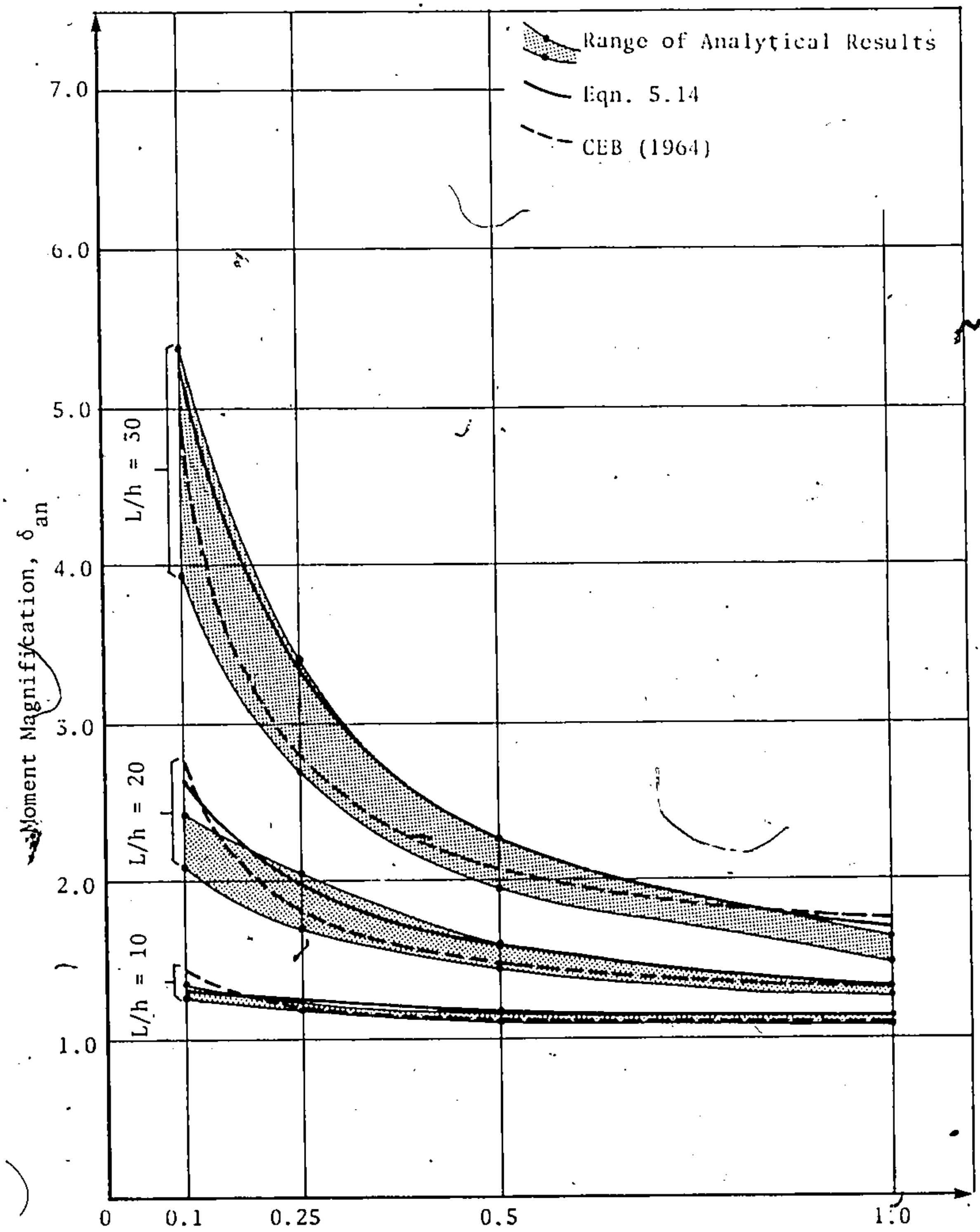

Fig. D.11 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 1.0, and P_{sus}/P_{an} = 0.2

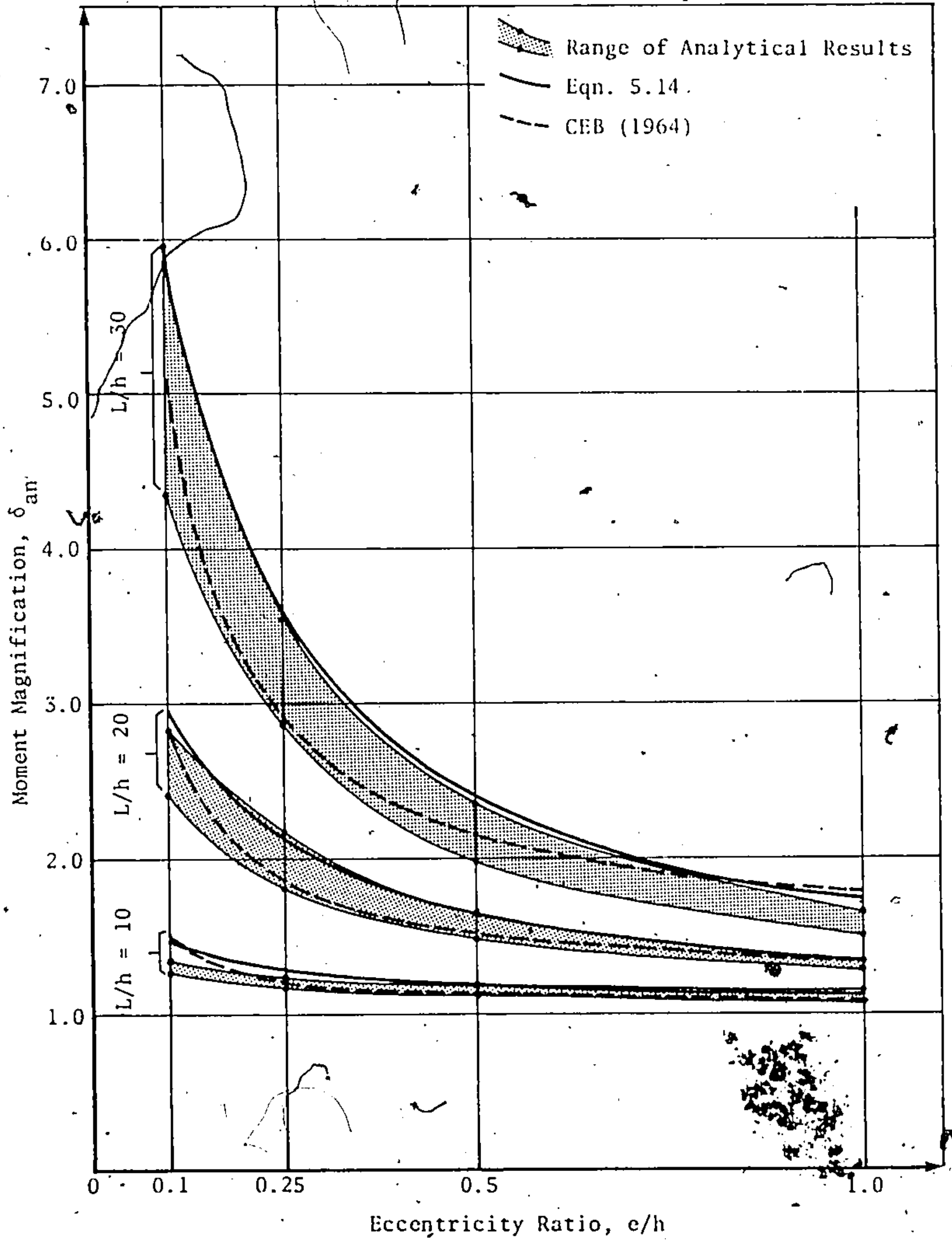

Fig. D.12 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.4

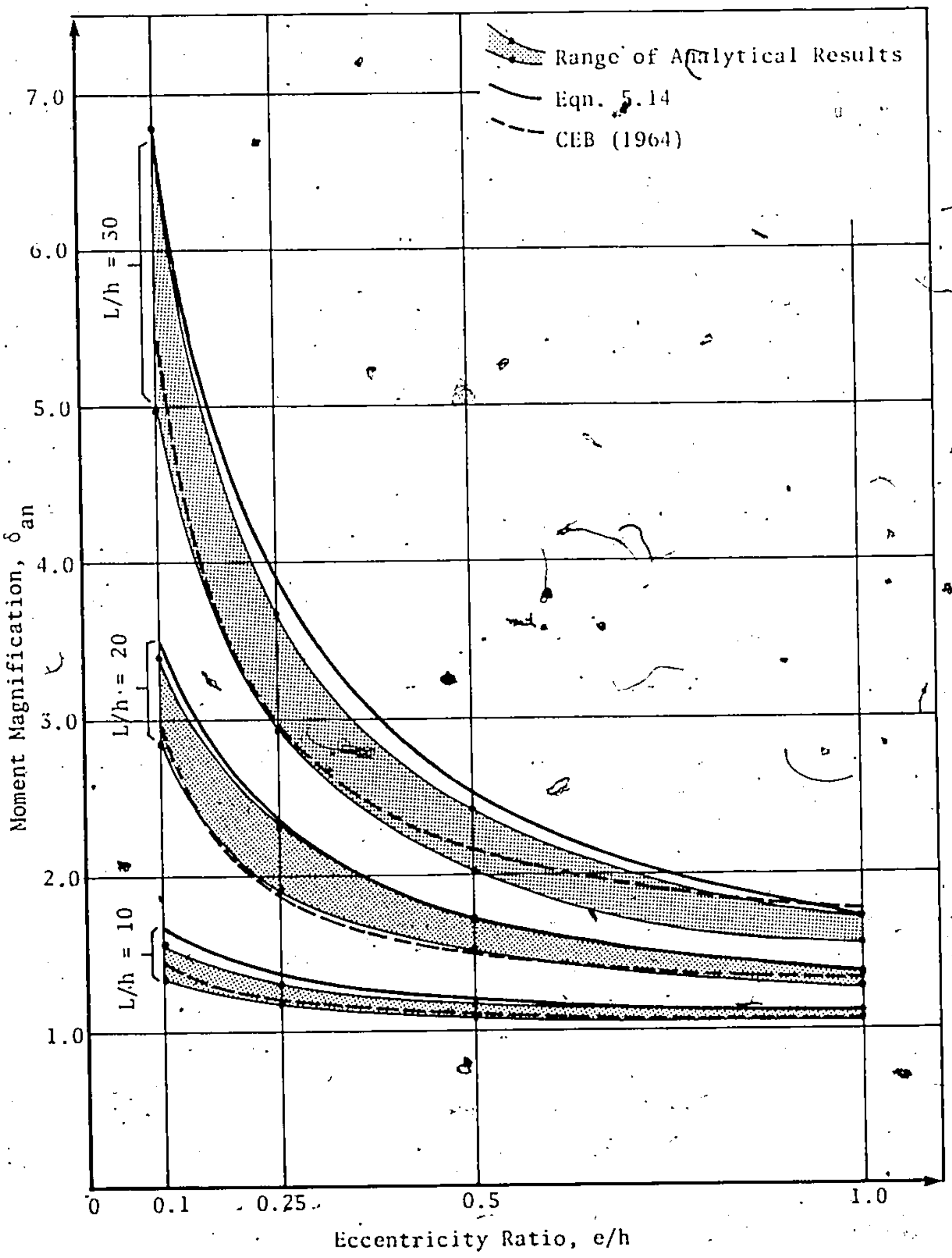

Fig. D.13 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.6

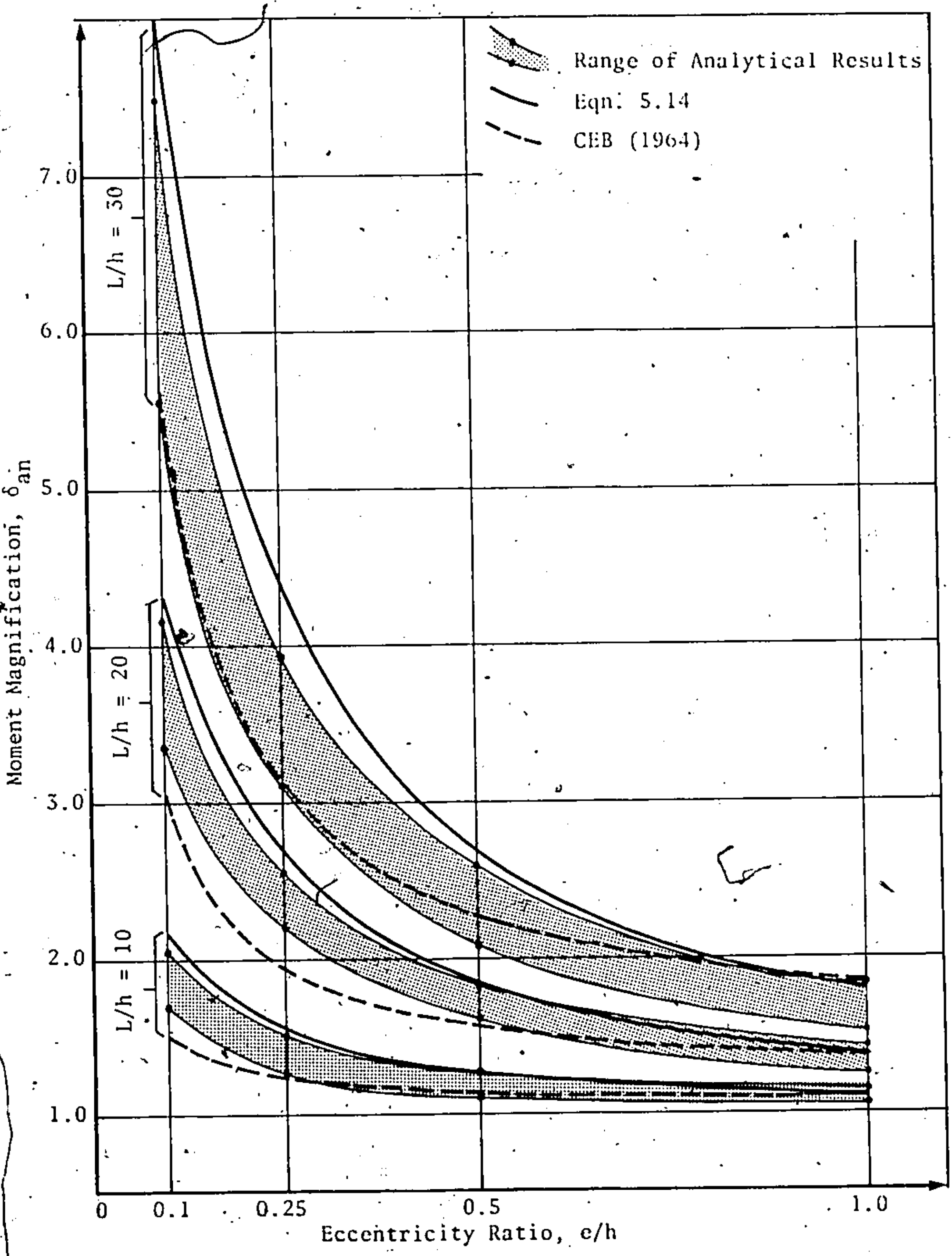

Fig. D.14 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 1.0, P_{sus}/P_{an} = 0.8

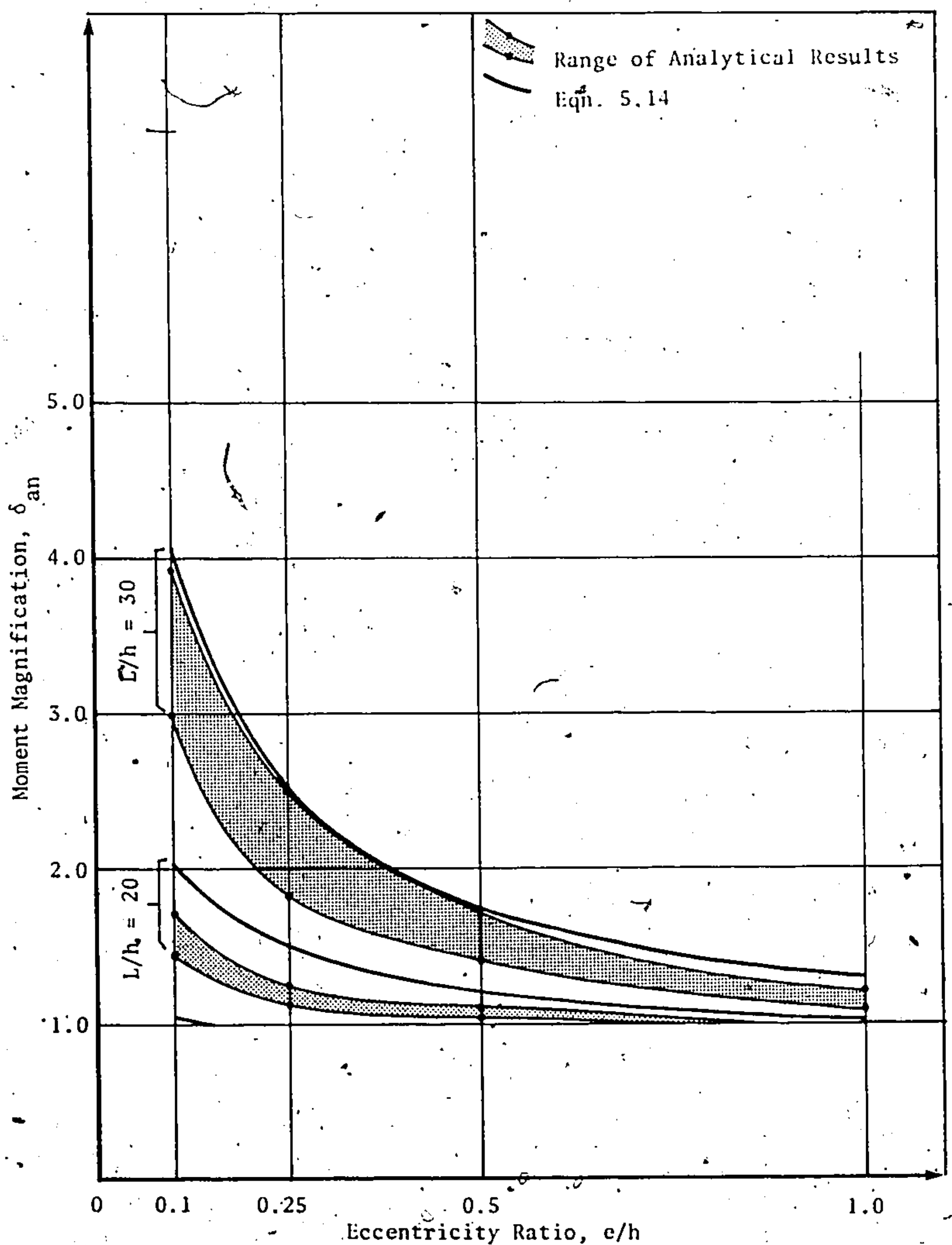

Fig. D.15 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 0.0, P_{sus}/P_{an} = 0.2

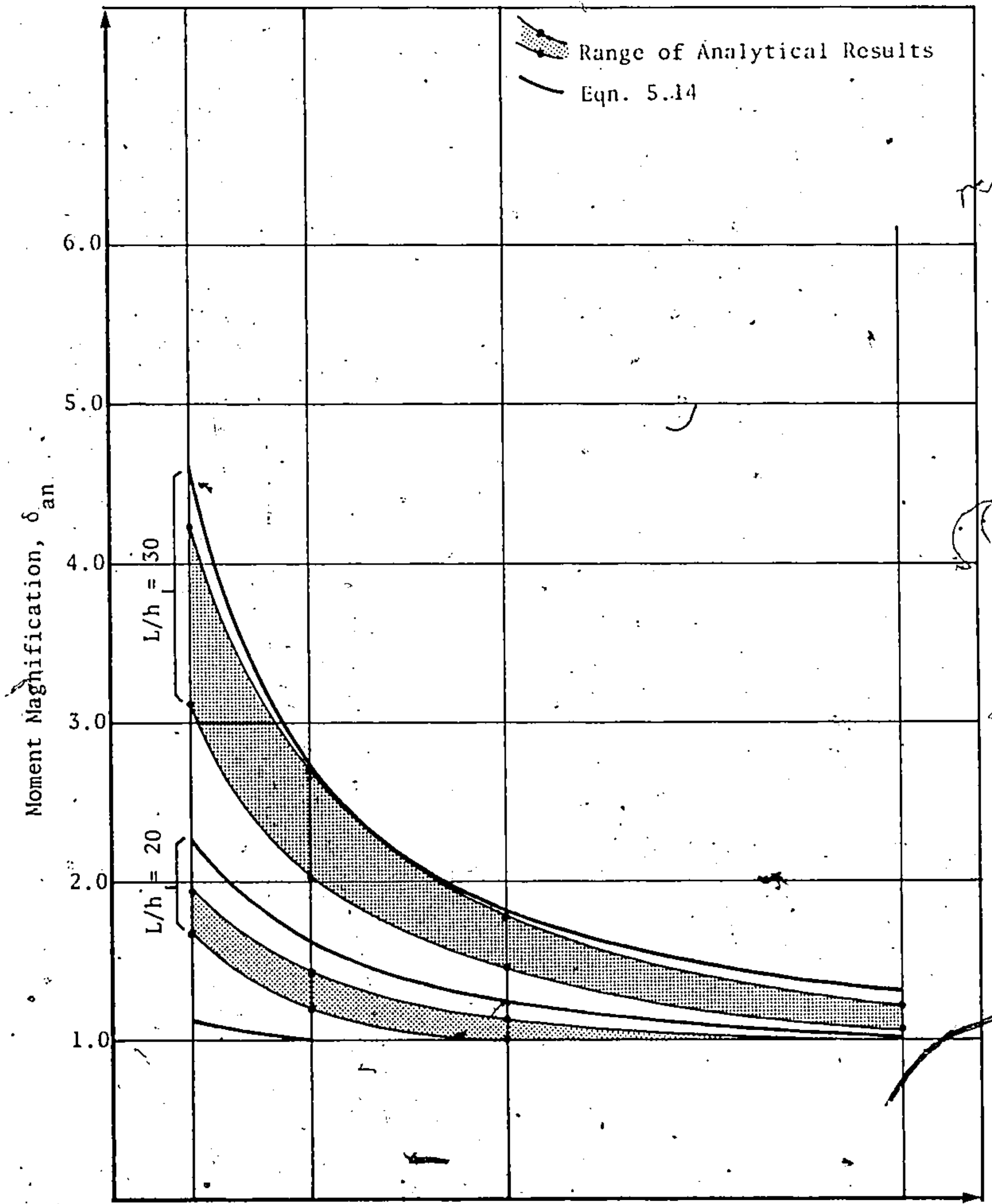

Fig. D.16 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 0.0, P_{sus}/P_{an} = 0.4

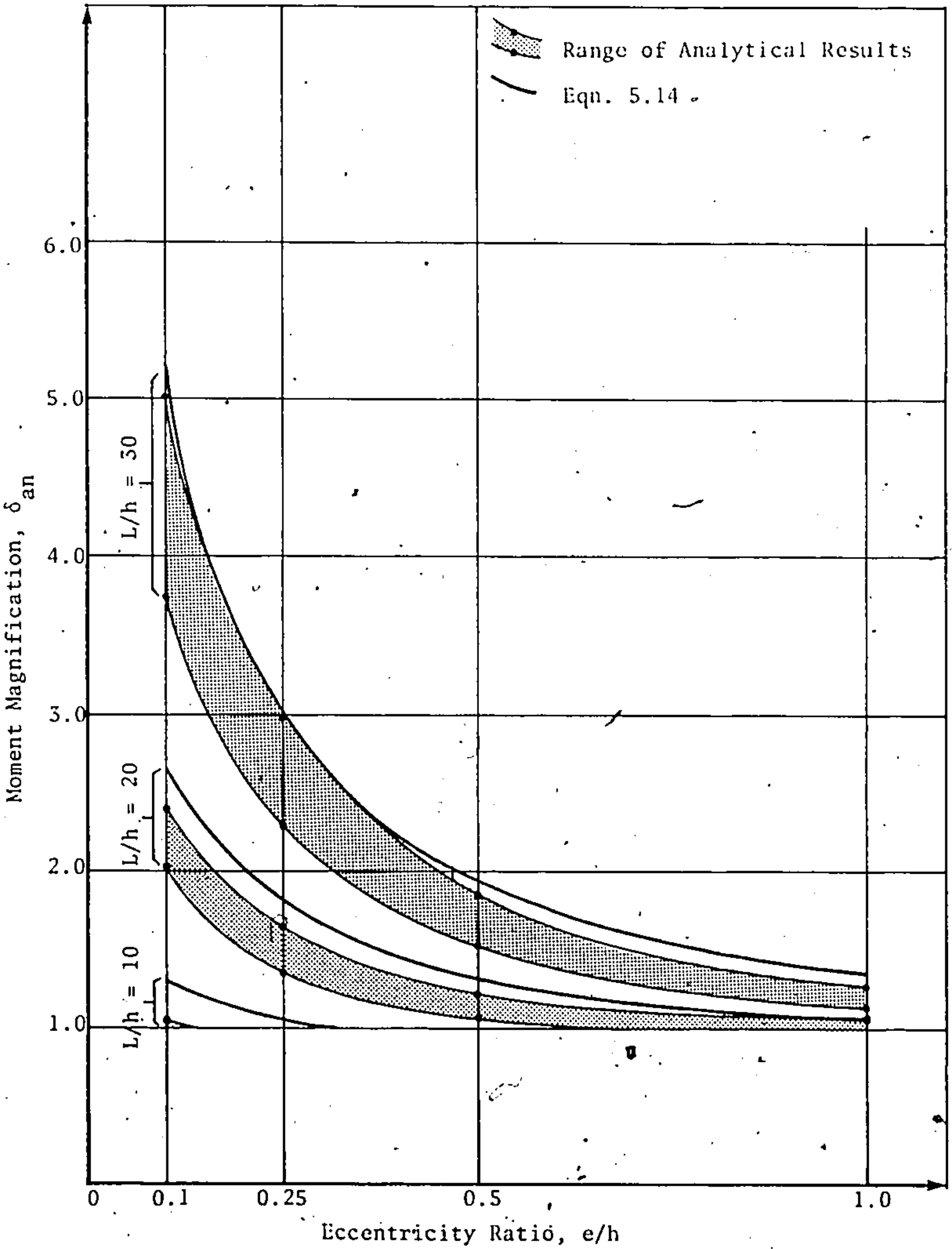

Fig. D.17 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 0.0,
P_{sus}/P_{an} = 0.6

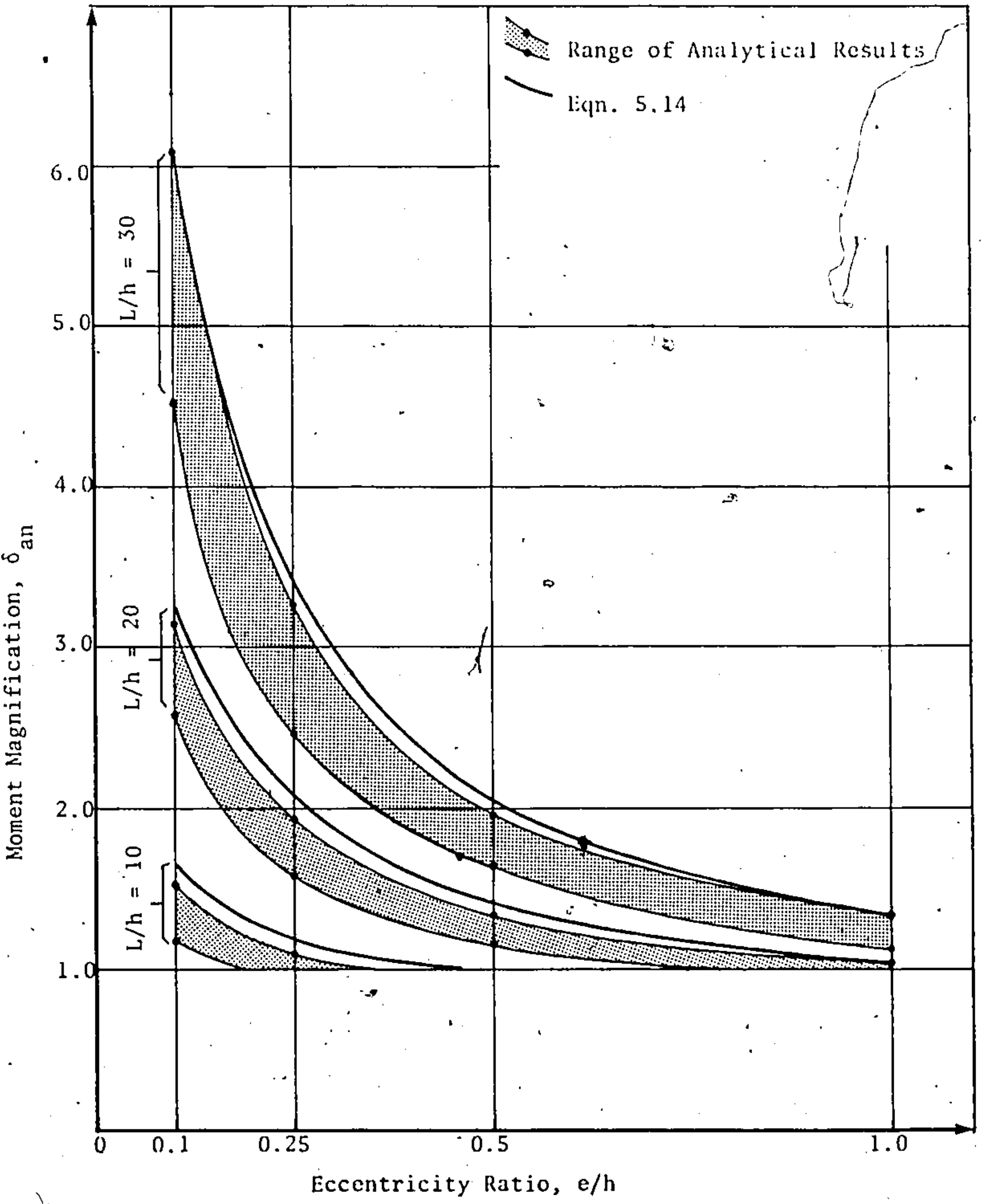

Fig. D.18 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = 0.0, P_{sus}/P_{an} = 0.8

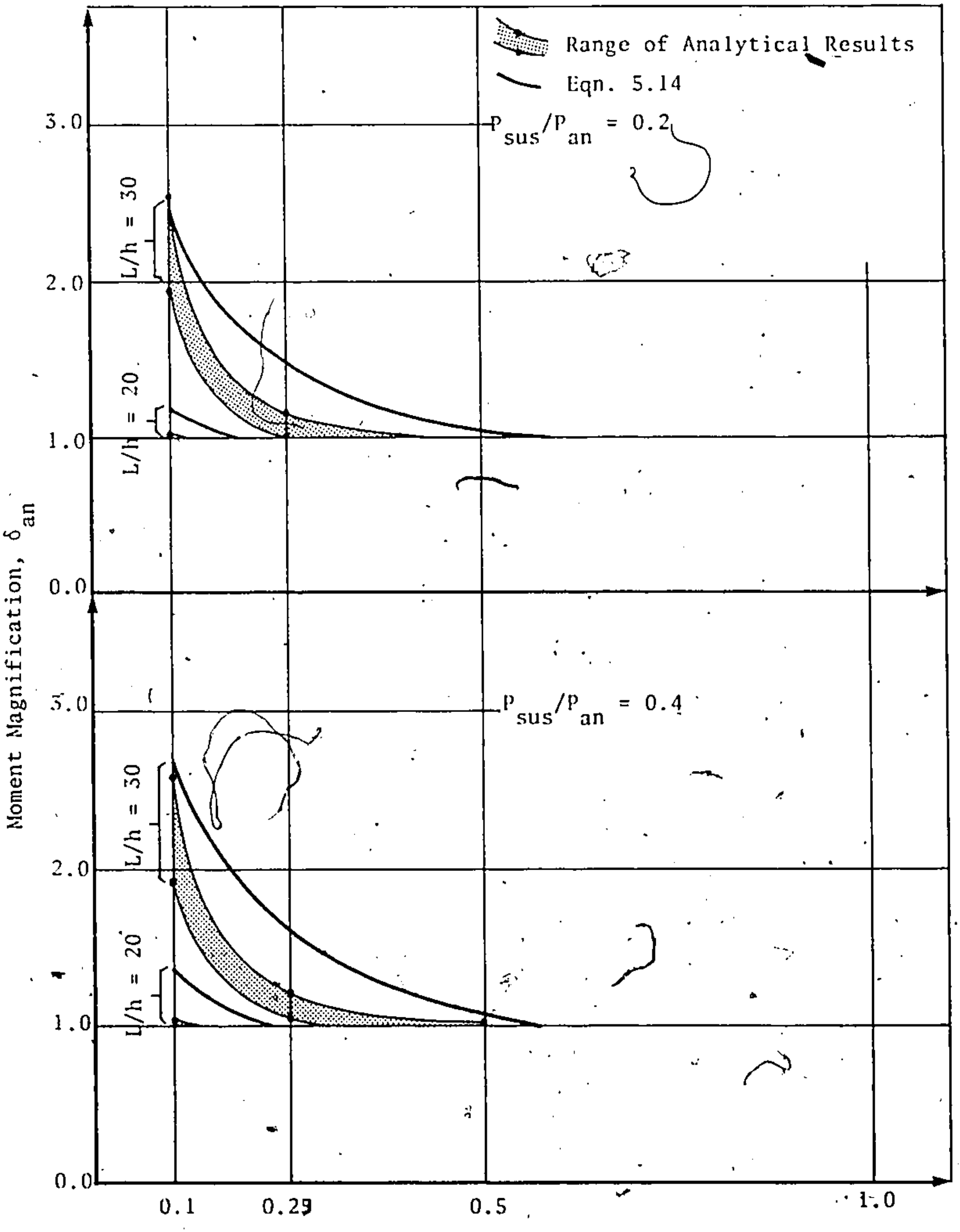

Fig. D.19 δ_{an} VERSUS e/h FOR f_y = 60 ksi, e_1/e_2 = -0.98, P_{sus}/P_{an} = 0.2 & 0.4

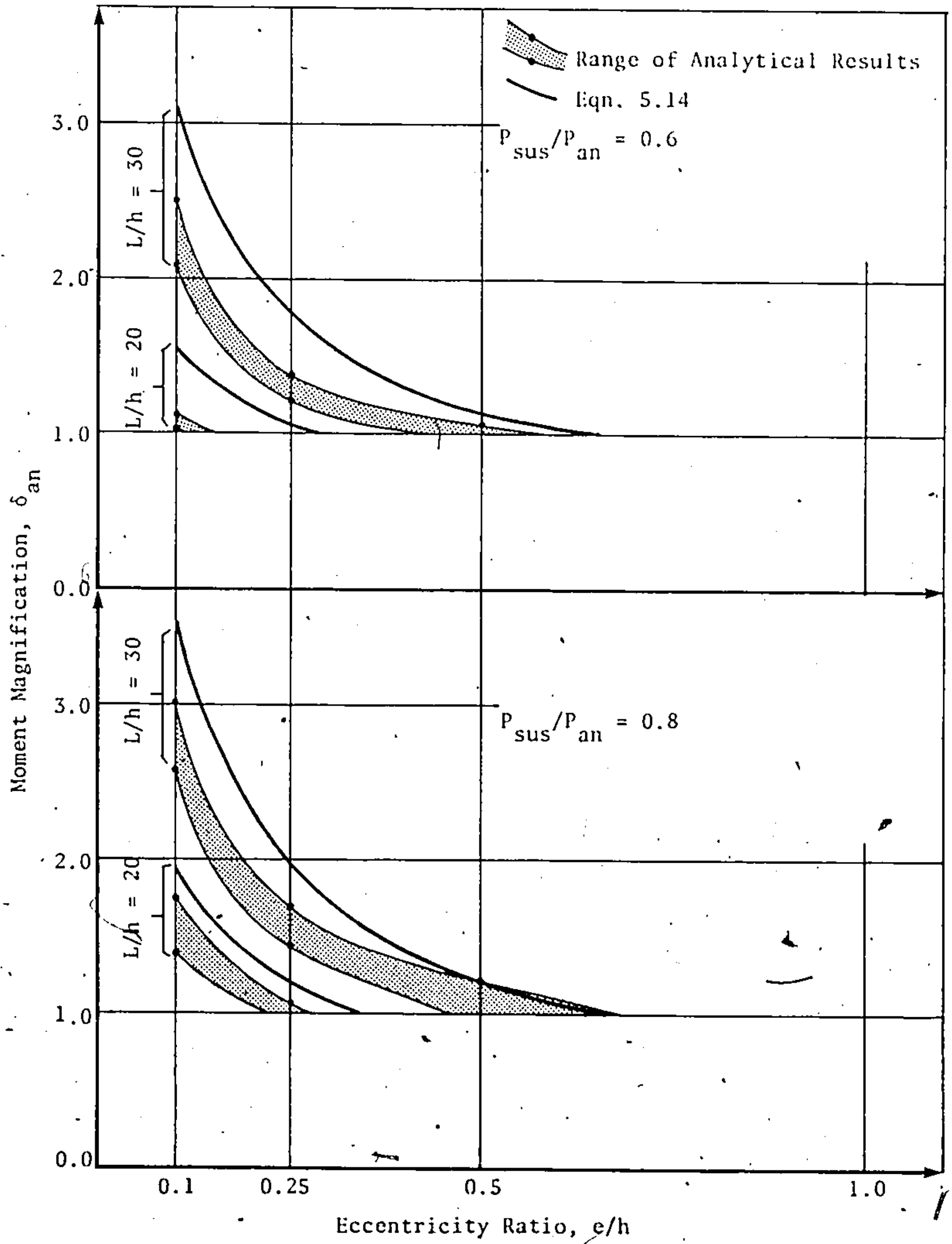

Fig. D.20 δ_{an} VERSUS e/h FOR $f_y = 60$ ksi, $e_1/e_2 = -0.98$, $P_{sus}/P_{an} = 0.6$ & 0.8

APPENDIX E

COLUMN CAPACITIES AND ASSOCIATED ERRORS OF THE PROPOSED METHOD

3

Tables E1 to E24 give values of column capacities predicted by the proposed method, P_{GR}, using values of $\delta_{an\ max.}$ and the ACI Rectangular Stress Block. These capacities include the capacity reduction factor. Refer to Section 5.8 for a discussion on these tables. Errors were calculated by comparing these predicted capacities with those of the analytical method (Appendix C) by using Eqn. 5.4.

The following notation is used in the tables:

P_{GR}	column capacity (kips) predicted by the proposed method (P$_{gr}$ in text)
ERR	Error, as a percentage, calculated by Eqn. 5.4
P_S/P_{AN}	ratio of sustained load to ultimate load (P_{sus}/P_{an} in text)
E/H	ratio of eccentricity to section depth (e/h in text)
E_1/E_2	ratio of end eccentricities (e_1/e_2 in text)
L/H	ratio of column length to section depth (L/h in text)

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 1

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	213.5	-5.	.30	213.5	-5.	.40	213.5	-5.	.50	213.5	-6.	.60	202.1	-5.	.70	202.1	-11.	.78	174.6	-3.
		0.25	139.4	-6.	.30	139.4	-6.	.40	139.4	-6.	.50	139.4	-6.	.59	134.5	-5.	.76	115.1	-0.	.79	115.1	-3.
		0.5	63.9	2.	.31	62.4	2.	.43	62.4	-1.	.51	59.9	2.	.62	59.9	-2.	.69	59.9	-3.	.80	53.0	5.
		1.0	20.9	3.	.29	20.9	2.	.40	20.2	4.	.51	20.2	3.	.60	20.2	1.	.70	20.2	1.	.81	19.6	3.
	0.0	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	232.7	-5.	.60	232.7	-5.	.68	232.7	-8.	.79	205.2	-4.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.73	153.5	-2.	.78	153.5	-3.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
	-0.98	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	232.7	-5.	.60	232.7	-5.	.70	232.7	-5.	.80	232.7	-5.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.70	159.3	-6.	.80	159.3	-6.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
20.	1.0	0.1	164.8	-4.	.32	146.9	-1.	.41	146.9	-6.	.52	127.4	0.	.66	127.4	-10.	.70	127.4	-14.	.83	104.6	-6.
		0.25	87.7	5.	.31	82.3	2.	.43	82.3	-3.	.55	72.3	4.	.61	72.3	-0.	.69	72.3	-6.	.79	54.9	13.
		0.5	39.9	10.	.33	38.7	6.	.41	38.7	3.	.52	35.9	7.	.64	35.9	3.	.69	35.9	0.	.79	30.6	13.
		1.0	17.4	7.	.30	17.4	2.	.41	17.0	1.	.50	17.0	0.	.61	16.5	1.	.70	16.5	0.	.80	15.9	2.
	0.0	0.1	196.8	-5.	.31	183.8	-0.	.42	183.8	-6.	.47	183.8	-10.	.58	159.1	-3.	.70	130.6	5.	.81	130.6	-6.
		0.25	138.2	-3.	.33	125.3	-2.	.42	125.3	-6.	.51	108.8	3.	.61	108.8	-4.	.70	91.2	7.	.80	91.2	-1.
		0.5	74.7	3.	.32	69.8	2.	.41	69.8	-1.	.50	69.8	-4.	.61	63.3	0.	.70	51.0	16.	.81	51.0	10.
		1.0	25.0	-2.	.30	25.0	-2.	.40	24.4	0.	.50	24.4	0.	.61	24.0	1.	.71	23.7	1.	.80	23.7	0.
	-0.98	0.1	231.2	-5.	.30	231.2	-5.	.40	231.2	-5.	.50	231.2	-5.	.60	223.0	-4.	.68	223.0	-10.	.81	190.4	-6.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.70	159.3	-6.	.81	148.8	-6.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
30.	1.0	0.1	95.4	11.	.31	73.1	18.	.40	73.1	11.	.53	58.2	21.	.53	58.2	14.	.69	58.2	10.	.83	49.2	15.
		0.25	42.4	23.	.33	38.4	19.	.43	38.4	15.	.55	35.1	17.	.67	35.1	13.	.71	30.9	22.	.80	30.9	18.
		0.5	26.6	13.	.31	24.6	9.	.42	24.6	7.	.51	22.9	10.	.63	22.9	7.	.71	20.8	13.	.80	20.8	10.
		1.0	13.9	10.	.32	13.7	4.	.39	13.7	2.	.51	13.2	4.	.59	13.2	2.	.71	12.7	2.	.80	12.7	0.
	0.0	0.1	139.8	-3.	.28	139.8	-12.	.41	119.0	-5.	.51	91.2	12.	.59	91.2	6.	.72	65.1	23.	.83	65.1	14.
		0.25	70.5	20.	.32	59.1	18.	.38	59.1	14.	.50	59.1	8.	.61	51.6	14.	.71	43.7	23.	.79	43.7	18.
		0.5	43.4	16.	.29	43.4	5.	.39	37.0	15.	.51	34.4	17.	.61	34.4	13.	.70	34.4	9.	.79	29.9	17.
		1.0	21.3	8.	.32	21.3	2.	.40	21.3	1.	.50	21.3	-1.	.60	20.4	0.	.69	20.4	-1.	.80	18.9	4.
	-0.98	0.1	182.7	-4.	.30	182.7	-4.	.40	178.2	-2.	.51	160.9	4.	.61	160.9	-2.	.69	160.9	-9.	.80	130.9	1.
		0.25	153.6	-6.	.31	142.5	-2.	.41	142.5	-6.	.51	126.4	1.	.62	126.4	-7.	.70	99.6	9.	.81	93.6	0.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.63	77.4	-3.	.72	63.1	12.	.80	63.1	3.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 2

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P_S	P_{GR}	ERR	P_S/P_S	P_{GR}	ERR	P_S/P_S	P_{GR}	ERR	P_S/P_S	P_{GR}	ERR	P_S/P_S	P_{GR}	ERR	P_S/P_S	P_{GR}	ERR
10.	1.0	0.1	335.9	-5.	.30	335.9	-5.	.40	335.9	-5.	.50	335.9	-5.	.60	317.1	-1.	.70	317.1	-5.	.82	270.6	3.
		0.25	209.8	-4.	.30	209.8	-4.	.40	209.8	-4.	.50	209.8	-5.	.61	261.3	-4.	.71	163.7	10.	.80	163.7	5.
		0.5	77.5	1.	.31	75.4	0.	.41	75.4	-1.	.51	71.8	2.	.61	71.8	-0.	.70	71.8	-3.	.80	62.7	8.
		1.0	23.4	0.	.31	22.6	1.	.40	22.6	-0.	.51	22.6	-2.	.61	22.6	-2.	.72	21.9	0.	.79	21.9	-1.
	0.0	0.1	367.4	-5.	.30	367.4	-5.	.40	367.4	-5.	.50	367.4	-5.	.60	367.3	-5.	.69	367.3	-5.	.81	322.3	2.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	244.2	-5.	.80	234.3	-1.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
	-0.98	0.1	367.4	-5.	.30	367.4	-5.	.40	367.4	-5.	.50	367.4	-5.	.50	367.4	-5.	.70	367.4	-5.	.80	367.4	-5.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	244.2	-5.	.80	244.2	-5.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
20.	1.0	0.1	253.7	-3.	.31	222.9	6.	.41	222.9	[illegible]	.51	188.8	11.	.63	188.8	4.	.70	188.8	-2.	.80	145.2	15.
		0.25	116.0	11.	.32	106.8	9.	.43	106.8	5.	.54	89.9	16.	.67	89.9	10.	.71	65.3	33.	.80	65.3	28.
		0.5	45.9	13.	.32	44.4	7.	.41	44.4	5.	.51	41.0	9.	.62	41.0	6.	.69	41.0	4.	.78	34.6	17.
		1.0	19.4	3.	.30	18.9	1.	.40	18.9	-1.	.50	18.9	-2.	.61	18.4	-2.	.68	18.4	-2.	.81	17.7	-1.
	0.0	0.1	308.3	-5.	.30	308.3	-5.	.40	286.3	-0.	.50	244.0	10.	.62	244.0	3.	.70	244.0	-4.	.80	194.6	9.
		0.25	207.7	-1.	.30	184.1	5.	.42	184.1	0.	.49	184.1	-3.	.60	152.6	9.	.70	122.0	22.	.79	122.0	16.
		0.5	93.8	4.	.31	85.9	6.	.41	85.9	4.	.50	76.7	11.	.60	76.7	8.	.70	76.7	4.	.80	63.0	22.
		1.0	28.1	-1.	.30	28.1	-2.	.40	27.4	-1.	.52	27.0	0.	.62	27.0	-1.	.70	27.0	-2.	.80	26.6	-1.
	-0.98	0.1	364.9	-5.	.30	364.9	-5.	.40	364.9	-5.	.50	364.9	-5.	.59	351.6	-1.	.73	297.5	10.	.81	297.5	4.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	244.2	-5.	.80	226.2	3.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
30.	1.0	0.1	129.2	22.	.31	91.2	38.	.40	91.2	33.	.51	69.6	44.	.61	69.6	40.	.71	57.7	46.	.79	57.7	42.
		0.25	49.0	32.	.31	44.0	27.	.42	44.0	24.	.53	40.1	28.	.64	40.1	24.	.70	40.1	22.	.79	35.0	29.
		0.5	30.0	15.	.32	27.6	11.	.42	27.6	8.	.51	25.7	13.	.63	25.7	10.	.71	23.2	16.	.80	23.2	14.
		1.0	15.5	7.	.31	15.2	0.	.43	15.2	-1.	.51	14.6	1.	.60	14.6	-1.	.70	14.1	1.	.80	14.1	-1.
	0.0	0.1	210.6	0.	.30	210.6	-5.	.42	170.6	8.	.51	121.9	30.	.61	121.9	24.	.72	79.2	46.	.81	79.2	41.
		0.25	87.0	35.	.31	70.8	37.	.40	70.8	33.	.50	60.8	38.	.60	60.8	34.	.71	50.7	41.	.80	50.7	37.
		0.5	50.2	24.	.32	42.3	24.	.42	42.3	21.	.50	42.3	19.	.60	39.2	22.	.70	39.2	18.	.81	33.8	26.
		1.0	23.8	6.	.32	23.8	-0.	.40	23.8	-1.	.50	23.8	-3.	.59	22.9	-1.	.70	22.9	-3.	.80	21.1	3.
	-0.98	0.1	284.5	-5.	.30	284.5	-5.	.40	276.7	-2.	.49	276.7	-2.	.60	247.0	7.	.69	247.0	0.	.81	195.1	13.
		0.25	234.5	-5.	.30	215.2	3.	.40	215.2	0.	.50	185.6	10.	.60	186.6	5.	.71	136.5	25.	.80	136.5	19.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.62	98.3	2.	.71	76.4	21.	.80	76.4	17.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 3

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	218.6	-5.	.30	218.6	-5.	.40	218.6	-5.	.50	208.1	-0.	.60	208.1	-4.	.69	208.1	-8.	.80	182.9	-4.
		0.25	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.59	145.5	-2.	.72	125.8	5.	.79	125.3	1.
		0.5	75.2	3.	.31	73.7	3.	.41	73.7	2.	.51	71.1	3.	.61	71.1	1.	.69	71.1	-1.	.79	64.1	6.
		1.0	24.9	6.	.30	24.9	6.	.40	24.0	9.	.50	24.0	9.	.61	24.0	9.	.69	24.0	9.	.81	23.2	11.
	0.0	0.1	236.3	-5.	.30	236.3	-5.	.40	236.3	-5.	.50	236.3	-5.	.60	236.2	-5.	.72	211.0	1.	.80	211.0	-4.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.8	-5.	.70	168.8	-5.	.80	163.4	-2.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
	-0.98	0.1	236.3	-5.	.30	236.3	-5.	.40	236.3	-5.	.50	236.3	-5.	.60	236.3	-5.	.70	236.3	-5.	.80	236.3	-5.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.8	-5.	.70	168.8	-5.	.80	168.8	-5.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
20.	1.0	0.1	173.9	-4.	.30	157.3	1.	.40	157.3	-3.	.51	138.7	3.	.62	138.7	-4.	.71	115.5	6.	.79	115.5	0.
		0.25	98.9	8.	.30	98.9	2.	.40	93.5	5.	.52	83.4	9.	.55	83.4	2.	.70	83.4	-2.	.80	66.1	13.
		0.5	49.1	14.	.31	47.6	9.	.42	47.6	7.	.53	44.2	11.	.53	44.2	7.	.70	44.2	5.	.80	37.5	16.
		1.0	20.4	10.	.30	20.4	10.	.40	19.8	12.	.49	19.8	11.	.59	19.2	13.	.71	18.5	14.	.80	18.5	13.
	0.0	0.1	203.3	-5.	.31	191.3	-1.	.41	191.3	-5.	.51	168.6	2.	.62	168.6	-7.	.72	141.8	2.	.81	141.8	-6.
		0.25	149.0	-2.	.29	149.0	-6.	.40	136.7	-2.	.50	136.7	-6.	.62	119.7	0.	.71	102.4	9.	.80	102.4	2.
		0.5	85.9	3.	.29	85.9	1.	.39	80.9	4.	.50	80.9	1.	.61	74.6	4.	.71	61.8	15.	.80	61.8	11.
		1.0	30.2	0.	.30	30.2	0.	.40	29.5	2.	.50	29.5	2.	.60	29.0	4.	.70	29.0	4.	.80	28.6	5.
	-0.98	0.1	234.9	-4.	.30	234.9	-4.	.40	234.9	-4.	.50	234.9	-4.	.61	227.4	-5.	.69	227.4	-10.	.80	197.4	-5.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.8	-5.	.70	168.8	-5.	.80	159.1	-3.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
30.	1.0	0.1	106.6	13.	.33	84.3	17.	.45	84.3	10.	.51	69.5	24.	.58	69.5	19.	.73	59.9	22.	.79	59.9	18.
		0.25	52.0	27.	.32	47.3	24.	.43	47.3	21.	.55	43.2	24.	.61	43.2	21.	.69	43.2	18.	.80	37.9	22.
		0.5	32.4	18.	.31	29.7	20.	.41	29.7	16.	.52	27.5	20.	.54	27.5	17.	.69	27.5	15.	.79	24.7	20.
		1.0	16.0	16.	.30	16.0	14.	.40	15.8	13.	.49	15.8	13.	.58	15.1	16.	.71	14.5	17.	.80	14.5	16.
	0.0	0.1	150.6	-2.	.28	150.6	-12.	.42	129.6	-5.	.51	102.3	11.	.61	102.3	3.	.69	102.3	-4.	.78	76.4	16.
		0.25	81.6	22.	.27	81.6	11.	.42	70.4	16.	.50	62.5	22.	.61	62.5	18.	.72	53.7	24.	.80	53.7	19.
		0.5	53.2	20.	.28	53.2	11.	.40	45.5	20.	.50	42.3	22.	.61	42.3	19.	.71	36.6	25.	.82	36.6	20.
		1.0	25.4	12.	.28	25.4	11.	.39	25.4	9.	.49	25.4	8.	.60	24.3	11.	.69	24.3	9.	.79	22.3	15.
	-0.98	0.1	190.3	-2.	.31	186.2	-2.	.42	186.2	-5.	.51	170.3	1.	.61	170.3	-4.	.69	170.3	-12.	.81	142.1	-4.
		0.25	163.5	-5.	.31	153.1	-0.	.41	153.1	-4.	.50	137.8	3.	.61	137.8	-4.	.73	110.7	8.	.80	110.7	2.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	88.6	2.	.73	74.4	12.	.81	74.4	7.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 4

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	341.0	-5.	.30	341.0	-5.	.40	341.0	-5.	.50	341.0	-5.	.61	323.3	-0.	.69	323.3	-4.	.82	280.1	4.
		0.25	223.6	-4.	.30	223.6	-4.	.40	223.6	-4.	.50	223.6	-4.	.61	215.6	-3.	.70	176.8	12.	.81	176.8	6.
		0.5	91.6	2.	.30	89.3	2.	.41	89.3	1.	.50	85.3	4.	.60	85.3	2.	.70	85.3	-0.	.80	74.8	10.
		1.0	25.8	7.	.30	25.8	7.	.40	24.8	10.	.51	24.8	10.	.60	24.8	10.	.71	23.9	12.	.80	23.9	12.
	0.0	0.1	370.8	-5.	.30	370.8	-5.	.40	370.8	-5.	.50	370.8	-5.	.60	370.7	-5.	.69	370.7	-5.	.80	328.2	3.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	246.4	-1.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
	-0.98	0.1	370.8	-5.	.30	370.8	-5.	.40	370.8	-5.	.50	370.8	-5.	.60	370.8	-5.	.70	370.8	-5.	.80	370.8	-5.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	255.7	-5.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
20.	1.0	0.1	264.5	-3.	.29	264.5	-6.	.39	235.8	2.	.48	235.8	-2.	.62	201.1	6.	.70	201.1	-0.	.80	158.8	15.
		0.25	130.1	14.	.30	130.1	7.	.41	121.0	10.	.51	104.5	19.	.60	104.5	16.	.70	77.8	34.	.80	77.8	29.
		0.5	54.4	16.	.29	54.4	12.	.39	52.4	13.	.49	52.4	10.	.50	48.1	15.	.70	46.1	13.	.80	39.8	25.
		1.0	21.1	12.	.30	21.1	10.	.41	20.5	12.	.51	19.8	15.	.61	19.8	14.	.70	19.0	10.	.79	19.0	16.
	0.0	0.1	315.2	-5.	.30	315.2	-5.	.40	294.7	-0.	.50	255.5	9.	.62	255.5	2.	.70	255.5	-4.	.81	208.1	6.
		0.25	221.6	-1.	.31	196.5	7.	.41	196.5	4.	.50	196.5	0.	.60	166.0	11.	.72	136.0	22.	.81	136.0	16.
		0.5	108.4	5.	.31	100.5	9.	.40	100.5	7.	.50	100.5	4.	.50	90.7	11.	.71	71.6	26.	.80	71.6	23.
		1.0	31.5	1.	.30	31.5	1.	.40	30.7	3.	.50	30.7	3.	.60	30.2	5.	.70	30.2	5.	.80	29.7	6.
	-0.98	0.1	368.5	-5.	.30	368.5	-5.	.40	368.5	-5.	.50	368.5	-5.	.59	355.8	-1.	.73	305.1	9.	.80	305.1	4.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	236.9	2.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
30.	1.0	0.1	143.2	20.	.29	143.2	11.	.37	105.9	31.	.47	105.9	26.	.59	82.8	38.	.74	68.9	42.	.81	68.9	39.
		0.25	58.2	36.	.30	58.2	28.	.39	52.0	33.	.50	52.0	30.	.61	47.0	34.	.70	40.4	41.	.80	40.4	33.
		0.5	33.9	24.	.30	30.9	25.	.40	30.9	23.	.49	30.9	22.	.51	28.5	26.	.72	25.6	31.	.81	25.6	29.
		1.0	16.5	19.	.31	16.2	16.	.40	16.2	16.	.51	15.5	18.	.50	15.5	17.	.70	14.9	19.	.81	14.9	13.
	0.0	0.1	224.4	-1.	.33	183.5	11.	.42	183.5	6.	.51	135.9	27.	.59	135.9	22.	.73	93.4	41.	.80	93.4	37.
		0.25	101.6	33.	.28	101.6	24.	.39	84.2	33.	.50	84.2	29.	.61	72.6	35.	.72	60.3	42.	.80	60.3	39.
		0.5	59.8	28.	.29	59.8	19.	.40	49.8	30.	.49	49.8	28.	.60	45.8	31.	.71	36.8	38.	.81	38.8	35.
		1.0	26.3	12.	.30	26.3	12.	.39	26.3	11.	.49	25.3	10.	.59	25.1	13.	.69	25.1	13.	.80	23.0	19.
	-0.98	0.1	293.0	-4.	.30	293.0	-4.	.40	285.8	-1.	.51	258.3	7.	.61	258.3	4.	.70	258.3	-2.	.82	248.8	8.
		0.25	246.6	-4.	.30	246.6	-4.	.40	228.7	1.	.50	228.7	-3.	.61	199.0	6.	.70	199.0	0.	.79	150.3	19.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	112.9	4.	.71	90.4	21.	.80	90.4	17.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 5

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	EPR
10.	1.0	0.1	253.8	-4.	.30	253.8	-4.	.40	253.8	-4.	.50	253.8	-5.	.60	241.2	-3.	.71	211.5	4.	.79	211.5	-2.
		0.25	174.5	-4.	.30	174.5	-4.	.40	174.5	-4.	.49	174.5	-4.	.61	169.3	-3.	.70	150.3	7.	.82	150.3	-3.
		0.5	109.5	-0.	.30	109.5	-0.	.40	107.9	1.	.51	105.1	3.	.60	105.1	1.	.74	97.3	2.	.78	97.3	-0.
		1.0	44.8	7.	.30	44.8	7.	.40	43.3	10.	.51	43.3	9.	.60	43.3	8.	.70	43.3	7.	.79	42.0	9.
	0.0	0.1	275.6	-4.	.30	275.6	-4.	.40	275.6	-4.	.50	275.6	-4.	.60	275.5	-4.	.69	275.5	-8.	.80	244.7	-4.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	195.4	-5.	.70	195.4	-5.	.79	189.4	-3.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
	-0.98	0.1	275.6	-4.	.30	275.6	-4.	.40	275.6	-4.	.50	275.6	-4.	.60	275.6	-4.	.70	275.6	-4.	.80	275.6	-4.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	195.4	-5.	.70	195.4	-5.	.80	195.4	-5.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
20.	1.0	0.1	201.2	-2.	.31	182.5	0.	.42	182.5	-4.	.52	161.8	3.	.61	161.8	-2.	.70	161.8	-9.	.80	142.2	-3.
		0.25	129.7	-1.	.30	129.7	-5.	.40	125.7	-4.	.50	125.7	-7.	.61	118.0	-4.	.72	99.6	-5.	.81	99.6	-2.
		0.5	79.6	4.	.31	77.6	3.	.41	77.6	1.	.53	73.2	2.	.60	73.2	-0.	.70	73.2	-5.	.80	63.9	3.
		1.0	37.5	7.	.30	37.5	6.	.41	36.6	7.	.51	35.5	8.	.59	35.5	7.	.69	35.5	5.	.81	34.3	6.
	0.0	0.1	235.5	-3.	.31	221.4	-1.	.41	221.4	-4.	.50	221.4	-9.	.63	195.2	-5.	.73	165.2	4.	.80	165.2	-3.
		0.25	173.2	-2.	.31	159.6	1.	.41	159.6	-2.	.48	159.6	-4.	.61	145.4	-1.	.72	132.3	1.	.80	132.3	-4.
		0.5	120.1	-4.	.30	120.1	-4.	.39	115.4	-1.	.49	115.4	-4.	.60	108.8	-2.	.73	94.8	4.	.80	94.9	-1.
		1.0	52.9	0.	.30	52.9	0.	.40	51.7	2.	.50	51.7	2.	.60	51.0	4.	.70	51.0	4.	.81	50.3	4.
	-0.98	0.1	273.9	-3.	.30	273.9	-3.	.40	273.9	-3.	.50	273.9	-3.	.62	264.6	-5.	.69	264.6	-10.	.80	228.5	-4.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	195.4	-5.	.70	195.4	-5.	.79	184.5	-2.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
30.	1.0	0.1	135.4	0.	.31	118.8	2.	.44	118.8	-7.	.56	103.3	1.	.60	103.3	-1.	.69	103.3	-6.	.82	92.6	-3.
		0.25	83.2	7.	.32	77.2	6.	.43	77.2	2.	.54	72.0	5.	.61	72.0	3.	.70	64.5	9.	.82	64.5	2.
		0.5	56.2	5.	.31	52.1	7.	.42	52.1	4.	.53	48.7	7.	.60	48.7	5.	.69	48.7	2.	.82	44.4	5.
		1.0	30.2	8.	.30	30.2	6.	.40	29.7	6.	.51	28.6	6.	.60	28.6	5.	.69	28.6	3.	.81	27.5	4.
	0.0	0.1	175.0	-3.	.30	175.0	-11.	.43	153.4	-7.	.50	153.4	-13.	.60	132.2	-5.	.71	110.7	5.	.81	110.7	-3.
		0.25	116.1	4.	.30	116.1	-7.	.40	104.3	-1.	.50	104.3	-6.	.59	95.5	-1.	.71	85.2	5.	.81	85.2	-1.
		0.5	84.6	2.	.33	75.0	6.	.41	75.0	4.	.50	75.0	1.	.60	76.7	3.	.71	62.5	9.	.80	62.5	4.
		1.0	45.4	8.	.31	45.4	5.	.40	45.4	3.	.50	45.4	1.	.60	43.8	3.	.69	43.8	0.	.81	40.6	3.
	-0.98	0.1	220.2	-1.	.30	215.4	1.	.42	215.4	-3.	.50	215.4	-6.	.61	197.1	-2.	.69	197.1	-9.	.78	165.5	-0.
		0.25	189.5	-4.	.31	177.8	-2.	.41	177.8	-5.	.50	177.8	-8.	.62	160.8	-4.	.72	139.5	4.	.80	138.5	-5.
		0.5	124.6	-4.	.30	124.6	-4.	.40	124.6	-4.	.50	124.6	-4.	.60	122.1	-2.	.68	122.1	-5.	.81	108.6	-2.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 6

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	374.4	-4.	.30	374.4	-4.	.40	374.4	-4.	.50	374.4	-4.	.60	354.5	-1.	.70	307.2	9.	.81	307.2	4.
		0.25	247.8	-3.	.30	247.8	-3.	.40	247.8	-3.	.50	247.8	-3.	.59	239.6	-0.	.70	209.8	10.	.80	209.8	7.
		0.5	135.5	2.	.30	135.5	1.	.41	133.0	1.	.52	128.7	3.	.61	128.7	1.	.70	116.8	8.	.80	116.8	5.
		1.0	48.5	6.	.30	46.9	8.	.41	46.9	7.	.51	46.9	6.	.60	46.9	6.	.71	45.4	8.	.80	45.4	7.
	0.0	0.1	408.4	-4.	.30	408.4	-4.	.40	408.4	-4.	.50	408.4	-4.	.60	408.3	-4.	.69	408.3	-5.	.80	366.0	3.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	271.5	-1.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
	-0.98	0.1	408.4	-4.	.30	408.4	-4.	.40	408.4	-4.	.50	408.4	-4.	.60	408.4	-4.	.70	408.4	-4.	.80	408.4	-4.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	281.2	-5.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
20.	1.0	0.1	290.5	-2.	.31	260.5	3.	.42	260.5	-1.	.52	227.6	7.	.61	227.6	3.	.69	227.6	-3.	.80	197.3	4.
		0.25	174.4	0.	.31	165.6	1.	.41	165.6	-2.	.51	149.1	6.	.60	149.1	3.	.70	120.2	17.	.80	120.2	12.
		0.5	90.6	8.	.31	87.8	6.	.42	87.8	4.	.53	81.8	7.	.60	81.8	5.	.69	81.8	3.	.81	70.1	12.
		1.0	40.5	7.	.31	39.5	7.	.40	39.5	6.	.51	38.3	7.	.59	38.3	7.	.71	36.9	8.	.80	36.9	7.
	0.0	0.1	345.4	-4.	.30	322.9	2.	.41	322.9	-2.	.50	322.9	-6.	.61	281.0	2.	.72	233.0	12.	.81	233.0	6.
		0.25	245.7	-1.	.30	224.2	3.	.41	224.2	-0.	.50	224.2	-3.	.61	202.2	2.	.70	202.2	-2.	.79	180.1	4.
		0.5	153.1	1.	.32	144.9	3.	.40	144.9	1.	.50	144.9	-1.	.60	134.5	3.	.71	113.0	14.	.80	113.0	10.
		1.0	57.6	-0.	.30	57.6	-0.	.40	56.3	2.	.50	56.3	2.	.60	55.5	3.	.70	55.5	3.	.80	54.7	4.
	-0.98	0.1	405.8	-4.	.30	405.8	-4.	.40	405.8	-4.	.50	405.8	-4.	.60	391.3	-0.	.69	391.3	-5.	.80	334.3	4.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	263.7	2.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
30.	1.0	0.1	186.8	3.	.30	150.5	12.	.40	150.5	7.	.52	125.9	16.	.60	125.9	11.	.69	125.9	7.	.80	109.7	14.
		0.25	95.8	14.	.31	87.3	15.	.42	87.3	12.	.54	80.2	16.	.60	80.2	14.	.71	70.9	20.	.80	70.9	17.
		0.5	61.3	10.	.31	56.8	10.	.41	56.8	8.	.52	52.9	11.	.60	52.9	10.	.71	48.1	15.	.81	48.1	12.
		1.0	32.5	10.	.31	31.9	6.	.42	31.9	5.	.52	30.7	7.	.60	30.7	6.	.71	29.5	6.	.79	29.5	5.
	0.0	0.1	248.5	-2.	.30	248.5	-8.	.42	214.6	-1.	.50	180.0	11.	.60	180.0	5.	.71	137.4	21.	.81	137.4	15.
		0.25	146.1	10.	.31	127.4	12.	.40	127.4	8.	.49	127.4	3.	.60	114.1	9.	.69	114.1	6.	.81	96.7	13.
		0.5	97.9	9.	.30	84.2	15.	.41	84.2	12.	.51	78.6	15.	.59	78.6	12.	.70	68.6	20.	.79	68.6	16.
		1.0	49.2	9.	.30	49.2	5.	.40	49.2	4.	.49	49.2	3.	.60	47.4	4.	.69	47.4	2.	.81	43.9	7.
	-0.98	0.1	321.1	-3.	.30	321.1	-3.	.40	313.3	-0.	.50	313.3	-2.	.60	284.0	4.	.72	233.5	15.	.80	233.5	9.
		0.25	271.7	-4.	.31	253.0	1.	.40	253.0	-2.	.50	253.0	-5.	.60	226.1	2.	.69	226.1	-4.	.79	191.6	6.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	157.6	1.	.72	134.1	11.	.80	134.1	8.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 7

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	263.4	-4.	.30	263.4	-4.	.40	263.4	-4.	.50	263.4	-4.	.61	252.3	-2.	.69	252.3	-6.	.81	225.5	-2.
		0.25	191.1	-3.	.30	191.1	-3.	.40	191.1	-3.	.50	191.1	-3.	.58	186.2	-2.	.75	167.7	9.	.79	167.7	4.
		0.5	127.0	-1.	.30	127.0	-1.	.40	125.4	0.	.50	125.4	0.	.60	122.6	3.	.71	114.5	6.	.79	114.5	2.
		1.0	56.8	7.	.30	55.0	10.	.40	55.0	9.	.50	55.0	8.	.60	55.0	8.	.71	53.3	10.	.79	53.3	9.
	0.0	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	282.9	-4.	.72	255.4	3.	.80	255.4	-3.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	205.1	-2.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
	-0.98	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	283.0	-4.	.70	283.0	-4.	.80	283.0	-4.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	210.7	-5.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
20.	1.0	0.1	216.1	-1.	.30	198.6	3.	.40	198.6	-0.	.50	198.6	-3.	.62	178.9	1.	.71	159.6	6.	.79	159.6	-0.
		0.25	147.0	3.	.30	147.0	0.	.40	142.9	1.	.49	142.9	-1.	.61	135.3	-0.	.71	116.8	9.	.80	116.8	3.
		0.5	95.7	6.	.31	93.5	7.	.41	93.5	5.	.52	88.7	7.	.61	88.7	4.	.70	78.5	11.	.80	78.5	5.
		1.0	47.8	9.	.31	46.6	10.	.40	46.6	9.	.50	45.2	10.	.61	45.2	9.	.70	43.7	10.	.80	43.7	8.
	0.0	0.1	247.2	-3.	.30	247.2	-5.	.40	234.5	-2.	.50	234.5	-6.	.62	210.6	-2.	.72	182.2	5.	.80	182.2	-2.
		0.25	189.9	-0.	.30	189.9	-3.	.40	176.7	2.	.49	176.7	-0.	.61	162.8	3.	.71	149.6	5.	.80	149.6	-1.
		0.5	137.1	-2.	.30	137.1	-2.	.39	133.0	1.	.50	133.0	0.	.60	126.4	2.	.73	111.8	7.	.81	111.8	0.
		1.0	66.4	-1.	.30	66.4	-1.	.40	65.1	1.	.50	65.1	1.	.60	64.2	3.	.70	64.2	3.	.80	63.4	4.
	-0.98	0.1	281.5	-3.	.30	281.5	-3.	.40	281.5	-3.	.51	273.1	-1.	.60	273.1	-4.	.72	240.9	2.	.81	240.9	-4.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	200.5	0.	.80	200.5	-0.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	65.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
30.	1.0	0.1	152.8	7.	.33	135.9	7.	.44	135.9	2.	.56	120.7	7.	.59	120.7	6.	.72	109.5	9.	.80	109.5	2.
		0.25	93.6	12.	.30	93.1	11.	.41	93.1	9.	.52	87.3	12.	.60	87.3	9.	.70	87.3	5.	.79	79.2	8.
		0.5	70.1	11.	.31	65.5	11.	.42	65.5	8.	.53	61.5	12.	.60	61.5	10.	.73	56.3	12.	.79	56.3	9.
		1.0	38.4	12.	.30	37.8	12.	.41	37.8	10.	.51	36.3	11.	.59	36.3	10.	.71	34.9	12.	.81	34.9	9.
	0.0	0.1	191.6	1.	.30	170.7	4.	.43	170.7	-3.	.51	149.6	6.	.60	149.6	1.	.72	128.3	8.	.81	128.3	-1.
		0.25	133.8	10.	.30	133.8	1.	.41	121.7	5.	.50	121.7	2.	.60	112.6	5.	.70	112.6	0.	.61	101.7	3.
		0.5	101.1	6.	.29	101.1	1.	.40	90.7	9.	.50	90.7	7.	.60	86.0	9.	.71	77.1	13.	.81	77.1	7.
		1.0	57.6	10.	.30	57.6	8.	.40	57.6	6.	.50	57.6	5.	.60	55.5	7.	.70	51.6	10.	.79	51.6	7.
	-0.98	0.1	233.4	3.	.30	233.4	-3.	.40	229.0	-5.	.50	229.0	-8.	.59	212.3	-4.	.71	182.5	4.	.80	182.5	-5.
		0.25	205.2	-3.	.31	194.2	1.	.40	194.2	-1.	.50	194.2	-4.	.60	177.9	0.	.70	155.9	7.	.80	155.9	-2.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	139.2	-2.	.69	139.2	-2.	.82	126.2	-1.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 8

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	384.9	-4.	.30	384.9	-4.	.40	384.9	-4.	.50	384.9	-4.	.60	366.9	0.	.70	365.9	-3.	.80	323.9	5.
		0.25	268.9	-2.	.30	268.9	-2.	.40	268.9	-2.	.50	268.9	-2.	.60	261.1	1.	.68	261.1	1.	.80	232.2	8.
		0.5	157.4	3.	.30	154.8	4.	.40	154.8	4.	.51	150.4	5.	.60	150.4	4.	.70	137.9	9.	.81	137.9	6.
		1.0	60.2	7.	.30	58.1	10.	.41	58.1	9.	.50	58.1	9.	.60	58.1	9.	.70	58.1	8.	.79	56.2	10.
	0.0	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.5	-4.	.69	415.5	-4.	.80	371.9	3.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	291.1	-1.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.50	71.8	-1.	.70	71.8	-1.	.80	71.3	-1.
	-0.98	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.6	-4.	.70	415.6	-4.	.80	415.6	-4.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	300.2	-4.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.50	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
20.	1.0	0.1	308.7	-2.	.30	280.9	4.	.40	280.9	1.	.50	249.7	9.	.61	249.7	5.	.70	249.7	-0.	.79	219.8	6.
		0.25	196.8	4.	.30	196.8	1.	.39	188.0	4.	.49	188.0	2.	.61	171.3	6.	.70	141.5	19.	.80	141.5	14.
		0.5	110.3	11.	.31	107.3	8.	.41	107.3	7.	.51	100.6	11.	.60	100.6	9.	.70	100.6	5.	.79	87.1	15.
		1.0	49.9	9.	.30	49.9	9.	.40	48.6	11.	.50	47.1	12.	.59	47.1	11.	.70	47.1	10.	.81	45.3	12.
	0.0	0.1	358.7	-3.	.30	338.3	2.	.40	338.3	-1.	.50	299.9	7.	.60	299.9	3.	.72	254.8	11.	.80	254.8	6.
		0.25	266.9	-0.	.31	246.3	5.	.40	246.3	3.	.49	246.3	1.	.61	224.8	6.	.72	202.4	10.	.81	202.4	5.
		0.5	175.4	3.	.30	167.0	7.	.40	167.0	5.	.49	167.0	3.	.60	156.4	6.	.71	133.9	16.	.81	133.9	11.
		1.0	71.8	-1.	.30	71.8	-1.	.40	70.1	1.	.50	70.1	1.	.50	69.1	3.	.70	69.1	3.	.80	68.1	4.
	-0.98	0.1	413.2	-3.	.30	413.2	-3.	.40	413.2	-3.	.50	413.2	-3.	.59	400.2	-1.	.73	348.6	7.	.79	348.6	3.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	283.8	1.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.50	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
30.	1.0	0.1	209.1	7.	.33	172.7	13.	.45	172.7	8.	.57	147.5	16.	.60	147.5	15.	.70	147.5	11.	.81	130.4	15.
		0.25	115.9	19.	.31	106.7	19.	.41	106.7	17.	.52	98.8	20.	.60	98.8	18.	.71	88.0	23.	.81	88.0	19.
		0.5	76.4	15.	.32	70.7	16.	.42	70.7	14.	.53	65.8	17.	.61	65.8	15.	.70	65.8	13.	.81	59.7	18.
		1.0	39.5	13.	.30	39.5	12.	.40	38.8	13.	.50	38.8	12.	.60	37.2	14.	.71	35.7	16.	.79	35.7	15.
	0.0	0.1	269.6	-0.	.33	236.9	4.	.41	236.9	0.	.50	236.9	-4.	.60	202.3	5.	.71	159.4	20.	.81	159.4	14.
		0.25	168.2	15.	.30	168.2	6.	.40	149.1	13.	.50	149.1	9.	.59	135.1	15.	.70	118.9	21.	.80	118.9	17.
		0.5	118.1	14.	.32	103.4	18.	.41	103.4	16.	.49	103.4	14.	.59	96.9	16.	.71	85.2	23.	.79	85.2	20.
		1.0	61.1	11.	.30	61.1	9.	.40	61.1	9.	.48	61.1	7.	.59	58.8	10.	.70	54.3	14.	.79	54.3	13.
	-0.98	0.1	336.6	0.	.29	336.6	-3.	.42	329.5	-3.	.50	329.5	-5.	.60	302.7	1.	.70	302.7	-4.	.79	255.3	5.
		0.25	291.3	-3.	.30	273.8	2.	.40	273.8	3.	.50	273.8	-3.	.60	248.1	3.	.70	214.1	12.	.81	214.1	6.
		0.5	185.6	-2.	.30	185.6	-2.	.40	185.6	-2.	.50	185.6	-2.	.60	179.9	1.	.69	179.9	1.	.80	156.1	10.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 9.

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			$P_{GR.}$	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	293.8	-3.	.30	293.8	-3.	.40	293.8	-3.	.50	293.8	-4.	.61	279.7	-2.	.70	279.7	-6.	.79	246.8	0.
		0.25	206.0	-3.	.30	206.0	-3.	.40	206.0	-3.	.50	206.0	-3.	.61	200.3	-2.	.70	200.3	-4.	.79	179.2	3.
		0.5	136.0	-2.	.30	136.0	-2.	.40	134.8	-1.	.50	134.8	-1.	.60	132.5	0.	.70	132.5	0.	.79	126.2	1.
		1.0	67.6	7.	.30	65.6	10.	.40	65.6	9.	.51	65.6	3.	.60	65.6	8.	.71	63.7	8.	.80	63.7	6.
	0.0	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.3	-3.	.72	283.6	4.	.80	283.6	-1.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.50	229.1	-4.	.70	229.1	-4.	.80	222.4	-1.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
	-0.98	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.4	-3.	.70	318.4	-3.	.80	318.4	-3.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.80	229.1	-4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.50	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
20.	1.0	0.1	235.4	-1.	.31	214.8	2.	.42	214.8	-1.	.51	191.9	6.	.60	191.9	4.	.74	170.1	6.	.80	170.1	2.
		0.25	155.9	2.	.31	151.4	2.	.40	151.4	-0.	.50	151.4	-2.	.60	143.0	1.	.72	128.0	7.	.80	128.0	1.
		0.5	109.7	-2.	.30	109.7	-2.	.41	107.5	-1.	.50	107.5	-3.	.60	102.4	-0.	.72	91.5	5.	.80	91.6	-1.
		1.0	57.1	6.	.31	55.7	8.	.40	55.7	6.	.51	54.1	8.	.60	54.1	6.	.69	54.1	4.	.81	52.2	3.
	0.0	0.1	273.3	-1.	.31	257.7	1.	.41	257.7	-2.	.50	257.7	-6.	.60	228.9	1.	.70	195.7	9.	.80	195.7	3.
		0.25	204.6	-4.	.31	189.5	4.	.41	189.5	1.	.49	189.5	-1.	.60	173.7	4.	.72	158.9	7.	.80	158.9	1.
		0.5	145.0	-2.	.30	145.0	-2.	.39	140.9	1.	.49	140.9	-1.	.59	135.5	1.	.71	124.1	5.	.81	124.1	-2.
		1.0	78.4	-1.	.30	78.4	-1.	.40	76.9	1.	.50	76.9	1.	.60	76.0	3.	.70	75.0	3.	.80	75.1	2.
	-0.98	0.1	316.5	-3.	.30	316.5	-3.	.40	316.5	-3.	.50	305.9	0.	.62	305.9	-4.	.72	265.5	4.	.81	265.5	-4.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.81	217.0	-1.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.50	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
30.	1.0	0.1	162.4	3.	.32	143.7	7.	.44	143.7	0.	.58	131.0	3.	.60	131.0	2.	.71	122.3	4.	.80	122.3	-0.
		0.25	113.8	1.	.31	107.0	1.	.43	107.0	-2.	.53	101.0	1.	.60	101.0	-1.	.70	92.4	5.	.78	92.4	1.
		0.5	82.5	1.	.32	77.4	2.	.42	77.4	-1.	.53	72.9	3.	.60	72.9	0.	.69	72.9	-3.	.79	67.1	1.
		1.0	46.1	6.	.30	46.1	5.	.41	45.3	5.	.52	43.6	6.	.59	43.6	5.	.71	42.0	6.	.81	42.0	2.
	0.0	0.1	206.6	-1.	.32	182.6	5.	.42	182.6	-1.	.50	158.8	7.	.60	158.8	1.	.71	137.0	9.	.80	137.0	4.
		0.25	141.5	7.	.32	131.8	5.	.41	131.8	1.	.50	131.8	-2.	.50	124.7	-1.	.70	124.7	-5.	.81	116.0	-4.
		0.5	115.4	-4.	.32	104.5	1.	.40	104.5	-1.	.48	104.5	-2.	.60	99.5	-1.	.71	93.0	5.	.80	90.0	-1.
		1.0	68.5	6.	.31	68.5	4.	.40	68.5	1.	.49	68.5	0.	.60	66.3	0.	.69	66.3	-2.	.80	61.6	1.
	-0.98	0.1	256.4	3.	.31	251.0	3.	.42	251.0	-0.	.49	251.0	-3.	.57	230.9	2.	.68	230.9	-4.	.80	196.1	1.
		0.25	222.5	-3.	.31	209.6	1.	.41	209.6	-2.	.50	209.6	-5.	.61	190.8	0.	.72	165.9	7.	.79	165.9	2.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	147.3	-2.	.69	147.3	-2.	.79	135.3	1.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.50	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 10

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	412.7	-4.	.30	412.7	-4.	.40	412.7	-4.	.50	412.7	-4.	.60	391.5	-0.	.70	341.8	9.	.81	341.8	4.
		0.25	280.2	-2.	.30	280.2	-2.	.40	280.2	-2.	.50	280.2	-2.	.60	271.7	0.	.71	240.5	10.	.81	240.5	8.
		0.5	176.6	-0.	.30	176.6	-0.	.40	174.0	1.	.50	174.0	1.	.61	169.5	2.	.71	156.8	7.	.80	156.8	4.
		1.0	72.2	7.	.30	69.8	10.	.40	69.8	9.	.51	69.8	9.	.60	69.8	8.	.70	67.7	10.	.79	67.7	10.
	0.0	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.4	-4.	.69	449.4	-5.	.81	397.4	2.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	304.3	-1.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
	-0.98	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.5	-4.	.70	449.5	-4.	.80	449.5	-4.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	314.9	-4.
		0.5	193.7	-3.	.30	193.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
20.	1.0	0.1	324.5	-1.	.31	293.4	3.	.42	293.4	-1.	.52	259.3	8.	.60	259.3	4.	.71	227.3	11.	.80	227.3	6.
		0.25	200.8	1.	.30	200.4	1.	.40	200.4	-1.	.50	200.4	-3.	.60	188.5	0.	.71	160.5	11.	.80	160.5	7.
		0.5	128.1	5.	.32	124.9	3.	.42	124.9	1.	.53	117.7	4.	.60	117.7	3.	.71	103.0	11.	.79	103.0	8.
		1.0	60.5	7.	.30	59.0	9.	.40	59.0	7.	.51	57.2	8.	.60	57.2	8.	.70	55.3	9.	.80	55.3	7.
	0.0	0.1	351.9	-2.	.30	358.2	2.	.41	358.2	-2.	.50	358.2	-5.	.61	314.6	3.	.71	264.9	13.	.81	264.9	6.
		0.25	278.1	-0.	.31	255.6	4.	.40	255.6	2.	.49	255.6	-1.	.60	232.5	5.	.70	211.0	9.	.80	211.0	5.
		0.5	191.4	-2.	.30	191.4	-2.	.39	185.5	1.	.50	185.5	-1.	.60	175.6	1.	.70	152.7	11.	.80	152.7	5.
		1.0	85.3	1.	.30	85.3	1.	.40	83.4	3.	.50	83.4	3.	.60	82.3	4.	.70	82.3	4.	.81	81.2	5.
	-0.98	0.1	446.6	-3.	.30	446.6	-3.	.40	446.6	-3.	.50	446.6	-3.	.59	430.8	-0.	.70	430.8	-5.	.79	370.1	4.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	296.7	2.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
30.	1.0	0.1	216.1	2.	.31	189.5	6.	.42	189.5	-0.	.54	166.6	6.	.60	166.6	4.	.70	166.6	-1.	.80	149.1	5.
		0.25	133.9	7.	.31	124.2	8.	.42	124.2	4.	.54	115.7	8.	.60	115.7	6.	.69	115.7	4.	.81	104.6	8.
		0.5	90.7	5.	.31	84.1	8.	.42	84.1	6.	.52	78.5	9.	.60	78.5	7.	.70	71.6	12.	.78	71.6	9.
		1.0	48.7	8.	.30	47.9	7.	.41	47.9	5.	.51	46.0	8.	.60	46.0	6.	.69	46.0	5.	.81	44.3	6.
	0.0	0.1	281.0	-2.	.30	245.6	6.	.43	245.6	-1.	.50	211.0	9.	.60	211.0	3.	.70	211.0	-3.	.80	178.6	7.
		0.25	186.3	4.	.31	168.2	5.	.42	168.2	0.	.50	153.9	6.	.59	153.9	3.	.70	153.9	-1.	.80	137.1	5.
		0.5	136.2	2.	.31	120.6	8.	.41	120.6	5.	.49	120.6	3.	.60	113.7	5.	.70	113.7	2.	.80	100.9	3.
		1.0	73.2	8.	.30	73.2	6.	.40	73.2	4.	.49	73.2	2.	.59	70.5	4.	.69	70.5	2.	.80	65.4	7.
	-0.98	0.1	356.3	-0.	.30	348.1	2.	.41	348.1	-0.	.50	348.1	-2.	.60	317.7	3.	.70	265.5	15.	.80	265.5	8.
		0.25	305.0	-3.	.31	285.6	1.	.40	285.6	-2.	.50	285.6	-4.	.60	257.6	2.	.70	257.6	-3.	.81	221.2	5.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	194.6	-1.	.69	194.6	-1.	.80	175.2	4.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 11

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	307.1	-3.	.30	307.1	-3.	.40	307.1	-3.	.49	307.1	-3.	.62	294.6	-1.	.70	265.2	6.	.79	265.2	3.
		0.25	227.2	-2.	.30	227.2	-2.	.40	227.2	-2.	.50	227.2	-2.	.60	221.7	1.	.70	201.1	5.	.80	201.1	3.
		0.5	157.1	-1.	.30	157.1	-1.	.40	155.8	-1.	.50	155.8	-1.	.60	153.4	1.	.70	153.4	1.	.81	146.7	2.
		1.0	84.0	7.	.30	84.0	7.	.40	81.7	9.	.51	81.7	9.	.61	81.7	8.	.71	79.5	9.	.80	79.5	8.
	0.0	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.8	-3.	.71	296.0	4.	.73	298.0	0.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	242.7	-2.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
	-0.98	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.9	-3.	.70	328.9	-3.	.80	328.9	-3.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
20.	1.0	0.1	254.8	0.	.30	235.6	5.	.40	235.6	2.	.49	235.6	-0.	.61	213.6	5.	.72	192.1	9.	.81	192.1	3.
		0.25	177.7	4.	.30	177.7	2.	.39	173.1	4.	.49	173.1	2.	.60	164.4	4.	.72	148.6	9.	.79	143.6	5.
		0.5	130.7	0.	.30	130.7	0.	.40	128.3	2.	.49	128.3	1.	.61	122.9	3.	.72	111.1	7.	.81	111.1	2.
		1.0	72.0	8.	.30	70.4	9.	.41	70.4	8.	.51	68.5	10.	.60	68.5	9.	.70	66.4	8.	.80	66.4	5.
	0.0	0.1	288.9	-0.	.30	275.0	2.	.41	275.0	-1.	.50	275.0	-3.	.60	248.7	3.	.72	217.3	9.	.81	217.3	2.
		0.25	225.8	1.	.30	225.8	-0.	.40	211.2	4.	.49	211.2	3.	.60	195.7	7.	.71	180.7	9.	.80	180.7	4.
		0.5	166.5	-1.	.30	166.5	-1.	.40	162.2	2.	.49	162.2	2.	.59	156.6	5.	.72	144.5	7.	.81	144.5	3.
		1.0	96.3	-0.	.30	96.3	-0.	.40	94.6	1.	.50	94.6	1.	.60	93.6	3.	.70	93.6	3.	.80	92.6	4.
	-0.98	0.1	327.1	-2.	.30	327.1	-2.	.40	327.1	-2.	.51	317.8	-1.	.60	317.8	-3.	.70	317.8	-7.	.79	281.9	-1.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	237.6	1.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
30.	1.0	0.1	184.3	11.	.33	165.2	12.	.44	165.2	8.	.54	151.8	11.	.60	151.8	9.	.69	151.8	6.	.79	142.6	6.
		0.25	134.3	8.	.31	127.8	7.	.41	127.8	5.	.50	121.3	7.	.60	121.3	5.	.70	111.9	10.	.79	111.9	4.
		0.5	101.0	4.	.30	95.2	7.	.40	95.2	5.	.50	95.2	3.	.60	90.1	6.	.72	83.4	9.	.80	83.4	4.
		1.0	58.9	11.	.30	58.0	9.	.40	58.0	8.	.51	55.9	10.	.60	55.9	8.	.69	55.9	7.	.78	53.9	7.
	0.0	0.1	227.7	4.	.31	204.5	8.	.42	204.5	4.	.50	180.7	11.	.60	180.7	6.	.69	180.7	2.	.81	158.2	7.
		0.25	162.8	12.	.30	152.7	11.	.42	152.7	8.	.49	152.7	6.	.60	145.1	7.	.69	145.1	4.	.80	136.1	3.
		0.5	135.6	2.	.30	125.1	6.	.40	125.1	5.	.50	125.1	2.	.59	119.7	5.	.72	109.4	9.	.79	109.4	4.
		1.0	85.1	8.	.30	85.1	7.	.40	85.1	5.	.49	85.1	4.	.60	82.4	5.	.70	82.4	2.	.80	77.2	4.
	-0.95	0.1	273.9	7.	.30	273.9	0.	.40	269.0	-2.	.50	269.0	-5.	.59	250.6	-1.	.71	217.7	7.	.81	217.7	-1.
		0.25	242.8	-2.	.30	230.7	3.	.40	230.7	1.	.49	230.7	-2.	.60	212.5	3.	.71	187.9	9.	.81	187.9	3.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	168.9	-2.	.69	168.9	-2.	.80	156.4	3.
		1.0	95.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 12

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	427.4	-3.	.30	427.4	-3.	.40	427.4	-3.	.50	408.5	1.	.60	408.5	0.	.70	408.5	-2.	.80	363.8	6.
		0.25	306.6	-2.	.30	306.6	-2.	.40	306.6	-2.	.50	306.6	-2.	.60	298.5	1.	.69	298.5	1.	.81	268.1	9.
		0.5	204.5	-0.	.30	204.5	-0.	.40	201.9	1.	.50	201.9	1.	.60	197.2	3.	.71	184.0	8.	.80	184.0	5.
		1.0	90.8	7.	.30	87.9	10.	.40	87.9	9.	.50	87.9	9.	.60	87.9	8.	.70	65.3	11.	.79	85.3	10.
	0.0	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	459.9	-4.	.69	459.9	-4.	.81	413.7	3.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	329.8	-1.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	105.2	-0.	.80	106.2	-0.
	-0.98	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	460.0	-4.	.70	460.0	-4.	.80	460.0	-4.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	339.1	-4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
20.	1.0	0.1	348.0	-1.	.31	319.1	4.	.40	319.1	2.	.50	319.1	-1.	.60	286.5	6.	.71	295.0	12.	.81	255.0	7.
		0.25	234.4	4.	.30	234.4	2.	.39	227.8	3.	.49	227.8	1.	.60	215.4	4.	.70	187.9	14.	.82	187.9	9.
		0.5	153.5	7.	.31	150.0	7.	.41	150.0	5.	.53	142.1	8.	.60	142.1	7.	.70	125.7	14.	.81	125.7	10.
		1.0	76.4	10.	.31	74.5	11.	.41	74.5	9.	.51	72.3	11.	.60	72.3	10.	.70	69.8	12.	.80	69.8	10.
	0.0	0.1	399.9	-2.	.31	378.7	2.	.40	378.7	-0.	.49	378.7	-3.	.51	338.9	3.	.71	291.9	12.	.80	291.9	6.
		0.25	304.6	1.	.30	283.0	6.	.40	283.0	4.	.49	283.0	2.	.60	260.2	7.	.71	238.6	11.	.80	238.6	7.
		0.5	213.4	-0.	.30	218.4	-0.	.40	212.2	3.	.49	212.2	3.	.51	203.4	5.	.71	179.7	12.	.80	179.7	8.
		1.0	106.2	-0.	.30	106.2	-0.	.40	104.1	2.	.50	104.1	2.	.50	102.8	3.	.70	102.8	3.	.80	101.5	4.
	-0.98	0.1	457.4	-3.	.30	457.4	-3.	.40	457.4	-3.	.50	443.3	-0.	.59	443.3	-1.	.71	389.4	8.	.80	389.4	3.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	322.2	1.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
30.	1.0	0.1	243.8	9.	.33	216.5	9.	.44	216.5	5.	.56	194.2	11.	.60	194.2	9.	.68	194.2	6.	.79	175.9	9.
		0.25	159.8	12.	.31	149.3	12.	.40	149.3	10.	.51	139.9	14.	.60	139.9	11.	.71	126.9	17.	.81	126.9	12.
		0.5	112.2	10.	.31	104.8	11.	.41	104.8	10.	.51	98.4	13.	.59	98.4	11.	.71	90.0	16.	.81	90.0	12.
		1.0	61.4	12.	.31	60.4	12.	.41	60.4	11.	.52	58.0	13.	.60	58.0	11.	.70	58.0	16.	.80	55.3	[illegible]
	0.0	0.1	307.4	2.	.33	273.1	6.	.41	273.1	2.	.50	273.1	-2.	.60	238.6	6.	.71	206.6	14.	.80	206.6	9.
		0.25	213.1	11.	.30	195.8	11.	.41	195.8	7.	.49	195.8	4.	.60	181.0	8.	.70	181.0	5.	.80	163.2	10.
		0.5	162.2	7.	.32	145.3	12.	.41	145.3	10.	.50	145.3	8.	.60	137.7	11.	.70	137.7	8.	.80	123.4	12.
		1.0	92.0	10.	.31	92.0	8.	.39	92.0	8.	.48	92.0	6.	.59	88.8	8.	.70	88.8	6.	.79	82.5	10.
	-0.98	0.1	376.9	3.	.29	376.9	-1.	.40	369.6	-2.	.50	369.6	-5.	.59	341.7	0.	.72	292.5	10.	.80	292.5	5.
		0.25	329.9	-2.	.30	311.8	3.	.40	311.8	0.	.49	311.8	-1.	.60	284.9	4.	.71	245.9	12.	.80	243.9	7.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	221.8	-1.	.69	221.8	-1.	.80	203.1	6.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	105.2	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 13

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	228.9	-5.	.30	228.9	-5.	.40	228.9	-5.	.51	217.8	-1.	.61	217.8	-5.	.74	217.8	-10.	.78	191.4	-3.
		0.25	149.6	-5.	.30	149.6	-5.	.40	149.6	-5.	.51	144.0	-3.	.63	144.0	-6.	.73	129.8	2.	.78	129.9	-2.
		0.5	79.2	2.	.30	79.2	2.	.40	77.6	2.	.53	74.6	2.	.60	74.6	-1.	.72	68.2	5.	.80	69.2	1.
		1.0	30.1	2.	.31	29.4	3.	.41	29.4	2.	.52	28.9	3.	.63	28.9	1.	.75	28.2	2.	.80	28.2	2.
	0.0	0.1	247.9	-5.	.30	247.9	-5.	.40	247.9	-5.	.50	247.9	-5.	.60	247.8	-5.	.69	247.8	-7.	.81	220.5	-6.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	163.0	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.82	97.4	-8.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
	-0.98	0.1	247.9	-5.	.30	247.9	-5.	.40	247.9	-5.	.50	247.9	-5.	.60	247.9	-5.	.70	247.9	-5.	.80	240.0	-4.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	171.2	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.80	97.4	-1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
20.	1.0	0.1	174.3	-5.	.32	158.1	-0.	.45	158.1	-8.	.45	158.1	-8.	.54	139.2	-8.	.64	139.2	-8.	.79	117.4	-3.
		0.25	93.1	2.	.31	87.8	3.	.44	87.8	-1.	.52	80.7	4.	.59	80.7	2.	.68	80.7	-3.	.79	71.7	1.
		0.5	48.5	8.	.32	46.7	7.	.43	46.7	4.	.56	43.1	8.	.56	43.1	8.	.73	38.8	12.	.79	38.9	10.
		1.0	23.8	6.	.31	23.4	3.	.42	23.4	1.	.55	22.6	2.	.55	22.6	2.	.68	22.6	-0.	.80	21.1	4.
	0.0	0.1	208.9	-4.	.30	198.0	0.	.41	198.0	-5.	.51	175.7	2.	.60	175.7	-5.	.69	175.7	-14.	.79	146.4	-4.
		0.25	149.5	-5.	.32	133.6	-0.	.42	133.6	-6.	.49	133.6	-10.	.61	119.6	-5.	.71	103.0	4.	.79	103.0	-2.
		0.5	85.8	1.	.31	80.4	4.	.41	80.4	1.	.50	84.4	-2.	.60	74.3	1.	.70	65.1	8.	.80	65.1	2.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	33.8	1.	.72	32.1	4.	.60	32.1	3.
	-0.98	0.1	247.3	-4.	.30	247.3	-4.	.40	247.3	-4.	.50	241.6	-2.	.60	241.6	-4.	.69	241.6	-10.	.81	206.7	-5.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	161.0	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.80	97.4	-1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
30.	1.0	0.1	85.6	17.	.37	75.4	12.	.37	75.4	12.	.49	75.4	3.	.51	64.6	9.	.75	53.5	16.	.80	53.5	13.
		0.25	45.3	18.	.33	42.5	15.	.46	42.5	11.	.46	42.5	11.	.51	39.6	12.	.68	39.6	10.	.80	35.3	13.
		0.5	23.0	17.	.33	27.9	13.	.45	27.9	10.	.45	27.9	10.	.59	26.3	11.	.75	24.3	13.	.80	24.3	12.
		1.0	17.7	10.	.32	17.7	4.	.44	17.7	2.	.44	17.7	2.	.57	17.0	3.	.69	17.0	0.	.82	16.4	2.
	0.0	0.1	123.0	10.	.32	115.4	9.	.42	115.4	2.	.51	97.2	12.	.61	97.2	4.	.72	74.1	19.	.79	74.1	14.
		0.25	70.2	20.	.28	70.2	5.	.38	62.3	11.	.51	54.8	16.	.59	54.8	12.	.70	46.9	21.	.80	46.9	15.
		0.5	44.2	17.	.30	44.2	10.	.43	41.8	11.	.50	41.8	9.	.60	35.8	12.	.69	38.[illegible]	9.	.79	35.5	12.
		1.0	27.0	11.	.32	26.1	8.	.40	26.1	7.	.50	26.1	4.	.59	24.9	7.	.71	22.7	12.	.80	22.7	9.
	-0.99	0.1	169.1	3.	.30	169.1	3.	.40	169.1	3.	.50	169.1	3.	.60	169.1	3.	.73	150.7	5.	.81	150.7	-4.
		0.25	156.3	-3.	.30	153.4	-1.	.41	153.4	-5.	.50	138.5	1.	.61	138.5	-6.	.72	117.0	3.	.80	117.0	-4.
		0.5	97.4	-1.	.30	96.3	0.	.40	96.3	-1.	.50	96.3	-4.	.59	88.7	1.	.66	86.7	-4.	.81	77.4	1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 14

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	F_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	F_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	352.0	-5.	.30	352.0	-5.	.40	352.0	-5.	.50	352.0	-5.	.62	333.9	-2.	.78	290.5	4.	.80	290.5	2.
		0.25	219.9	-4.	.30	219.9	-4.	.40	219.9	-4.	.50	210.5	-0.	.62	210.5	-3.	.77	186.1	4.	.81	186.1	0.
		0.5	97.2	0.	.30	94.8	2.	.41	94.8	0.	.53	90.4	3.	.65	90.4	-0.	.77	81.4	6.	.80	81.4	5.
		1.0	33.3	-0.	.31	32.5	1.	.41	32.5	-1.	.52	31.9	0.	.63	31.9	-1.	.73	31.1	0.	.83	31.1	-1.
	0.0	0.1	382.8	-5.	.30	382.8	-5.	.40	382.8	-5.	.50	382.8	-5.	.60	382.7	-5.	.69	382.7	-5.	.80	338.4	3.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	256.4	-5.	.70	256.4	-5.	.80	242.6	1.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
	-0.98	0.1	382.8	-5.	.30	382.8	-5.	.40	382.8	-5.	.50	382.8	-5.	.60	382.8	-5.	.70	382.8	-5.	.80	379.8	-4.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	256.4	-5.	.70	256.4	-5.	.80	250.4	-5.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
20.	1.0	0.1	261.6	-3.	.31	234.4	6.	.44	234.4	-0.	.44	234.4	-0.	.59	202.3	5.	.72	166.1	14.	.84	166.1	5.
		0.25	118.4	10.	.32	110.1	10.	.44	110.1	7.	.58	99.4	12.	.58	99.4	12.	.67	99.4	8.	.82	80.2	13.
		0.5	55.4	12.	.32	53.2	9.	.44	53.2	6.	.58	48.7	11.	.54	48.7	9.	.73	43.5	16.	.80	43.5	14.
		1.0	26.1	5.	.32	25.7	1.	.43	25.7	0.	.54	24.7	2.	.67	24.7	0.	.72	23.6	0.	.79	23.0	4.
	0.0	0.1	319.2	-5.	.30	301.4	1.	.40	301.4	-0.	.51	264.0	8.	.62	264.0	0.	.72	214.4	12.	.81	214.4	5.
		0.25	218.1	-4.	.30	218.1	-7.	.41	192.7	1.	.50	169.6	9.	.60	169.6	4.	.71	134.7	18.	.79	134.7	13.
		0.5	107.1	5.	.31	98.9	8.	.40	98.9	6.	.50	90.0	11.	.60	90.0	8.	.70	77.1	17.	.80	77.1	13.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	37.6	-1.	.72	35.7	3.	.79	35.7	2.
	-0.98	0.1	381.8	-5.	.30	381.8	-5.	.40	381.8	-5.	.50	381.8	-5.	.59	372.6	-2.	.73	315.7	9.	.79	315.7	4.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	256.4	-5.	.70	256.4	-5.	.80	240.2	2.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
30.	1.0	0.1	111.3	33.	.35	91.5	36.	.35	91.5	36.	.52	76.4	39.	.62	76.4	35.	.73	61.7	42.	.81	61.7	38.
		0.25	51.5	28.	.35	47.9	23.	.35	47.9	23.	.49	47.9	19.	.64	44.5	21.	.72	40.1	26.	.80	40.1	24.
		0.5	32.1	22.	.34	30.8	17.	.46	30.8	13.	.46	30.8	13.	.59	29.0	16.	.74	26.7	19.	.81	26.7	17.
		1.0	19.3	11.	.32	19.3	5.	.44	19.3	2.	.44	19.3	2.	.57	18.5	4.	.69	18.5	1.	.80	17.5	5.
	0.0	0.1	175.1	17.	.31	163.0	20.	.42	163.0	15.	.51	124.9	31.	.61	124.9	26.	.72	89.7	42.	.81	69.7	33.
		0.25	84.1	37.	.30	73.3	35.	.40	73.3	31.	.51	63.4	36.	.61	63.4	31.	.70	63.4	27.	.80	53.4	34.
		0.5	50.1	26.	.32	47.2	21.	.41	47.2	19.	.50	47.2	17.	.60	43.5	21.	.70	43.5	18.	.80	39.6	22.
		1.0	29.7	13.	.31	28.7	10.	.40	28.7	8.	.50	28.7	6.	.59	27.3	9.	.69	27.3	7.	.81	24.9	13.
	-0.98	0.1	252.8	7.	.30	252.8	7.	.40	252.8	7.	.50	252.8	7.	.59	252.8	7.	.73	221.8	13.	.81	221.8	7.
		0.25	231.3	-0.	.30	231.3	-0.	.40	226.3	1.	.51	201.2	7.	.60	201.2	3.	.71	165.5	14.	.80	165.5	8.
		0.5	125.2	-1.	.30	125.2	-1.	.40	123.3	1.	.51	111.6	9.	.60	111.6	6.	.69	111.6	2.	.80	94.5	12.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 15

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	235.7	-4.	.30	235.7	-4.	.40	235.7	-4.	.50	235.7	-4.	.63	225.4	-4.	.73	201.3	1.	.82	201.3	-6.
		0.25	162.4	-3.	.30	162.4	-3.	.40	162.4	-3.	.50	157.1	-0.	.61	157.1	-1.	.69	157.1	-4.	.81	143.4	-5.
		0.5	95.1	1.	.30	95.1	1.	.40	93.4	3.	.52	90.3	3.	.54	90.3	0.	.79	83.6	0.	.83	83.6	-3.
		1.0	37.3	1.	.30	37.3	1.	.40	36.4	4.	.50	36.4	4.	.60	35.7	5.	.71	34.8	7.	.80	34.8	6.
	0.0	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.60	253.2	-5.	.72	227.9	2.	.79	227.9	-4.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	162.6	-5.	.79	175.0	-3.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-7.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
	-0.98	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.60	253.3	-5.	.70	253.3	-5.	.80	251.6	-4.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	182.6	-5.	.80	182.6	-5.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-3.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
20.	1.0	0.1	185.5	-1.	.32	170.5	1.	.45	170.5	-5.	.53	152.5	3.	.62	152.5	-3.	.75	131.9	2.	.81	131.9	-3.
		0.25	103.8	7.	.32	103.6	6.	.44	103.6	3.	.57	96.5	6.	.57	96.6	6.	.77	87.2	4.	.80	87.2	2.
		0.5	61.1	11.	.31	58.9	10.	.43	58.9	7.	.57	54.4	11.	.57	54.4	11.	.71	48.8	16.	.79	48.8	13.
		1.0	29.0	7.	.31	28.6	8.	.41	28.6	7.	.52	27.4	10.	.63	27.4	9.	.69	27.4	8.	.81	25.5	12.
	0.0	0.1	217.2	-3.	.30	207.3	0.	.41	207.3	-4.	.50	207.3	-7.	.63	186.8	-6.	.72	159.3	2.	.80	159.3	-5.
		0.25	161.4	-2.	.30	147.1	3.	.41	147.1	-1.	.50	147.1	-4.	.60	134.0	0.	.71	113.2	6.	.80	113.2	-0.
		0.5	101.7	3.	.30	96.2	6.	.41	96.2	3.	.49	96.2	1.	.61	90.1	3.	.70	80.2	9.	.81	80.2	2.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	42.3	2.	.69	42.3	2.	.80	40.0	6.
	-0.98	0.1	252.7	-4.	.30	252.7	-4.	.40	252.7	-4.	.50	252.7	-4.	.60	247.4	-4.	.69	247.4	-9.	.81	215.2	-6.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	173.7	0.	.81	173.7	-5.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.61	112.9	-7.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
30.	1.0	0.1	104.4	14.	.33	91.1	18.	.33	91.1	18.	.49	91.1	10.	.58	79.7	16.	.69	79.7	9.	.80	67.0	19.
		0.25	57.2	22.	.32	53.6	21.	.45	53.6	18.	.45	53.6	18.	.60	50.0	19.	.60	50.0	19.	.83	45.0	19.
		0.5	35.9	22.	.32	34.4	21.	.44	34.4	19.	.56	32.4	21.	.56	32.4	21.	.70	32.4	18.	.81	29.4	21.
		1.0	21.2	15.	.31	21.2	13.	.42	21.2	11.	.53	20.3	14.	.65	20.3	12.	.77	19.2	16.	.61	19.2	15.
	0.0	0.1	137.2	9.	.29	137.2	7.	.42	130.1	5.	.50	112.7	13.	.61	112.7	5.	.70	112.7	-1.	.81	89.3	12.
		0.25	85.7	19.	.27	85.7	14.	.41	77.1	17.	.50	68.5	22.	.58	68.5	18.	.69	68.5	14.	.78	59.1	22.
		0.5	55.8	21.	.30	52.8	21.	.41	52.8	18.	.50	52.8	16.	.60	48.9	19.	.69	48.9	16.	.81	44.5	18.
		1.0	33.2	14.	.28	33.2	12.	.40	32.0	14.	.49	32.0	13.	.60	30.4	15.	.69	30.4	13.	.79	27.7	19.
	-0.98	0.1	180.7	3.	.30	180.7	3.	.40	180.7	3.	.49	180.7	3.	.59	180.7	2.	.69	180.7	-5.	.81	163.5	-5.
		0.25	168.8	0.	.30	166.0	1.	.40	166.0	-2.	.50	166.0	-6.	.60	151.9	-2.	.71	131.6	5.	.80	131.6	-2.
		0.5	112.9	-3.	.30	112.9	-3.	.40	111.8	-2.	.50	104.6	4.	.61	104.6	3.	.69	104.6	-2.	.80	93.2	2.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 16

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	F_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	359.1	-5.	.30	359.1	-5.	.40	359.1	-5.	.50	342.1	0.	.60	342.1	-0.	.75	301.7	6.	.81	301.7	3.
		0.25	236.1	-3.	.30	236.1	-3.	.40	236.1	-3.	.50	236.1	-3.	.60	227.2	1.	.77	204.4	5.	.80	204.4	3.
		0.5	116.7	2.	.30	114.1	3.	.41	114.1	1.	.53	109.3	3.	.65	109.3	1.	.65	109.3	1.	.78	99.1	7.
		1.0	38.9	2.	.30	38.9	2.	.40	38.0	4.	.50	38.0	4.	.61	37.2	5.	.78	36.2	7.	.79	36.2	7.
	0.0	0.1	388.0	-5.	.30	388.0	-5.	.40	388.0	-5.	.50	388.0	-5.	.60	387.8	-5.	.69	387.8	-5.	.80	346.3	3.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	257.2	0.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
	-0.98	0.1	388.0	-5.	.30	388.0	-5.	.40	388.0	-5.	.50	388.0	-5.	.60	388.0	-5.	.70	388.0	-5.	.80	385.1	-4.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	270.1	-5.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
20.	1.0	0.1	275.0	-1.	.31	249.6	5.	.43	249.6	1.	.43	249.6	1.	.58	219.4	6.	.67	219.4	1.	.78	185.6	8.
		0.25	138.7	13.	.32	130.3	14.	.44	130.3	10.	.44	130.3	10.	.58	119.0	14.	.76	104.5	17.	.82	104.5	14.
		0.5	67.3	14.	.31	64.5	15.	.43	64.5	13.	.55	58.7	19.	.55	58.7	19.	.68	58.7	15.	.81	51.9	21.
		1.0	30.1	9.	.31	29.6	9.	.41	29.6	8.	.52	28.4	11.	.63	28.4	10.	.74	26.3	15.	.73	26.3	15.
	0.0	0.1	328.4	-4.	.30	328.4	-4.	.40	311.8	0.	.50	311.8	-4.	.62	277.2	1.	.70	277.2	-5.	.81	230.9	3.
		0.25	234.4	-1.	.31	210.5	6.	.40	210.5	3.	.50	210.5	-0.	.61	189.0	6.	.71	154.8	18.	.80	154.8	13.
		0.5	127.2	6.	.31	118.5	10.	.40	118.5	8.	.50	118.5	5.	.60	103.8	10.	.71	94.2	18.	.81	94.2	14.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	44.5	2.	.70	44.5	2.	.60	42.0	7.
	-0.98	0.1	387.0	-5.	.30	387.0	-5.	.40	387.0	-5.	.50	387.0	-5.	.59	378.5	-2.	.72	325.1	8.	.80	325.1	3.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	255.0	1.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.5	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
30.	1.0	0.1	131.5	27.	.33	110.5	33.	.47	110.5	27.	.47	110.5	27.	.67	93.4	31.	.74	75.4	42.	.82	75.4	38.
		0.25	62.2	32.	.33	57.7	31.	.45	57.7	29.	.45	57.7	29.	.65	53.3	30.	.75	47.6	35.	.81	47.6	33.
		0.5	37.5	26.	.32	35.8	26.	.45	35.8	24.	.45	35.8	24.	.57	33.6	27.	.70	33.6	24.	.79	30.3	29.
		1.0	21.8	18.	.31	21.8	15.	.42	21.8	14.	.54	20.9	16.	.65	20.9	15.	.77	19.7	16.	.79	19.7	18.
	0.0	0.1	194.2	13.	.30	182.1	18.	.41	182.1	13.	.51	145.2	27.	.61	145.2	22.	.71	108.4	37.	.81	108.4	32.
		0.25	102.2	32.	.30	102.2	26.	.41	89.7	31.	.50	89.7	28.	.60	77.6	35.	.71	64.7	42.	.81	64.7	39.
		0.5	60.5	31.	.30	60.5	25.	.40	56.7	28.	.50	56.7	26.	.59	52.0	30.	.71	46.9	34.	.80	46.9	32.
		1.0	34.5	17.	.31	33.2	18.	.40	33.2	16.	.49	33.2	15.	.59	31.5	19.	.69	31.5	18.	.60	28.6	24.
	-0.98	0.1	266.8	6.	.30	266.8	6.	.40	266.8	6.	.50	266.8	6.	.60	266.8	6.	.68	266.8	3.	.81	237.9	4.
		0.25	246.8	1.	.30	246.8	1.	.40	242.1	1.	.50	242.1	-2.	.60	218.4	4.	.70	218.4	-2.	.81	185.1	6.
		0.5	145.6	-2.	.30	145.6	-2.	.40	143.6	-1.	.50	131.8	8.	.60	131.8	7.	.73	113.8	15.	.81	113.8	12.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 17

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	290.6	-3.	.30	290.6	-3.	.40	290.6	-3.	.50	290.6	-5.	.60	277.6	-2.	.70	247.3	5.	.79	247.3	-2.
		0.25	200.2	-3.	.30	200.2	-3.	.40	200.2	-3.	.50	200.2	-4.	.59	193.9	-2.	.70	177.7	4.	.78	177.7	-2.
		0.5	127.2	-2.	.30	127.2	-2.	.40	125.7	-1.	.50	125.7	-1.	.60	123.0	2.	.70	123.0	2.	.80	117.2	2.
		1.0	64.1	4.	.30	64.1	4.	.40	62.8	6.	.49	62.8	6.	.59	61.8	6.	.71	60.4	7.	.79	60.4	4.
	0.0	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	313.1	-3.	.72	280.8	4.	.81	280.8	-2.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.81	215.3	-5.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
	-0.98	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	313.2	-3.	.70	313.2	-3.	.80	311.0	-2.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.80	224.4	-4.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
20.	1.0	0.1	227.9	-4.	.30	209.8	2.	.40	209.8	-3.	.49	209.8	-8.	.59	188.4	-1.	.69	188.4	-7.	.79	164.1	-3.
		0.25	139.4	4.	.30	139.4	0.	.39	134.7	2.	.50	134.7	-1.	.60	128.5	0.	.70	128.5	-3.	.81	120.3	-2.
		0.5	96.8	0.	.30	96.8	0.	.39	93.9	1.	.48	93.9	-1.	.59	87.9	2.	.69	87.9	-1.	.79	80.3	3.
		1.0	51.7	3.	.29	51.7	3.	.39	51.0	4.	.49	51.0	2.	.59	49.2	4.	.71	46.1	8.	.80	46.1	5.
	0.0	0.1	267.2	-3.	.30	254.8	1.	.40	254.8	-3.	.51	229.5	2.	.61	229.5	-3.	.72	196.6	5.	.80	196.6	-2.
		0.25	199.0	-3.	.31	182.1	2.	.41	182.1	-2.	.50	182.1	-5.	.60	166.6	0.	.71	147.9	6.	.81	147.9	[illegible]
		0.5	133.0	-2.	.30	133.0	-2.	.40	128.2	1.	.49	128.2	-1.	.60	122.8	1.	.70	122.8	-2.	.80	114.2	-1.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	71.3	3.	.72	68.1	5.	.81	64.1	2.
	-0.98	0.1	312.5	-2.	.30	312.5	-2.	.40	312.5	-2.	.50	305.6	-0.	.61	305.6	-3.	.73	264.7	4.	.80	264.7	-2.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.80	213.7	-2.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
30.	1.0	0.1	135.4	0.	.30	123.7	2.	.39	123.7	-1.	.47	123.7	-5.	.61	113.7	-2.	.70	102.4	4.	.80	102.4	-0.
		0.25	91.6	2.	.30	91.6	-1.	.38	86.7	3.	.48	86.7	0.	.57	81.8	3.	.69	81.8	-1.	.81	75.1	2.
		0.5	62.2	6.	.29	62.2	5.	.39	59.9	7.	.48	59.9	5.	.57	56.8	8.	.71	52.8	10.	.81	52.8	6.
		1.0	39.0	6.	.30	39.0	4.	.40	39.0	3.	.49	39.0	1.	.58	37.5	3.	.68	37.5	1.	.81	35.6	2.
	0.0	0.1	170.4	-0.	.31	161.9	2.	.42	161.9	-4.	.50	142.9	3.	.60	142.9	-4.	.71	122.5	5.	.79	122.5	-1.
		0.25	119.0	2.	.32	111.5	2.	.41	111.5	-1.	.49	111.5	-3.	.61	103.8	-1.	.71	94.2	5.	.80	94.2	1.
		0.5	89.8	2.	.31	85.7	4.	.40	85.7	2.	.50	85.7	-1.	.60	80.3	2.	.70	74.3	6.	.80	74.3	2.
		1.0	58.1	6.	.31	56.3	7.	.39	56.3	5.	.49	56.3	4.	.60	53.9	5.	.70	53.9	2.	.80	49.5	7.
	-0.98	0.1	222.1	-1.	.30	222.1	-1.	.40	222.1	-1.	.50	222.1	-1.	.60	222.1	-1.	.70	222.1	-2.	.81	201.5	-2.
		0.25	207.8	-4.	.30	207.8	-4.	.40	204.5	-4.	.51	187.7	1.	.60	187.7	-4.	.71	163.7	4.	.80	163.7	-3.
		0.5	143.1	-4.	.30	143.1	-4.	.40	142.1	-3.	.50	142.1	-3.	.61	135.6	1.	.70	135.6	-3.	.80	125.6	-1.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 18

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	412.4	-4.	.30	412.4	-4.	.40	412.4	-4.	.50	412.4	-4.	.60	392.5	-1.	.70	392.5	-5.	.81	346.1	3.
		0.25	273.4	-2.	.30	273.4	-2.	.40	273.4	-2.	.50	273.4	-3.	.60	263.8	-0.	.69	263.8	-2.	.80	239.4	5.
		0.5	164.8	0.	.30	164.8	0.	.40	162.8	1.	.49	162.8	1.	.59	159.1	3.	.72	148.9	6.	.82	148.9	2.
		1.0	69.9	2.	.30	69.9	2.	.39	68.4	4.	.49	68.4	4.	.60	67.2	5.	.70	67.2	4.	.80	65.7	5.
	0.0	0.1	446.5	-4.	.30	446.5	-4.	.40	446.5	-4.	.50	446.5	-4.	.60	446.3	-4.	.70	446.3	-4.	.80	397.4	8.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	296.6	1.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
	-0.98	0.1	446.5	-4.	.30	446.5	-4.	.40	446.5	-4.	.50	446.5	-4.	.60	446.5	-4.	.70	446.5	-4.	.80	443.2	-3.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	310.7	-4.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.60	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
20.	1.0	0.1	316.1	-4.	.30	316.1	-5.	.40	288.2	-0.	.50	288.2	-5.	.60	255.5	2.	.69	255.5	-3.	.80	219.2	5.
		0.25	181.7	3.	.30	181.7	1.	.39	175.3	2.	.49	175.3	-0.	.58	166.6	3.	.69	166.6	-1.	.79	155.3	0.
		0.5	109.8	5.	.29	109.8	4.	.39	106.1	5.	.48	106.1	4.	.58	98.5	8.	.71	89.1	13.	.79	89.1	10.
		1.0	55.8	5.	.30	55.8	3.	.40	54.9	3.	.49	54.9	2.	.60	52.9	4.	.69	52.9	2.	.79	49.5	7.
	0.0	0.1	376.6	-4.	.30	357.6	1.	.40	357.6	-1.	.51	318.6	6.	.61	318.6	1.	.72	267.8	10.	.80	267.8	4.
		0.25	271.6	-3.	.31	245.9	4.	.40	245.9	0.	.50	245.9	-3.	.60	222.8	3.	.70	222.8	-2.	.80	194.2	6.
		0.5	172.9	-1.	.30	166.2	3.	.40	166.2	2.	.49	166.2	-0.	.61	158.7	1.	.70	143.0	7.	.80	143.0	3.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	78.3	2.	.70	78.3	2.	.80	74.6	5.
	-0.98	0.1	445.4	-4.	.30	445.4	-4.	.40	445.4	-4.	.50	445.4	-4.	.59	435.3	-1.	.73	372.8	8.	.80	372.8	4.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	294.1	2.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
30.	1.0	0.1	176.2	8.	.31	160.0	7.	.40	160.0	2.	.49	160.0	-3.	.61	142.0	3.	.70	142.0	-1.	.79	120.0	11.
		0.25	103.2	9.	.29	103.2	5.	.38	97.1	9.	.46	97.1	8.	.63	91.0	10.	.71	82.9	15.	.81	82.9	12.
		0.5	67.7	13.	.30	67.7	9.	.39	65.1	10.	.48	65.1	9.	.59	61.5	11.	.69	61.5	8.	.79	57.0	12.
		1.0	41.7	8.	.30	41.7	5.	.39	41.7	4.	.49	41.7	2.	.60	40.0	5.	.71	38.0	7.	.81	38.0	5.
	0.0	0.1	228.4	6.	.31	215.9	10.	.41	215.9	5.	.51	186.7	13.	.60	186.7	8.	.71	158.4	16.	.79	158.4	11.
		0.25	152.6	6.	.30	152.6	-4.	.41	137.6	2.	.50	137.6	-0.	.59	122.6	8.	.69	122.6	5.	.80	106.5	13.
		0.5	100.8	10.	.31	95.7	11.	.40	95.7	9.	.50	95.7	7.	.60	89.2	11.	.70	89.2	8.	.80	82.0	11.
		1.0	63.0	9.	.31	60.9	8.	.40	60.9	7.	.49	60.9	6.	.60	58.2	8.	.69	58.2	5.	.81	53.3	10.
	-0.98	0.1	307.1	2.	.30	307.1	2.	.40	307.1	2.	.50	307.1	2.	.60	307.1	2.	.69	307.1	2.	.80	275.4	5.
		0.25	285.1	-3.	.30	285.1	-3.	.39	280.0	-1.	.51	254.4	4.	.60	254.4	1.	.69	254.4	-4.	.79	218.5	4.
		0.5	187.0	-2.	.30	187.0	-2.	.40	195.6	-1.	.50	185.6	-1.	.61	176.4	3.	.71	162.6	7.	.80	162.6	3.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 19

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	303.6	-2.	.30	303.6	-2.	.40	303.6	-2.	.50	303.6	-3.	.60	291.8	-1.	.69	291.8	-4.	.79	264.7	-1.
		0.25	221.0	-1.	.30	221.0	-1.	.40	221.0	-1.	.50	215.0	1.	.60	215.0	0.	.70	215.0	-2.	.79	199.2	1.
		0.5	148.8	-1.	.30	148.8	-1.	.40	147.4	-0.	.50	147.4	-0.	.60	144.7	2.	.69	144.7	2.	.79	138.8	3.
		1.0	82.5	4.	.30	82.5	4.	.40	81.0	5.	.51	79.7	5.	.62	79.7	5.	.71	78.1	5.	.81	78.1	2.
	0.0	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	323.9	-3.	.70	294.7	4.	.81	294.7	-3.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.82	235.2	-3.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
	-0.98	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	324.0	-3.	.70	324.0	-3.	.80	322.0	-2.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.80	243.8	-4.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
20.	1.0	0.1	247.0	1.	.30	247.0	-2.	.39	230.1	1.	.49	230.1	-2.	.59	209.7	3.	.70	185.7	9.	.79	185.7	4.
		0.25	160.7	9.	.30	160.7	5.	.40	156.2	6.	.49	156.2	4.	.59	150.1	6.	.70	150.1	2.	.79	141.9	3.
		0.5	117.7	3.	.30	117.7	3.	.39	115.6	3.	.49	115.6	1.	.58	109.3	5.	.70	101.1	9.	.80	101.1	3.
		1.0	67.3	5.	.30	67.3	5.	.40	66.3	5.	.51	64.0	7.	.61	64.0	4.	.70	64.0	3.	.80	60.1	5.
	0.0	0.1	282.5	1.	.31	271.5	2.	.40	271.5	-1.	.50	271.5	-4.	.60	248.5	1.	.71	217.5	7.	.80	217.5	0.
		0.25	219.9	0.	.30	203.5	6.	.40	203.5	3.	.49	203.5	1.	.60	188.2	5.	.70	169.2	10.	.80	169.2	4.
		0.5	154.5	1.	.30	154.5	1.	.39	149.8	4.	.49	149.8	3.	.60	144.4	4.	.69	144.4	2.	.80	135.7	2.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	91.0	1.	.69	91.0	1.	.79	87.3	2.
	-0.99	0.1	323.3	-3.	.30	323.3	-3.	.40	323.3	-3.	.50	317.1	-1.	.60	317.1	-3.	.72	280.2	4.	.80	280.2	-2.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.81	233.8	-3.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
30.	1.0	0.1	156.9	12.	.29	156.9	9.	.39	145.3	12.	.48	145.3	9.	.58	135.2	10.	.70	123.5	12.	.81	123.5	8.
		0.25	113.2	11.	.30	113.2	6.	.40	108.1	8.	.49	108.1	5.	.60	102.8	7.	.69	102.8	4.	.78	95.4	8.
		0.5	80.2	12.	.30	80.2	9.	.40	77.4	11.	.50	73.6	13.	.60	73.6	10.	.70	73.6	8.	.81	63.6	10.
		1.0	50.9	8.	.30	50.9	8.	.39	50.9	7.	.49	50.9	6.	.58	48.8	8.	.70	48.8	5.	.81	46.3	7.
	0.0	0.1	191.9	8.	.30	183.5	12.	.41	183.5	9.	.51	164.1	14.	.61	164.1	8.	.70	144.2	14.	.80	144.2	9.
		0.25	140.6	14.	.31	133.0	15.	.42	133.0	10.	.49	133.0	8.	.61	125.0	9.	.69	125.0	5.	.79	115.8	8.
		0.5	111.3	9.	.31	107.0	9.	.40	107.0	7.	.50	107.0	4.	.59	101.2	7.	.69	101.2	4.	.80	94.5	6.
		1.0	75.2	10.	.30	73.0	10.	.40	73.0	8.	.49	73.0	7.	.60	70.0	8.	.69	70.0	6.	.80	64.5	9.
	-0.99	0.1	241.6	5.	.30	241.6	5.	.40	241.6	5.	.49	241.6	5.	.61	241.6	2.	.71	222.2	5.	.80	222.2	-1.
		0.25	228.2	2.	.30	225.1	2.	.40	225.1	-0.	.50	225.1	-3.	.59	209.0	1.	.70	209.0	-3.	.79	185.3	2.
		0.5	164.3	-4.	.30	164.3	-4.	.40	163.3	-3.	.50	163.3	-3.	.60	157.0	1.	.69	157.0	1.	.80	147.2	3.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 20

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	426.8	-3.	.30	426.8	-3.	.40	426.8	-3.	.50	408.7	1.	.60	408.7	0.	.70	408.7	-3.	.81	366.6	4.
		0.25	299.3	-1.	.30	299.3	-1.	.40	299.3	-1.	.50	299.3	-1.	.60	290.1	2.	.69	290.1	0.	.80	266.4	7.
		0.5	193.2	-1.	.30	193.2	-1.	.40	191.1	0.	.50	191.1	0.	.60	187.3	2.	.70	187.3	2.	.80	173.4	4.
		1.0	89.3	2.	.30	89.3	2.	.40	87.4	4.	.50	85.9	5.	.60	85.8	5.	.70	85.8	4.	.80	83.8	5.
	0.0	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.7	-3.	.69	457.7	-3.	.80	413.2	3.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	321.0	1.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
	-0.98	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.9	-3.	.70	457.9	-3.	.80	454.8	-3.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	334.2	-4.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
20.	1.0	0.1	339.2	-0.	.31	313.2	5.	.40	313.2	2.	.49	313.2	-1.	.59	282.1	5.	.70	282.1	0.	.81	246.3	6.
		0.25	210.0	8.	.30	210.0	5.	.40	203.6	6.	.50	203.6	4.	.59	195.0	6.	.70	195.0	3.	.80	183.5	4.
		0.5	137.0	9.	.30	132.9	9.	.41	132.9	7.	.51	124.1	11.	.62	124.1	9.	.70	113.0	14.	.80	113.0	11.
		1.0	70.8	5.	.30	70.8	5.	.39	69.7	6.	.49	69.7	6.	.59	67.0	8.	.70	62.4	12.	.80	62.4	11.
	0.0	0.1	394.3	-2.	.30	394.3	-2.	.40	377.0	0.	.50	377.0	-3.	.61	341.4	2.	.72	294.0	10.	.80	294.0	5.
		0.25	297.6	0.	.30	272.8	7.	.40	272.8	4.	.49	272.8	2.	.60	249.9	7.	.71	222.2	13.	.80	222.2	9.
		0.5	201.3	2.	.30	201.3	2.	.39	194.6	5.	.50	194.6	3.	.59	187.0	6.	.71	172.4	9.	.81	172.4	4.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	99.8	1.	.70	99.8	1.	.81	95.2	5.
	-0.98	0.1	456.9	-3.	.30	456.9	-3.	.40	456.9	-3.	.50	456.9	-3.	.59	447.4	-1.	.72	390.9	8.	.80	390.9	3.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	318.8	1.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
30.	1.0	0.1	204.6	11.	.30	204.6	9.	.39	188.3	14.	.48	188.3	10.	.57	171.4	14.	.70	171.4	8.	.80	148.3	16.
		0.25	129.5	16.	.30	129.5	12.	.40	122.5	14.	.49	122.5	13.	.60	115.3	15.	.70	105.5	19.	.80	105.5	17.
		0.5	86.4	17.	.29	86.4	15.	.39	83.1	16.	.49	83.1	15.	.58	78.5	17.	.70	72.5	21.	.81	72.5	19.
		1.0	52.2	12.	.30	52.2	10.	.40	52.2	9.	.50	52.2	8.	.59	49.9	12.	.70	47.2	15.	.80	47.2	13.
	0.0	0.1	255.5	8.	.30	255.5	8.	.40	243.1	11.	.51	214.9	17.	.61	214.9	12.	.71	186.6	18.	.80	186.6	13.
		0.25	181.6	12.	.31	166.9	15.	.41	166.9	13.	.50	151.1	17.	.60	151.1	14.	.69	151.1	11.	.80	133.3	17.
		0.5	126.8	16.	.31	120.9	15.	.40	120.9	14.	.50	120.9	12.	.60	113.1	15.	.70	113.1	12.	.79	104.3	16.
		1.0	80.4	11.	.30	77.8	13.	.40	77.8	12.	.49	77.8	10.	.59	74.1	13.	.70	74.1	11.	.80	67.6	16.
	-0.98	0.1	330.9	4.	.30	330.9	4.	.40	330.9	4.	.50	330.9	4.	.60	330.9	4.	.72	301.1	9.	.80	301.1	3.
		0.25	310.3	1.	.30	305.5	3.	.40	305.5	1.	.50	305.5	-1.	.60	281.0	3.	.71	245.7	12.	.80	245.7	6.
		0.5	215.2	-2.	.30	215.2	-2.	.40	213.8	-2.	.50	213.8	-2.	.60	204.8	2.	.69	204.8	2.	.79	190.9	7.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 21

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1 0.25 0.5 1.0	351.7 247.2 162.7 94.7	-2. -2. -1. 2.	.30 .30 .30 .30	351.7 247.2 162.7 94.7	-2. -2. -1. 2.	.40 .40 .40 .40	351.7 247.2 161.1 93.4	-2. -2. -0. 4.	.51 .51 .50 .50	336.3 239.9 161.1 93.4	1. 0. -0. 4.	.63 .62 .60 .60	336.3 239.9 158.0 92.2	-2. -1. 2. 5.	.70 .74 .70 .72	301.4 221.1 150.9 90.4	6. 4. 6. 4.	.80 .83 .79 .81	301.4 221.1 150.9 90.4	1. -2. 3. 1.
	0.0	0.1 0.25 0.5 1.0	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.30 .30 .30 .30	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.40 .40 .40 .40	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.50 .50 .50 .50	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.60 .60 .60 .60	378.0 275.1 180.4 103.0	-2. -3. -4. 0.	.70 .70 .70 .70	340.3 275.1 180.4 103.0	6. -3. -4. 0.	.81 .80 .80 .80	340.3 264.5 180.4 103.0	0. 1. -4. 0.
	-0.98	0.1 0.25 0.5 1.0	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.30 .30 .30 .30	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.40 .40 .40 .40	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.50 .50 .50 .50	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.60 .60 .60 .60	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.70 .70 .70 .70	378.1 275.1 180.4 103.0	-2. -3. -4. 0.	.80 .80 .80 .80	375.5 275.1 180.4 103.0	-1. -3. -4. 0.
20.	1.0	0.1 0.25 0.5 1.0	279.1 176.3 125.6 77.9	-2. 6. 2. 3.	.31 .31 .30 .30	258.3 171.2 125.6 77.9	4. 6. 2. 3.	.43 .42 .40 .41	258.3 171.2 123.1 76.9	-2. 3. 2. 3.	.57 .55 .52 .51	233.6 164.2 117.6 74.3	2. 5. 5. 5.	.57 .67 .63 .63	233.6 164.2 117.6 74.3	2. 1. 4. 2.	.74 .67 .78 .78	205.2 164.2 110.6 69.8	8. 1. 4. 3.	.79 .78 .81 .80	205.2 154.8 110.6 69.8	5. 3. 2. 2.
	0.0	0.1 0.25 0.5 1.0	324.4 245.8 169.3 103.0	-1. -2. -0. 0.	.30 .31 .30 .30	310.1 226.2 163.9 103.0	3. 4. 3. 0.	.42 .43 .41 .40	310.1 226.2 163.9 103.0	-1. 0. 2. 0.	.50 .50 .52 .50	280.9 208.1 157.8 103.0	5. 6. 4. 0.	.60 .60 .59 .60	280.9 208.1 157.8 101.9	0. 3. 3. 1.	.70 .69 .70 .69	280.9 208.1 147.2 101.9	-5. -0. 6. 1.	.79 .80 .81 .82	243.0 186.0 147.2 98.8	4. 5. 1. 1.
	-0.98	0.1 0.25 0.5 1.0	377.2 275.1 180.4 103.0	-2. -3. -4. 0.	.30 .30 .30 .30	377.2 275.1 180.4 103.0	-2. -3. -4. 0.	.40 .40 .40 .40	377.2 275.1 180.4 103.0	-2. -3. -4. 0.	.50 .50 .50 .50	377.2 275.1 180.4 103.0	-2. -3. -4. 0.	.61 .60 .60 .60	369.2 275.1 180.4 103.0	-2. -3. -4. 0.	.69 .70 .70 .70	369.2 275.1 180.4 103.0	-6. -3. -4. 0.	.80 .60 .80 .80	321.6 262.7 180.4 103.0	1. 0. -4. 0.
30.	1.0	0.1 0.25 0.5 1.0	171.9 121.0 92.7 59.5	-1. 3. 1. 2.	.31 .31 .30 .30	158.8 116.6 89.6 59.5	4. 5. 4. 2.	.42 .41 .42 .40	158.8 116.6 89.6 59.5	1. 4. 2. 2.	.55 .54 .53 .51	146.6 112.0 85.3 57.1	5. 4. 4. 5.	.55 .67 .65 .63	146.6 112.0 85.3 57.1	5. 0. 1. 2.	.70 .67 .65 .76	132.5 112.0 85.3 54.4	9. 0. 1. 3.	.80 .79 .79 .79	132.5 105.7 79.5 54.4	4. 1. 3. 2.
	0.0	0.1 0.25 0.5 1.0	212.5 153.2 119.3 87.0	-3. 2. 3. 2.	.30 .31 .31 .30	202.7 143.9 115.6 87.0	1. 7. 4. 2.	.42 .41 .42 .41	202.7 143.9 115.6 84.5	-4. 4. 2. 2.	.51 .51 .50 .53	180.2 134.3 115.6 81.0	4. 8. 0. 4.	.60 .60 .59 .60	180.2 134.3 110.6 81.0	-0. 5. 2. 2.	.70 .69 .71 .69	157.5 134.3 104.9 81.0	8. 1. 4. 0.	.81 .80 .80 .81	157.5 123.3 104.9 74.8	2. 5. 1. 3.
	-0.98	0.1 0.25 0.5 1.0	272.4 256.0 180.4 103.0	-3. -3. -4. 0.	.30 .30 .30 .30	272.4 256.0 180.4 103.0	-3. -3. -4. 0.	.40 .40 .40 .40	272.4 252.1 179.3 103.0	-3. -2. -3. 0.	.50 .52 .50 .50	272.4 232.7 179.3 103.0	-3. 2. -3. 0.	.60 .60 .60 .60	272.4 232.7 172.1 103.0	-3. -1. 1. 0.	.70 .70 .68 .70	248.7 232.7 172.1 103.0	6. -6. 1. 0.	.80 .80 .80 .80	243.7 204.8 160.9 103.0	2. 1. 1. 0.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 22

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	472.3	-3.	.30	472.3	-3.	.40	472.3	-3.	.50	450.3	1.	.62	450.3	-1.	.76	399.7	6.	.78	399.7	5.
		0.25	321.4	-2.	.30	321.4	-2.	.40	321.4	-2.	.50	311.0	1.	.61	311.0	0.	.72	284.4	7.	.79	284.4	5.
		0.5	202.9	0.	.30	202.9	0.	.40	200.6	1.	.50	200.6	1.	.60	196.2	3.	.70	195.2	3.	.79	186.8	8.
		1.0	103.5	2.	.30	103.5	2.	.40	101.3	4.	.50	101.3	4.	.60	99.6	6.	.70	97.5	8.	.78	97.5	6.
	0.0	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	510.0	-3.	.60	509.8	-3.	.70	509.8	-3.	.81	455.7	3.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	340.3	1.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
	-0.98	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	510.0	-3.	.60	510.0	-3.	.70	510.0	-3.	.80	506.3	-2.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	361.5	-3.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.50	116.8	1.	.70	116.8	1.	.80	116.8	1.
20.	1.0	0.1	367.3	-3.	.30	337.3	4.	.43	337.3	-1.	.57	302.0	4.	.57	302.0	4.	.74	262.2	10.	.81	262.2	5.
		0.25	222.6	5.	.31	215.1	6.	.42	215.1	4.	.54	205.0	5.	.54	205.0	5.	.67	205.0	2.	.81	191.8	3.
		0.5	154.3	2.	.30	154.3	2.	.41	151.0	3.	.53	142.0	5.	.55	142.0	2.	.72	129.7	9.	.80	129.7	5.
		1.0	83.3	3.	.30	82.2	4.	.41	82.2	3.	.51	79.2	6.	.62	79.2	5.	.75	74.2	8.	.81	74.2	7.
	0.0	0.1	432.9	-3.	.30	412.1	2.	.40	412.1	-0.	.51	370.0	6.	.51	370.0	1.	.71	315.4	11.	.80	315.4	5.
		0.25	319.5	-2.	.31	291.6	4.	.40	291.6	2.	.49	291.6	-1.	.60	266.2	4.	.70	235.8	12.	.81	235.8	7.
		0.5	212.3	0.	.30	204.6	4.	.39	204.6	3.	.48	204.6	2.	.59	195.8	4.	.70	195.8	2.	.81	152.0	4.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	115.1	2.	.70	115.1	2.	.81	109.9	5.
	-0.98	0.1	508.8	-3.	.30	508.8	-3.	.40	508.8	-3.	.50	508.8	-3.	.59	497.5	-1.	.73	428.8	9.	.79	428.8	5.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	343.7	2.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.50	116.8	1.	.70	115.8	1.	.80	116.8	1.
30.	1.0	0.1	216.2	2.	.32	197.3	4.	.45	197.3	-1.	.45	197.3	-1.	.59	181.2	4.	.75	163.1	8.	.80	163.1	6.
		0.25	148.1	1.	.31	140.2	5.	.42	140.2	3.	.54	132.2	6.	.57	132.2	2.	.67	132.2	2.	.79	121.3	6.
		0.5	100.3	6.	.30	96.6	8.	.41	96.6	7.	.53	91.6	10.	.65	91.6	7.	.73	85.1	11.	.81	85.1	9.
		1.0	62.9	5.	.31	62.9	4.	.41	62.9	2.	.53	60.4	5.	.65	60.4	3.	.77	57.4	5.	.80	57.4	4.
	0.0	0.1	272.4	1.	.30	258.7	5.	.41	258.7	1.	.51	227.9	8.	.61	227.9	3.	.70	195.4	12.	.81	195.4	7.
		0.25	189.7	3.	.32	177.6	5.	.40	177.6	3.	.49	177.6	1.	.60	165.3	4.	.70	151.3	9.	.80	151.3	5.
		0.5	145.1	1.	.30	138.4	5.	.40	138.4	3.	.50	138.4	0.	.60	129.8	4.	.69	129.8	1.	.80	120.0	5.
		1.0	93.7	5.	.30	90.8	7.	.40	90.8	5.	.49	90.8	4.	.60	86.8	7.	.70	86.8	4.	.79	79.8	9.
	-0.98	0.1	357.6	-0.	.30	357.6	-0.	.40	357.6	-0.	.50	357.6	-0.	.50	357.6	-0.	.69	357.6	-3.	.80	323.5	6.
		0.25	334.0	-3.	.30	328.5	-1.	.39	326.5	-1.	.50	300.8	5.	.60	300.8	1.	.69	300.8	-3.	.80	261.6	4.
		0.5	228.1	-2.	.30	228.1	-2.	.40	226.6	-2.	.50	226.6	-2.	.50	216.5	3.	.70	216.5	2.	.80	200.3	5.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 23

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	369.8	-1.	.30	369.8	-1.	.40	369.8	-1.	.51	356.3	1.	.62	356.3	-0.	.75	324.8	5.	.79	324.8	2.
		0.25	274.6	-1.	.30	274.6	-1.	.40	274.6	-1.	.50	267.7	2.	.61	267.7	0.	.72	249.3	6.	.79	249.3	3.
		0.5	189.5	-0.	.30	189.5	-0.	.40	187.8	1.	.50	187.8	1.	.60	184.5	2.	.70	184.5	2.	.80	177.4	6.
		1.0	118.3	-0.	.30	118.3	-0.	.40	116.8	1.	.50	116.8	1.	.60	115.5	2.	.70	115.5	2.	.60	113.9	2.
	0.0	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	392.9	-2.	.70	392.9	-3.	.79	359.6	2.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	291.0	0.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
	-0.98	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	393.0	-2.	.70	393.0	-2.	.80	393.6	-1.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	300.9	-3.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
20.	1.0	0.1	304.6	3.	.31	285.2	6.	.43	285.2	3.	.43	285.2	3.	.56	261.5	7.	.70	233.5	13.	.80	233.5	8.
		0.25	203.8	10.	.31	198.5	10.	.42	195.5	8.	.54	191.1	9.	.66	191.1	7.	.77	181.2	8.	.78	181.2	7.
		0.5	151.7	5.	.30	149.0	6.	.41	149.0	5.	.52	143.2	8.	.62	143.2	6.	.76	135.7	7.	.80	135.7	6.
		1.0	100.1	3.	.30	98.8	4.	.40	98.8	3.	.51	95.8	5.	.63	95.8	3.	.76	90.4	5.	.80	90.4	3.
	0.0	0.1	345.5	3.	.31	332.6	4.	.41	332.6	2.	.50	332.6	-1.	.60	306.3	3.	.70	270.6	11.	.81	270.6	5.
		0.25	273.3	2.	.30	254.3	8.	.40	254.3	5.	.50	254.3	3.	.59	236.4	8.	.70	236.4	5.	.80	213.9	9.
		0.5	196.4	2.	.30	196.4	2.	.39	190.7	5.	.49	190.7	5.	.59	184.2	6.	.69	184.2	5.	.81	173.7	5.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	126.3	-1.	.70	126.3	-1.	.80	122.9	2.
	-0.98	0.1	392.2	-2.	.30	392.2	-2.	.40	392.2	-2.	.50	392.2	-2.	.60	385.3	-2.	.70	343.0	6.	.61	343.0	-1.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	299.4	1.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
30.	1.0	0.1	199.2	15.	.31	185.4	19.	.43	185.4	15.	.57	173.1	16.	.57	173.1	16.	.74	158.8	16.	.60	158.8	14.
		0.25	146.8	14.	.31	142.1	13.	.43	142.1	11.	.56	137.2	10.	.56	137.2	10.	.70	130.4	11.	.81	130.4	3.
		0.5	116.0	7.	.31	113.3	7.	.42	113.3	6.	.54	108.4	7.	.65	108.4	6.	.72	101.9	10.	.80	101.9	7.
		1.0	77.7	9.	.31	77.7	6.	.41	77.7	5.	.53	74.8	7.	.65	74.8	5.	.65	74.8	5.	.79	71.3	6.
	0.0	0.1	240.8	11.	.30	240.8	11.	.40	230.9	13.	.50	207.9	18.	.61	207.9	13.	.71	183.9	18.	.79	183.9	14.
		0.25	179.6	17.	.31	170.3	18.	.41	170.3	15.	.50	170.3	13.	.59	160.6	15.	.70	149.2	17.	.79	149.2	14.
		0.5	145.0	12.	.31	141.0	11.	.41	141.0	9.	.49	141.0	7.	.59	135.7	8.	.69	135.7	6.	.81	129.5	7.
		1.0	110.4	4.	.30	110.4	4.	.39	107.6	6.	.49	107.6	4.	.60	103.6	6.	.67	103.6	5.	.79	96.4	7.
	-0.99	0.1	298.4	8.	.30	298.4	8.	.40	298.4	8.	.50	298.4	9.	.61	298.4	5.	.69	298.4	2.	.80	276.0	3.
		0.25	283.0	3.	.30	283.0	3.	.40	279.3	2.	.50	279.3	-0.	.59	260.7	4.	.69	260.7	0.	.81	233.0	5.
		0.5	208.1	-3.	.30	208.1	-3.	.40	206.9	-2.	.50	206.9	-2.	.60	199.4	1.	.69	199.4	1.	.81	187.6	5.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.

PREDICTED CAPACITIES AND ERRORS USING GRAPHICAL MOMENT MAGNIFICATION METHOD - COLUMN 24

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR	P_S/P	P_{GR}	ERR
10.	1.0	0.1	492.2	-2.	.30	492.2	-2.	.40	492.2	-2.	.50	472.8	2.	.61	472.8	0.	.73	427.3	7.	.80	427.3	4.
		0.25	354.7	-1.	.30	354.7	-1.	.40	354.7	-1.	.50	354.7	-1.	.60	344.8	2.	.71	318.9	8.	.79	318.9	6.
		0.5	236.9	0.	.30	236.9	0.	.40	234.5	1.	.50	234.5	1.	.60	230.2	3.	.70	230.2	3.	.80	225.6	7.
		1.0	132.2	4.	.30	132.2	4.	.40	129.7	5.	.51	127.6	6.	.61	127.6	5.	.72	125.0	6.	.81	125.0	5.
	0.0	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.3	-3.	.69	526.3	-3.	.80	477.7	4.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	378.2	1.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
	-0.96	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.5	-3.	.70	526.5	-3.	.80	523.1	-2.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	392.4	-3.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
20.	1.0	0.1	397.8	2.	.31	369.8	6.	.43	369.8	2.	.55	336.0	8.	.55	336.0	8.	.70	296.8	14.	.79	296.8	10.
		0.25	256.1	10.	.31	248.8	10.	.42	248.8	8.	.54	238.9	9.	.66	238.9	7.	.66	238.9	7.	.80	225.8	7.
		0.5	187.0	4.	.30	183.5	6.	.40	183.5	5.	.52	175.4	8.	.63	175.4	6.	.77	162.1	9.	.81	162.1	7.
		1.0	107.6	5.	.30	107.6	5.	.40	106.1	5.	.51	102.4	7.	.62	102.4	6.	.74	96.1	9.	.79	96.1	3.
	0.0	0.1	457.2	0.	.30	438.6	4.	.40	438.6	1.	.50	438.6	-2.	.60	400.2	4.	.71	348.9	12.	.80	348.9	6.
		0.25	352.9	1.	.30	325.9	7.	.40	325.9	5.	.49	325.9	3.	.60	300.8	8.	.70	269.8	15.	.81	269.8	10.
		0.5	246.1	3.	.30	246.1	3.	.39	238.5	6.	.49	233.5	5.	.59	229.8	7.	.70	229.8	5.	.80	215.8	8.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	145.7	1.	.70	145.7	1.	.80	139.8	5.
	-0.96	0.1	525.3	-3.	.30	525.3	-3.	.40	525.3	-3.	.50	525.3	-3.	.59	514.9	-1.	.72	453.5	8.	.80	453.5	4.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	375.8	1.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
30.	1.0	0.1	249.9	13.	.31	231.3	18.	.43	231.3	14.	.57	215.0	15.	.57	215.0	15.	.74	196.2	16.	.79	196.2	14.
		0.25	180.6	11.	.31	173.5	11.	.44	173.5	8.	.56	164.9	10.	.56	164.9	10.	.69	164.9	6.	.79	152.3	11.
		0.5	128.4	13.	.31	124.0	13.	.41	124.0	11.	.54	117.9	13.	.67	117.9	11.	.74	109.8	15.	.81	109.3	13.
		1.0	81.4	9.	.30	81.4	9.	.40	81.4	9.	.51	78.1	10.	.62	78.1	9.	.75	74.2	11.	.80	74.2	10.
	0.0	0.1	306.9	9.	.30	293.2	13.	.39	293.2	12.	.51	261.6	17.	.61	261.6	13.	.71	229.4	19.	.80	229.4	14.
		0.25	223.6	15.	.31	211.3	16.	.40	211.3	14.	.50	211.3	11.	.60	198.6	13.	.69	198.6	9.	.80	183.8	12.
		0.5	173.4	9.	.31	171.6	9.	.41	171.6	7.	.49	171.6	6.	.60	162.2	8.	.69	162.2	6.	.79	151.4	10.
		1.0	120.4	9.	.31	116.8	10.	.40	116.8	9.	.49	116.8	8.	.60	111.9	10.	.69	111.9	8.	.80	103.2	13.
	-0.96	0.1	388.8	5.	.30	388.8	5.	.40	388.8	5.	.50	388.8	5.	.60	388.8	5.	.72	356.7	9.	.80	356.7	5.
		0.25	366.7	2.	.30	361.4	4.	.40	361.4	2.	.50	361.4	-1.	.59	334.9	5.	.70	296.1	12.	.81	296.1	7.
		0.5	261.9	-2.	.30	261.9	-2.	.40	260.3	-2.	.50	260.3	-2.	.60	250.1	2.	.70	250.1	2.	.80	234.3	8.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.

APPENDIX F

COLUMN CAPACITIES AND ASSOCIATED ERRORS OF THE ACI MOMENT MAGNIFICATION METHOD

Tables F1 to F24 give values of column capacities predicted by the ACI Moment Magnifier Method, P_{ACI}. EI was calculated by the preferred equation (Eqn. 6.6). Capacity reduction factors were not included. The tables also give associated errors calculated by comparing predicted capacities with those of the analytical method (Appendix C) by using Eqn. 5.5.

The following notation is used in the tables:

P_{ACI}	column capacity (kips) predicted by the ACI Moment Magnifier Method with EI from Eqn. 6.6 and capacity reduction factors excluded
ERR	Error, as a percentage, calculated by Eqn. 5.5
P_S/P_{AN}	ratio of sustained load to ultimate load (P_{sus}/P_{an} in text)
E/H	ratio of eccentricity to section depth (e/h in text)
E_1/E_2	ratio of end eccentricities (e_1/e_2 in text)
L/H	ratio of column length to section depth (L/h in text)

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 1

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	213.5	-5.	.30	206.5	-1.	.40	203.9	0.	.50	201.5	0.	.60	198.8	-4.	.70	196.3	-8.	.78	194.1	-15.
		0.25	140.3	-6.	.30	135.0	-2.	.40	133.3	-1.	.50	131.7	-1.	.59	130.0	-2.	.76	127.4	-11.	.79	126.9	-13.
		0.5	70.0	-8.	.31	67.1	-6.	.43	66.0	-6.	.51	65.3	-7.	.52	64.3	-9.	.69	63.7	-10.	.80	62.8	-12.
		1.0	23.9	-11.	.29	23.6	-11.	.40	23.5	-12.	.51	23.4	-13.	.60	23.3	-14.	.70	23.2	-13.	.81	23.1	-14.
	0.0	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	230.7	-4.	.60	228.3	-3.	.68	226.2	-5.	.79	223.3	-13.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.73	159.3	-6.	.78	159.3	-7.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
	-0.98	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	232.7	-5.	.60	232.7	-5.	.70	232.7	-5.	.80	232.7	-5.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.50	159.3	-6.	.70	159.3	-6.	.80	159.3	-6.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
20.	1.0	0.1	138.5	13.	.32	115.4	21.	.41	109.1	21.	.52	102.8	20.	.66	96.1	17.	.70	94.1	16.	.83	88.4	11.
		0.25	92.7	-1.	.31	79.3	6.	.43	75.2	6.	.55	71.3	5.	.61	69.4	4.	.69	67.1	1.	.79	64.4	-2.
		0.5	49.6	-11.	.33	44.4	-8.	.41	43.3	-8.	.52	41.9	-9.	.54	40.6	-10.	.69	39.9	-11.	.79	39.0	-11.
		1.0	21.3	-14.	.30	20.4	-15.	.41	20.1	-17.	.50	19.9	-17.	.61	19.6	-17.	.70	19.4	-18.	.80	19.1	-18.
	0.0	0.1	157.1	16.	.31	129.2	29.	.42	121.2	30.	.47	117.2	30.	.58	110.1	29.	.70	103.4	25.	.81	97.7	21.
		0.25	121.2	10.	.33	100.7	18.	.42	96.1	19.	.51	91.6	18.	.61	87.3	17.	.70	83.5	15.	.80	80.0	11.
		0.5	80.8	-5.	.32	69.9	2.	.41	67.3	2.	.50	64.8	3.	.51	62.1	2.	.70	59.8	1.	.81	57.4	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.61	25.0	-3.	.71	25.0	-4.	.80	25.0	-5.
	-0.98	0.1	169.1	23.	.30	137.5	38.	.40	129.2	42.	.50	121.8	45.	.60	114.6	47.	.68	109.7	46.	.81	102.6	43.
		0.25	138.5	8.	.30	116.4	22.	.40	109.9	27.	.50	104.1	31.	.60	98.8	34.	.70	94.0	37.	.81	89.3	36.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.50	78.1	1.	.70	74.7	5.	.80	71.7	9.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
30.	1.0	0.1	74.0	31.	.31	57.9	35.	.40	54.6	33.	.53	50.6	32.	.63	47.6	30.	.69	46.0	29.	.83	42.9	26.
		0.25	54.7	1.	.33	44.3	7.	.43	41.7	7.	.55	39.2	8.	.57	37.1	5.	.71	36.4	8.	.80	35.0	7.
		0.5	34.8	-14.	.31	30.1	-11.	.42	28.9	-9.	.51	27.9	-9.	.53	26.7	-9.	.71	26.0	-8.	.80	25.1	-9.
		1.0	18.2	-17.	.32	16.8	-18.	.39	16.5	-18.	.51	16.1	-17.	.59	15.8	-17.	.71	15.4	-18.	.80	15.1	-18.
	0.0	0.1	80.3	41.	.28	63.8	49.	.41	58.4	48.	.51	54.6	48.	.59	52.1	46.	.72	48.3	43.	.83	45.5	40.
		0.25	66.8	24.	.32	52.8	27.	.38	50.7	27.	.50	47.3	26.	.61	44.6	26.	.71	42.3	25.	.79	40.5	24.
		0.5	49.7	3.	.29	41.7	8.	.39	39.4	9.	.51	37.2	10.	.61	35.5	10.	.70	34.1	10.	.79	32.7	9.
		1.0	25.0	-8.	.32	25.0	-15.	.40	25.0	-16.	.50	24.6	-17.	.60	23.8	-16.	.69	23.1	-14.	.80	22.4	-13.
	-0.98	0.1	83.7	52.	.30	65.2	63.	.40	60.7	65.	.51	56.4	66.	.51	52.9	67.	.69	50.7	66.	.80	47.8	64.
		0.25	74.0	49.	.31	58.1	59.	.41	54.2	60.	.51	51.2	60.	.52	47.8	59.	.70	45.8	58.	.81	43.3	57.
		0.5	60.4	24.	.30	49.0	38.	.40	46.2	42.	.50	43.6	45.	.63	40.8	46.	.72	39.1	46.	.80	37.6	45.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 2

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	323.2	-1.	.30	306.5	5.	.40	300.7	6.	.50	294.9	8.	.60	289.2	8.	.70	283.2	6.	.82	276.2	1.
		0.25	203.3	-1.	.30	192.5	4.	.40	188.9	6.	.50	184.9	8.	.61	180.5	6.	.71	176.5	3.	.80	173.3	-1.
		0.5	85.6	-10.	.31	81.3	-8.	.41	80.1	-8.	.51	78.9	-8.	.61	77.7	-9.	.70	76.7	-10.	.80	75.6	-10.
		1.0	26.9	-14.	.31	26.6	-17.	.40	26.5	-18.	.51	26.3	-18.	.61	26.2	-18.	.72	26.1	-19.	.79	26.0	-20.
	0.0	0.1	367.4	-5.	.30	354.7	-2.	.40	348.9	0.	.50	342.9	2.	.60	336.6	4.	.69	330.7	5.	.81	322.9	2.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	243.9	-5.	.70	239.0	-3.	.80	234.2	-1.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
	-0.98	0.1	367.4	-5.	.30	367.4	-5.	.40	367.4	-5.	.50	367.4	-5.	.60	366.6	-5.	.70	360.1	-3.	.80	353.3	-1.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	244.2	-5.	.80	244.2	-5.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
20.	1.0	0.1	176.2	29.	.31	141.7	40.	.41	133.2	41.	.51	125.4	41.	.53	117.4	40.	.70	113.2	39.	.80	107.8	37.
		0.25	115.2	11.	.32	95.9	18.	.43	90.5	19.	.54	85.7	20.	.67	80.9	19.	.71	79.5	18.	.80	76.5	16.
		0.5	58.5	-11.	.32	52.2	-10.	.41	50.7	-9.	.51	49.1	-9.	.62	47.5	-9.	.69	46.6	-10.	.78	45.5	-10.
		1.0	24.0	-20.	.30	23.0	-21.	.40	22.8	-22.	.50	22.5	-22.	.51	22.2	-23.	.68	22.0	-22.	.81	21.6	-23.
	0.0	0.1	198.3	33.	.30	158.4	46.	.40	148.4	48.	.50	139.0	49.	.52	129.7	48.	.70	124.3	47.	.80	118.1	45.
		0.25	152.6	26.	.30	124.9	36.	.42	117.0	37.	.49	112.1	37.	.60	105.9	37.	.70	100.7	36.	.79	96.3	34.
		0.5	100.0	-3.	.31	84.5	8.	.41	80.7	10.	.50	77.3	11.	.60	74.2	11.	.70	71.2	11.	.80	65.6	10.
		1.0	28.1	-1.	.30	28.1	-2.	.40	28.1	-3.	.52	28.1	-4.	.52	28.1	-5.	.70	28.1	-6.	.80	28.1	-7.
	-0.98	0.1	210.9	39.	.30	167.2	52.	.40	156.1	55.	.50	146.4	58.	.59	138.7	60.	.73	128.0	61.	.81	122.8	60.
		0.25	176.2	24.	.30	142.5	39.	.40	133.9	43.	.50	126.2	46.	.60	119.3	49.	.70	113.2	51.	.80	107.6	54.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	98.8	4.	.60	94.0	9.	.70	89.7	13.	.80	85.7	17.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
30.	1.0	0.1	88.0	47.	.31	69.1	53.	.40	64.6	53.	.51	60.4	52.	.61	56.9	51.	.71	53.9	50.	.79	51.7	49.
		0.25	64.6	10.	.31	52.6	13.	.42	49.4	15.	.53	46.7	16.	.64	44.2	17.	.70	43.0	17.	.79	41.3	17.
		0.5	40.5	-14.	.32	34.9	-13.	.42	33.6	-12.	.51	32.4	-10.	.63	30.9	-8.	.71	30.1	-9.	.80	29.2	-5.
		1.0	20.6	-23.	.31	19.1	-25.	.43	18.6	-24.	.51	16.3	-24.	.60	17.9	-23.	.70	17.6	-24.	.80	17.2	-23.
	0.0	0.1	95.6	55.	.30	74.8	63.	.42	68.5	63.	.51	64.6	63.	.61	60.7	62.	.72	57.1	61.	.81	54.3	66.
		0.25	79.5	40.	.31	63.1	44.	.40	59.5	44.	.50	55.8	43.	.60	52.8	43.	.71	49.9	42.	.80	47.7	40.
		0.5	58.7	11.	.32	48.0	14.	.42	45.6	15.	.50	43.4	16.	.60	41.7	17.	.70	39.9	17.	.81	37.0	16.
		1.0	28.1	-11.	.32	28.1	-18.	.40	28.1	-20.	.50	28.1	-22.	.59	27.6	-21.	.71	26.7	-20.	.80	25.3	-19.
	-0.98	0.1	99.6	63.	.30	77.3	71.	.40	71.9	73.	.49	67.7	75.	.60	63.1	76.	.69	59.8	76.	.81	56.2	75.
		0.25	88.0	61.	.30	69.3	69.	.40	64.6	70.	.50	60.7	71.	.60	57.2	71.	.71	54.0	70.	.80	51.4	69.
		0.5	71.7	30.	.30	57.9	44.	.40	54.5	47.	.50	51.5	50.	.62	48.3	52.	.71	46.2	52.	.80	44.2	52.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 3

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR
10.	1.0	0.1 0.25 0.5 1.0	222.5 153.7 81.9 28.9	-6. -7. -6. -9.	.30 .30 .31 .30	217.5 149.2 79.1 28.5	-4. -4. -4. -8.	.40 .40 .41 .40	215.7 147.8 78.2 28.4	-3. -3. -4. -7.	.50 .50 .51 .50	213.8 146.3 77.4 28.3	-3. -2. -5. -7.	.60 .59 .61 .61	212.0 144.9 76.6 28.1	-5. -1. -6. -7.	.69 .72 .69 .69	210.4 143.1 75.0 28.0	-9. -8. -8. -7.	.80 .79 .79 .81	208.2 142.2 75.1 27.9	-18. -12. -10. -7.
	0.0	0.1 0.25 0.5 1.0	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.30 .30 .30 .30	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.40 .40 .40 .40	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.50 .50 .50 .50	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.60 .60 .60 .60	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.72 .70 .70 .70	236.3 168.8 92.0 30.2	-10. -5. -2. 0.	.80 .80 .80 .80	235.5 168.8 92.0 30.2	-17. -5. -2. 0.
	-0.98	0.1 0.25 0.5 1.0	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.30 .30 .30 .30	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.40 .40 .40 .40	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.50 .50 .50 .50	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.60 .60 .60 .60	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.70 .70 .70 .70	236.3 168.8 92.0 30.2	-5. -5. -2. 0.	.80 .80 .80 .80	236.3 168.8 92.0 30.2	-5. -5. -2. 0.
20.	1.0	0.1 0.25 0.5 1.0	162.3 110.0 61.1 25.6	3. -3. -7. -13.	.30 .30 .31 .30	140.1 96.4 55.3 24.5	12. 5. -5. -8.	.40 .40 .42 .40	133.6 92.4 53.6 24.2	12. 6. -5. -8.	.51 .52 .53 .49	126.5 87.9 52.0 23.9	12. 4. -5. -7.	.62 .65 .63 .59	120.2 83.7 50.5 23.6	10. 2. -6. -7.	.71 .70 .70 .71	115.3 82.2 49.6 23.2	6. -0. -7. -8.	.79 .80 .80 .80	110.9 79.0 48.4 22.9	4. -4. -9. -8.
	0.0	0.1 0.25 0.5 1.0	184.8 142.0 92.0 30.2	5. 3. -3. 0.	.31 .29 .29 .30	156.6 123.5 86.0 30.2	18. 12. 1. 0.	.41 .40 .39 .40	148.0 117.2 82.6 30.2	19. 13. 2. 0.	.51 .50 .50 .50	140.7 112.3 79.4 30.2	18. 13. 3. 0.	.62 .62 .61 .60	133.0 106.4 76.2 30.2	15. 11. 2. 0.	.72 .71 .71 .70	126.7 102.0 73.4 30.2	12. 9. -1. 0.	.81 .80 .80 .80	121.7 93.5 71.3 30.2	9. 5. -3. 0.
	-0.98	0.1 0.25 0.5 1.0	199.8 162.3 92.0 30.2	11. -1. -2. 0.	.30 .30 .30 .30	167.7 140.3 92.0 30.2	25. 12. -2. 0.	.40 .40 .40 .40	158.5 133.7 92.0 30.2	30. 16. -2. 0.	.50 .50 .50 .50	150.0 127.2 92.0 30.2	33. 21. -2. 0.	.61 .60 .60 .60	141.3 121.2 92.0 30.2	35. 24. -2. 0.	.69 .70 .70 .70	135.6 115.7 91.6 30.2	34. 28. -2. 0.	.80 .80 .80 .80	128.7 110.6 83.1 30.2	32. 29. 2. 0.
30.	1.0	0.1 0.25 0.5 1.0	92.0 68.1 43.4 21.7	25. 5. -10. -14.	.33 .32 .31 .30	71.7 55.6 37.6 20.2	30. 10. -2. -9.	.45 .43 .41 .40	66.7 52.5 36.1 19.7	29. 12. -2. -8.	.51 .55 .52 .49	64.4 49.3 34.5 19.3	29. 13. 0. -6.	.58 .61 .54 .58	61.6 47.8 33.1 19.0	28. 12. -0. -6.	.73 .69 .69 .71	56.9 46.2 32.4 18.4	26. 12. 0. -5.	.79 .80 .79 .80	54.9 43.8 31.4 18.1	25. 10. -1. -5.
	0.0	0.1 0.25 0.5 1.0	100.3 83.0 61.9 30.2	32. 21. 7. -5.	.28 .27 .28 .28	80.0 68.2 52.5 30.2	41. 25. 13. -6.	.42 .43 .40 .39	72.6 62.1 49.0 30.2	41. 26. 14. -8.	.51 .50 .50 .49	68.5 59.3 46.6 30.2	40. 26. 14. -9.	.61 .61 .61 .60	64.5 56.1 44.5 29.5	39. 26. 14. -8.	.69 .72 .71 .69	61.7 52.9 42.4 28.6	37. 25. 13. -7.	.78 .80 .82 .79	58.8 50.7 40.6 27.7	35. 23. 12. -6.
	-0.98	0.1 0.25 0.5 1.0	104.9 92.0 75.1 30.2	44. 41. 17. 0.	.31 .31 .30 .30	81.5 72.9 61.4 30.2	55. 52. 32. 0.	.42 .41 .40 .40	75.6 68.4 57.9 30.2	58. 54. 36. 0.	.51 .50 .50 .50	71.3 64.5 54.8 30.2	59. 54. 39. 0.	.61 .61 .60 .60	66.9 60.8 52.0 30.2	59. 54. 42. 0.	.69 .73 .73 .70	63.8 56.9 48.8 30.2	58. 53. 43. 0.	.81 .80 .81 .80	59.8 54.7 46.9 30.2	56. 52. 41. 0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 4

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	337.4	-3.	.30	324.8	0.	.40	320.4	2.	.50	315.9	3.	.61	311.0	3.	.69	307.1	2.	.82	301.2	-3.
		0.25	222.0	-3.	.30	212.4	2.	.40	208.7	3.	.50	205.0	5.	.61	200.9	4.	.70	197.8	2.	.81	194.0	-3.
		0.5	100.8	-8.	.30	96.5	-5.	.41	95.1	-6.	.50	93.8	-6.	.60	92.6	-6.	.70	91.4	-8.	.80	90.2	-9.
		1.0	30.1	-8.	.30	29.8	-7.	.40	29.6	-8.	.51	29.5	-7.	.60	29.4	-7.	.71	29.3	-8.	.80	29.2	-7.
	0.0	0.1	370.8	-5.	.30	370.0	-5.	.40	366.0	-4.	.50	361.8	-2.	.60	357.3	-1.	.69	353.1	-0.	.80	347.9	-3.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	255.7	-5.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
	-0.98	0.1	370.8	-5.	.30	370.8	-5.	.40	370.8	-5.	.50	370.8	-5.	.60	370.8	-5.	.70	370.8	-5.	.80	370.8	-5.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	255.7	-5.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
20.	1.0	0.1	207.7	19.	.29	171.2	31.	.39	161.8	33.	.48	153.8	33.	.62	142.6	33.	.70	136.8	32.	.80	130.3	30.
		0.25	135.9	10.	.30	115.7	17.	.41	109.8	19.	.51	104.7	19.	.60	100.8	19.	.70	96.5	18.	.80	92.7	15.
		0.5	70.4	-8.	.29	63.4	-3.	.39	61.4	-2.	.49	59.5	-2.	.60	57.5	-2.	.70	55.9	-2.	.80	54.3	-2.
		1.0	26.9	-12.	.30	25.8	-10.	.41	25.5	-10.	.51	25.1	-8.	.61	24.8	-8.	.70	24.5	-8.	.79	24.3	-7.
	0.0	0.1	234.3	22.	.30	190.3	37.	.40	178.8	39.	.50	167.9	40.	.62	157.2	40.	.70	150.5	39.	.81	141.9	36.
		0.25	179.4	18.	.31	148.3	30.	.41	140.8	31.	.50	134.2	32.	.60	127.2	32.	.72	120.4	31.	.81	115.3	28.
		0.5	118.6	-4.	.31	101.7	8.	.40	97.4	9.	.50	93.5	11.	.60	89.8	12.	.71	85.8	11.	.80	82.9	10.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
	-0.98	0.1	250.7	29.	.30	201.6	43.	.40	188.6	46.	.50	177.2	50.	.59	167.8	52.	.73	155.5	53.	.80	150.0	53.
		0.25	207.7	15.	.30	170.5	30.	.40	160.6	34.	.50	151.7	39.	.60	143.8	41.	.70	130.6	44.	.80	130.0	47.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	113.2	3.	.70	108.2	8.	.80	103.6	11.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
30.	1.0	0.1	106.9	41.	.29	84.9	47.	.37	80.4	47.	.47	75.7	47.	.59	70.1	47.	.74	64.7	46.	.81	62.5	45.
		0.25	78.7	14.	.30	64.5	20.	.39	61.0	21.	.50	57.7	23.	.61	54.5	24.	.70	52.1	24.	.80	49.8	23.
		0.5	48.5	-9.	.30	41.9	-2.	.40	40.2	-0.	.49	38.7	2.	.61	37.0	4.	.72	35.6	4.	.81	34.5	4.
		1.0	23.1	-14.	.31	21.4	-11.	.40	21.0	-9.	.51	20.5	-8.	.60	20.2	-8.	.70	19.8	-7.	.81	19.4	-6.
	0.0	0.1	116.2	48.	.33	89.2	57.	.42	83.7	57.	.51	79.1	57.	.59	75.1	57.	.73	69.4	56.	.80	66.8	55.
		0.25	96.5	36.	.28	77.9	42.	.39	72.6	42.	.50	68.2	42.	.61	64.2	42.	.72	60.5	42.	.80	58.1	41.
		0.5	71.2	14.	.29	59.2	20.	.40	55.8	22.	.49	53.2	23.	.60	50.5	23.	.71	48.1	24.	.81	46.0	23.
		1.0	31.5	-5.	.30	31.5	-6.	.39	31.5	-7.	.49	31.5	-8.	.59	31.5	-9.	.69	31.4	-9.	.80	30.3	-6.
	-0.98	0.1	121.2	57.	.30	94.2	67.	.40	87.8	69.	.51	81.8	71.	.61	76.6	71.	.70	72.9	71.	.82	68.2	70.
		0.25	100.9	55.	.30	84.5	64.	.40	79.0	66.	.50	74.2	67.	.61	69.5	67.	.70	66.1	67.	.79	62.4	66.
		0.5	87.1	26.	.30	70.5	40.	.40	66.3	43.	.50	62.6	46.	.60	59.3	49.	.71	56.2	51.	.80	53.6	51.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.50	31.5	1.	.70	31.5	1.	.80	31.5	1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 5

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1 0.25 0.5 1.0	259.7 179.3 114.9 50.0	-6. -7. -5. -4.	.30 .30 .30 .30	254.0 174.6 111.6 49.2	-4. -4. -2. -2.	.40 .40 .40 .40	252.1 173.1 110.6 49.0	-3. -3. -1. -2.	.50 .49 .51 .51	250.1 171.6 109.5 48.7	-4. -2. -1. -3.	.60 .61 .60 .60	248.0 169.9 108.5 48.5	-6. -3. -2. -3.	.71 .70 .74 .70	245.6 168.4 107.1 48.2	-12. -5. -8. -4.	.79 .82 .78 .79	243.9 166.7 106.7 48.0	-18. -14. -10. -4.
	0.0	0.1 0.25 0.5 1.0	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.30 .30 .30 .30	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.40 .40 .40 .40	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.50 .50 .50 .50	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.60 .60 .60 .60	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.69 .70 .70 .70	275.6 195.4 124.6 52.9	-8. -5. -5. 0.	.80 .79 .80 .80	275.6 195.4 124.6 52.9	-17. -6. -5. 0.
	-0.98	0.1 0.25 0.5 1.0	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.30 .30 .30 .30	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.40 .40 .40 .40	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.50 .50 .50 .50	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.60 .60 .60 .60	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.70 .70 .70 .70	275.6 195.4 124.6 52.9	-4. -5. -5. 0.	.80 .80 .80 .80	275.6 195.4 124.6 52.9	-4. -5. -5. 0.
20.	1.0	0.1 0.25 0.5 1.0	193.5 137.0 87.9 43.2	2. -6. -6. -7.	.31 .30 .31 .30	168.0 123.8 79.8 41.1	8. 0. 0. -3.	.42 .40 .41 .41	160.3 119.5 77.5 40.4	8. 1. 1. -2.	.52 .50 .53 .51	153.3 115.4 74.9 39.3	8. 2. 0. -3.	.61 .61 .60 .59	147.8 110.8 73.4 39.2	6. 2. -1. -3.	.70 .72 .70 .69	142.5 105.4 71.5 38.6	4. -1. -2. -3.	.80 .81 .80 .81	136.5 103.4 69.6 38.0	1. -6. -5. -4.
	0.0	0.1 0.25 0.5 1.0	220.7 169.3 124.6 52.9	4. 0. -7. 0.	.31 .31 .30 .30	188.2 148.9 113.2 52.9	14. 8. 2. 0.	.41 .41 .39 .40	179.8 143.6 109.3 52.9	15. 9. 4. 0.	.50 .48 .49 .50	172.1 139.5 105.8 52.9	16. 9. 5. 0.	.63 .61 .60 .60	161.5 132.9 101.7 52.9	13. 8. 5. 0.	.73 .72 .73 .70	154.5 127.6 97.4 52.9	10. 5. 2. 0.	.80 .80 .80 .81	149.5 124.4 95.1 52.9	7. 2. -1. -1.
	-0.98	0.1 0.25 0.5 1.0	239.2 193.5 124.6 52.9	10. -4. -5. 0.	.30 .30 .30 .30	203.0 168.8 124.6 52.9	23. 9. -5. 0.	.40 .40 .40 .40	192.3 161.5 124.6 52.9	27. 13. -5. 0.	.50 .50 .50 .50	182.4 154.7 124.6 52.9	31. 17. -5. 0.	.62 .60 .60 .60	171.6 148.3 121.9 52.9	32. 20. -2. 0.	.69 .70 .70 .70	165.6 142.3 117.7 52.9	31. 23. 1. 0.	.80 .79 .80 .80	157.4 137.3 113.4 52.9	28. 24. 5. 0.
30.	1.0	0.1 0.25 0.5 1.0	115.7 89.6 62.3 35.7	15. -1. -6. -8.	.31 .32 .31 .30	91.6 73.6 53.5 32.8	24. 10. 4. -2.	.44 .43 .42 .40	84.4 69.1 51.0 31.9	24. 13. 6. -1.	.56 .54 .53 .51	78.8 65.3 48.8 31.0	24. 14. 7. -2.	.60 .61 .60 .60	77.0 63.1 47.5 30.3	25. 15. 7. -1.	.69 .70 .69 .69	73.1 60.3 46.0 29.6	25. 15. 7. -0.	.82 .82 .82 .81	68.4 57.3 43.9 28.9	24. 13. 6. -1.
	0.0	0.1 0.25 0.5 1.0	124.6 105.7 82.9 52.9	27. 13. 4. -7.	.30 .30 .33 .31	98.7 85.9 68.5 47.7	38. 20. 14. 1.	.43 .40 .41 .40	90.0 80.7 65.5 46.1	37. 22. 16. 2.	.50 .50 .50 .50	86.3 76.0 62.6 44.4	37. 22. 17. 3.	.60 .59 .60 .60	81.1 72.4 59.7 42.9	36. 24. 13. 5.	.71 .71 .71 .69	75.4 68.0 56.7 41.5	35. 24. 18. 6.	.81 .81 .80 .81	72.2 64.7 54.5 40.0	33. 23. 16. 5.
	-0.98	0.1 0.25 0.5 1.0	129.6 115.7 97.1 52.9	41. 36. 19. 0.	.30 .31 .30 .30	101.5 91.6 79.7 52.9	53. 48. 33. 0.	.42 .41 .40 .40	93.7 86.3 75.2 52.9	55. 49. 37. 0.	.50 .50 .50 .50	88.9 81.6 71.1 52.9	56. 50. 41. 0.	.61 .62 .60 .60	83.2 76.2 67.5 52.9	57. 51. 44. 0.	.69 .72 .69 .70	79.3 72.2 64.9 50.9	56. 50. 44. 4.	.78 .80 .81 .80	75.4 69.1 61.0 48.9	54. 43. 42. 8.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 6

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	374.2	-4.	.30	361.6	-0.	.40	357.2	1.	.50	352.7	2.	.60	348.1	1.	.70	343.5	-2.	.81	338.4	-6.
		0.25	248.7	-4.	.30	239.5	0.	.40	236.5	1.	.50	233.6	3.	.59	230.8	3.	.70	227.8	3.	.80	225.0	0.
		0.5	142.1	-3.	.30	136.6	0.	.41	134.7	0.	.52	132.8	0.	.61	131.4	-1.	.70	129.9	-2.	.80	128.2	-4.
		1.0	54.5	-6.	.30	53.6	-5.	.41	53.3	-6.	.51	53.0	-6.	.60	52.8	-6.	.71	52.5	-6.	.80	52.2	-7.
	0.0	0.1	408.4	-4.	.30	408.4	-4.	.40	408.3	-4.	.50	404.1	-3.	.60	399.8	-2.	.69	395.5	-2.	.80	390.7	-6.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	281.2	-5.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
	-0.98	0.1	408.4	-4.	.30	408.4	-4.	.40	408.4	-4.	.50	408.4	-4.	.60	408.4	-4.	.70	408.4	-4.	.80	408.4	-4.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	281.2	-5.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
20.	1.0	0.1	242.8	15.	.31	203.5	24.	.42	192.9	25.	.52	182.9	26.	.61	174.9	25.	.69	167.5	25.	.80	159.1	23.
		0.25	171.2	2.	.31	147.0	12.	.41	140.0	14.	.51	133.9	15.	.60	129.0	16.	.70	123.7	15.	.80	119.0	13.
		0.5	101.0	-3.	.31	90.2	3.	.42	87.0	4.	.53	83.9	5.	.60	82.1	5.	.69	80.0	5.	.81	77.3	3.
		1.0	47.1	-8.	.31	44.7	-5.	.40	44.0	-5.	.51	43.3	-6.	.59	42.8	-4.	.71	42.0	-5.	.80	41.5	-5.
	0.0	0.1	274.3	18.	.30	226.1	31.	.41	212.7	32.	.50	202.2	34.	.61	190.5	34.	.72	180.4	32.	.81	172.6	30.
		0.25	213.7	12.	.30	183.3	21.	.41	173.1	23.	.50	165.9	24.	.61	157.0	24.	.70	150.8	24.	.79	144.5	23.
		0.5	153.0	1.	.32	132.0	11.	.40	127.1	13.	.50	122.3	14.	.60	117.3	15.	.71	112.5	14.	.80	103.8	13.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-1.
	-0.98	0.1	294.7	25.	.30	239.8	39.	.40	225.4	42.	.50	212.4	46.	.60	200.8	49.	.69	191.0	49.	.80	180.9	48.
		0.25	242.8	16.	.30	204.9	24.	.40	194.5	28.	.50	184.9	31.	.60	175.5	35.	.70	166.9	38.	.80	159.2	41.
		0.5	163.2	-2.	.30	163.2	-2.	.40	156.2	2.	.50	149.0	7.	.60	142.4	11.	.70	136.3	15.	.80	130.7	18.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
30.	1.0	0.1	131.4	32.	.30	103.8	39.	.40	97.0	40.	.52	90.1	40.	.60	86.2	39.	.69	82.0	39.	.80	77.5	39.
		0.25	101.5	9.	.31	82.6	20.	.42	77.4	22.	.54	72.9	23.	.60	70.5	24.	.71	67.5	25.	.80	64.3	24.
		0.5	69.0	-1.	.31	59.3	6.	.41	56.6	8.	.52	54.2	9.	.60	52.6	10.	.71	50.4	11.	.81	48.7	11.
		1.0	38.9	-8.	.31	35.6	-5.	.42	34.6	-3.	.52	33.8	-2.	.60	33.1	-2.	.71	32.2	-2.	.79	31.6	-2.
	0.0	0.1	141.3	42.	.30	111.1	52.	.42	101.7	52.	.50	96.4	52.	.60	90.8	52.	.71	85.5	51.	.81	81.0	53.
		0.25	120.3	26.	.31	96.0	33.	.40	90.5	34.	.49	85.5	35.	.60	80.3	36.	.69	76.5	37.	.81	72.3	37.
		0.5	93.5	13.	.30	77.3	22.	.41	72.8	24.	.51	69.2	25.	.59	66.6	26.	.70	63.3	26.	.79	60.8	26.
		1.0	57.6	-7.	.30	52.9	-2.	.40	50.8	0.	.49	49.3	2.	.60	47.3	4.	.69	45.8	6.	.81	44.1	6.
	-0.98	0.1	146.7	53.	.30	114.3	63.	.40	106.4	66.	.50	99.6	67.	.60	93.4	68.	.72	87.1	68.	.80	83.6	67.
		0.25	131.4	50.	.31	103.6	59.	.40	97.1	61.	.50	91.5	62.	.60	86.1	63.	.69	81.8	62.	.79	77.8	62.
		0.5	110.4	31.	.30	89.4	44.	.40	84.1	48.	.50	79.5	50.	.60	75.3	53.	.72	70.8	53.	.80	65.2	53.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	56.4	6.	.80	54.2	6.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 7

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	273.0	-7.	.30	269.5	-6.	.40	268.3	-6.	.50	267.1	-5.	.61	265.8	-8.	.69	264.7	-11.	.81	263.3	-19.
		0.25	199.2	-7.	.30	195.7	-5.	.40	194.6	-5.	.50	193.4	-4.	.58	191.3	-5.	.75	190.5	-7.	.79	190.1	-9.
		0.5	134.6	-7.	.30	131.9	-5.	.40	131.0	-4.	.50	130.1	-3.	.60	129.2	-3.	.71	128.2	-5.	.79	127.6	-9.
		1.0	63.4	-4.	.30	62.6	-3.	.40	62.3	-3.	.50	62.0	-3.	.60	61.8	-3.	.71	61.5	-4.	.79	61.2	-5.
	0.0	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	283.0	-4.	.72	283.0	-8.	.80	283.0	-14.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	210.7	-5.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
	-0.9	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	283.0	-4.	.70	283.0	-4.	.80	283.0	-4.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	210.7	-5.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
20.	1.0	0.1	230.2	-8.	.30	209.7	-3.	.40	203.1	-3.	.50	196.9	-3.	.62	189.5	-5.	.71	183.8	-9.	.79	179.0	-13.
		0.25	165.2	-9.	.30	152.9	-4.	.40	149.2	-4.	.49	145.7	-3.	.61	141.1	-5.	.71	138.0	-7.	.80	134.8	-12.
		0.5	109.9	-8.	.31	101.6	-2.	.41	99.2	-1.	.52	96.7	-2.	.61	94.6	-3.	.70	92.5	-5.	.80	90.6	-9.
		1.0	55.9	-6.	.31	53.4	-3.	.40	52.6	-3.	.50	51.9	-3.	.61	51.1	-3.	.70	50.5	-4.	.80	49.8	-5.
	0.0	0.1	260.3	-8.	.30	237.5	-1.	.40	229.0	0.	.50	221.3	-0.	.62	212.0	-3.	.72	204.4	-7.	.80	198.1	-11.
		0.25	202.6	-7.	.30	185.8	-0.	.40	183.4	0.	.49	175.3	0.	.61	169.4	-1.	.71	164.6	-4.	.80	160.1	-8.
		0.5	141.8	-5.	.30	141.0	-4.	.39	137.9	-2.	.50	134.5	-1.	.60	130.9	-1.	.73	126.2	-5.	.81	123.2	-10.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
	-0.9	0.1	280.2	-3.	.30	255.7	6.	.40	246.7	10.	.51	237.0	13.	.60	228.0	13.	.72	217.9	11.	.81	210.7	9.
		0.25	210.7	-5.	.30	210.0	-4.	.40	203.4	-1.	.50	196.9	2.	.60	190.6	5.	.70	184.4	8.	.80	178.9	1.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
30.	1.0	0.1	155.1	6.	.33	125.4	14.	.44	117.1	15.	.56	109.4	16.	.59	107.8	16.	.72	100.8	16.	.80	96.5	14.
		0.25	119.1	-5.	.30	100.4	4.	.41	95.0	7.	.52	90.4	9.	.60	86.7	10.	.70	83.2	10.	.79	79.9	7.
		0.5	82.2	-5.	.31	71.8	2.	.42	68.8	4.	.53	66.1	5.	.60	64.3	5.	.73	61.6	4.	.79	60.2	3.
		1.0	46.9	-8.	.30	43.3	-1.	.41	42.1	0.	.51	41.0	0.	.59	40.3	0.	.71	39.2	1.	.81	38.3	1.
	0.0	0.1	169.3	12.	.30	136.8	23.	.43	126.3	24.	.51	120.1	24.	.60	113.8	25.	.72	106.7	23.	.81	101.9	21.
		0.25	141.2	5.	.30	117.6	13.	.41	110.0	14.	.50	104.9	15.	.60	99.8	16.	.70	94.8	16.	.81	90.0	14.
		0.5	109.8	-2.	.29	94.0	8.	.40	89.4	11.	.50	85.3	13.	.60	81.4	13.	.71	77.7	12.	.81	74.7	9.
		1.0	66.4	-4.	.30	64.3	-3.	.40	62.0	-1.	.50	59.9	1.	.60	57.9	3.	.70	55.9	3.	.79	54.4	2.
	-0.9	0.1	178.0	26.	.30	142.7	37.	.40	133.0	39.	.50	125.1	41.	.59	118.1	42.	.71	110.8	42.	.80	105.0	40.
		0.25	155.1	22.	.31	127.2	35.	.40	120.0	38.	.50	113.3	39.	.60	107.1	40.	.70	101.6	39.	.80	96.5	37.
		0.5	129.7	5.	.30	108.5	20.	.40	102.7	24.	.50	97.6	28.	.60	92.9	32.	.69	89.0	35.	.82	84.1	33.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 8

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	393.6	-6.	.30	385.7	-4.	.40	383.0	-4.	.50	380.1	-3.	.60	377.3	-3.	.70	374.3	-5.	.80	371.2	-9.
		0.25	276.2	-5.	.30	269.0	-2.	.40	266.7	-1.	.50	264.3	-0.	.60	262.0	0.	.68	260.1	1.	.80	257.3	-2.
		0.5	167.4	-3.	.30	162.4	-0.	.40	160.7	0.	.51	159.0	-1.	.60	157.7	-1.	.70	156.1	-3.	.81	154.5	-5.
		1.0	68.1	-6.	.30	67.1	-4.	.41	66.8	-4.	.50	66.5	-4.	.60	66.2	-4.	.70	65.8	-4.	.79	65.6	-5.
	0.0	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.6	-4.	.69	415.6	-4.	.80	415.6	-9.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	300.2	-4.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
	-0.98	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.6	-4.	.70	415.6	-4.	.80	415.6	-4.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	300.2	-4.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
20.	1.0	0.1	297.6	1.	.30	259.9	11.	.40	248.8	12.	.50	238.0	13.	.61	227.9	13.	.70	219.5	12.	.79	211.3	10.
		0.25	211.6	-4.	.30	187.5	6.	.39	180.3	8.	.49	173.7	9.	.61	166.4	9.	.70	160.7	8.	.80	155.0	5.
		0.5	127.1	-2.	.31	115.5	1.	.41	112.1	3.	.51	108.9	4.	.60	106.3	3.	.70	103.5	2.	.79	101.0	1.
		1.0	59.4	-8.	.30	56.7	-3.	.40	55.8	-2.	.50	54.9	-3.	.59	54.2	-2.	.70	53.4	-2.	.81	52.6	-2.
	0.0	0.1	338.6	2.	.30	291.3	15.	.40	277.1	17.	.50	263.8	18.	.60	251.7	18.	.72	238.7	17.	.80	230.8	15.
		0.25	260.8	2.	.31	230.3	11.	.40	222.0	13.	.49	214.5	14.	.61	205.0	14.	.72	195.7	13.	.81	188.7	12.
		0.5	185.6	-3.	.30	168.7	6.	.40	162.6	7.	.49	157.5	8.	.60	151.4	9.	.71	145.7	8.	.81	140.9	6.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.5	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
	-0.98	0.1	366.2	8.	.30	312.1	22.	.40	295.9	26.	.50	280.8	30.	.59	267.8	33.	.73	250.9	33.	.79	242.9	33.
		0.25	297.6	-3.	.30	260.1	10.	.40	248.9	14.	.50	238.4	17.	.60	228.6	21.	.70	219.4	24.	.80	210.8	27.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	184.6	-2.	.70	177.6	2.	.80	171.0	6.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
30.	1.0	0.1	176.3	22.	.33	138.0	31.	.45	127.6	32.	.57	118.9	32.	.60	117.3	33.	.70	111.1	33.	.81	105.1	32.
		0.25	134.1	6.	.31	110.5	16.	.41	104.4	18.	.52	98.7	20.	.60	95.3	21.	.71	90.1	22.	.81	86.4	21.
		0.5	90.4	-0.	.32	78.0	7.	.42	74.6	9.	.53	71.5	10.	.61	69.4	10.	.70	67.1	11.	.81	64.5	11.
		1.0	49.5	-9.	.30	45.6	-1.	.40	44.4	0.	.50	43.3	2.	.60	42.3	3.	.71	41.2	3.	.79	40.5	4.
	0.0	0.1	191.1	29.	.33	147.8	40.	.41	139.5	41.	.50	132.2	42.	.60	124.1	42.	.71	116.6	41.	.81	111.0	40.
		0.25	160.3	19.	.30	130.0	27.	.40	122.3	28.	.50	115.2	30.	.59	109.6	31.	.70	103.4	32.	.80	98.7	31.
		0.5	123.2	10.	.32	101.9	19.	.41	97.5	21.	.49	93.6	22.	.59	89.2	23.	.71	84.7	23.	.79	81.7	23.
		1.0	71.8	-5.	.30	69.3	-3.	.40	66.9	0.	.48	64.7	2.	.59	62.3	4.	.70	60.1	5.	.79	58.3	7.
	-0.98	0.1	199.4	41.	.29	157.3	52.	.42	143.3	55.	.50	136.3	57.	.60	128.4	58.	.70	121.2	58.	.79	114.9	57.
		0.25	176.3	37.	.30	140.5	50.	.40	131.9	52.	.50	124.2	53.	.60	117.2	54.	.70	110.7	55.	.81	105.0	54.
		0.5	146.3	19.	.30	120.0	34.	.40	113.2	38.	.50	107.1	41.	.60	101.7	44.	.69	97.3	46.	.80	92.4	47.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 9

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	303.4	-6.	.30	298.1	-5.	.40	296.3	-4.	.50	294.5	-4.	.61	292.4	-7.	.70	294.7	-11.	.79	288.9	-16.
		0.25	213.7	-7.	.30	209.1	-5.	.40	207.6	-4.	.50	205.1	-3.	.61	204.4	-4.	.70	203.0	-5.	.79	201.7	-10.
		0.5	141.4	-6.	.30	138.9	-4.	.40	138.1	-4.	.50	137.2	-3.	.60	136.4	-3.	.70	135.6	-2.	.79	134.9	-6.
		1.0	74.3	-2.	.30	73.1	-1.	.40	72.8	-1.	.51	72.4	-1.	.60	72.1	-2.	.71	71.6	-3.	.80	71.3	-5.
	0.0	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.4	-3.	.72	318.4	-8.	.80	318.4	-14.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.80	229.1	-4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
	-0.98	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.4	-3.	.70	318.4	-3.	.80	318.4	-3.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.80	229.1	-4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
20.	1.0	0.1	240.7	-3.	.31	213.6	3.	.42	205.5	3.	.51	198.0	3.	.60	191.8	4.	.74	182.0	-1.	.80	178.2	-2.
		0.25	170.8	-7.	.31	156.1	-1.	.40	152.0	-1.	.50	147.6	0.	.60	143.3	0.	.72	139.0	-1.	.80	135.9	-5.
		0.5	118.7	-10.	.30	109.8	-2.	.41	106.7	-1.	.50	104.1	-0.	.60	101.5	0.	.72	98.5	-3.	.80	90.6	-6.
		1.0	64.3	-5.	.31	60.8	-0.	.40	59.8	-1.	.51	58.7	-0.	.60	57.9	-1.	.69	57.0	-1.	.81	55.9	-4.
	0.0	0.1	274.8	-2.	.31	241.5	7.	.41	231.5	8.	.50	222.8	8.	.60	213.1	8.	.70	204.3	5.	.80	196.8	2.
		0.25	210.6	-3.	.31	189.2	4.	.41	183.1	5.	.49	177.6	6.	.60	171.4	5.	.72	165.0	3.	.80	160.6	-0.
		0.5	150.2	-6.	.30	144.2	-2.	.39	140.8	1.	.49	137.2	2.	.59	133.4	3.	.71	129.4	1.	.81	126.1	-3.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	73.4	-2.
	-0.98	0.1	298.1	3.	.30	261.4	15.	.40	249.6	19.	.50	238.0	22.	.62	225.8	23.	.72	215.6	22.	.81	207.2	19.
		0.25	229.1	-4.	.30	214.7	2.	.40	206.7	6.	.50	199.0	10.	.60	191.6	13.	.70	184.7	16.	.81	177.5	17.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	146.9	-2.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	73.4	-1.
30.	1.0	0.1	152.7	9.	.32	123.4	20.	.44	114.4	21.	.58	105.9	22.	.60	104.8	22.	.71	98.7	22.	.80	94.4	23.
		0.25	120.8	-5.	.31	100.7	7.	.43	94.9	10.	.53	90.2	12.	.60	87.2	13.	.70	83.2	14.	.78	80.1	14.
		0.5	87.1	-5.	.32	75.3	5.	.42	72.2	6.	.53	68.9	8.	.60	67.0	8.	.69	64.9	9.	.79	62.5	7.
		1.0	52.4	-7.	.30	47.8	1.	.41	46.3	3.	.52	45.0	3.	.59	44.2	4.	.71	42.8	4.	.81	41.7	3.
	0.0	0.1	165.5	19.	.32	130.9	32.	.42	122.9	32.	.50	116.8	32.	.60	110.5	31.	.71	103.9	31.	.80	98.7	30.
		0.25	139.9	8.	.32	115.1	17.	.41	108.7	18.	.50	103.8	20.	.60	98.3	21.	.70	93.4	22.	.81	83.3	21.
		0.5	112.8	-2.	.32	94.5	10.	.40	90.6	12.	.48	87.1	15.	.60	82.6	17.	.71	78.7	17.	.80	75.6	16.
		1.0	77.7	-6.	.31	68.1	4.	.40	65.7	5.	.49	63.6	7.	.60	61.0	8.	.69	59.1	9.	.80	57.0	8.
	-0.98	0.1	173.0	34.	.31	136.8	47.	.42	126.3	49.	.49	120.9	50.	.57	115.3	51.	.68	108.0	51.	.80	101.2	49.
		0.25	152.7	29.	.31	124.2	41.	.41	116.8	43.	.50	111.0	45.	.61	104.2	45.	.72	98.1	45.	.79	94.7	44.
		0.5	129.5	10.	.30	108.5	25.	.40	102.6	29.	.50	97.2	33.	.60	92.4	36.	.69	88.5	39.	.79	84.3	38.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	77.3	1.	.60	74.1	5.	.70	71.2	9.	.80	68.4	12.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD -- COLUMN 10

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	419.4	-5.	.30	408.6	-3.	.40	404.9	-2.	.50	401.1	-1.	.60	397.2	-2.	.70	393.2	-4.	.81	388.7	-9.
		0.25	285.9	-4.	.30	277.4	-1.	.40	274.7	-0.	.50	272.0	1.	.60	269.3	1.	.71	266.4	1.	.81	263.7	-1.
		0.5	183.7	-4.	.30	178.1	-1.	.40	176.2	-0.	.50	174.4	1.	.61	172.4	0.	.71	170.7	-1.	.80	169.1	-4.
		1.0	80.2	-3.	.30	78.8	-2.	.40	78.4	-2.	.51	77.9	-2.	.60	77.5	-2.	.70	77.1	-2.	.79	76.7	-2.
	0.0	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.5	-4.	.69	448.7	-4.	.81	444.3	-9.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	314.9	-4.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
	-0.98	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.5	-4.	.70	449.5	-4.	.80	449.5	-4.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	314.9	-4.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
20.	1.0	0.1	298.5	7.	.31	255.6	15.	.42	243.7	16.	.52	232.8	17.	.60	224.2	17.	.71	214.0	16.	.80	206.1	14.
		0.25	212.5	-2.	.30	190.4	6.	.40	183.7	7.	.50	176.8	9.	.60	169.8	10.	.71	162.9	10.	.80	158.0	8.
		0.5	137.4	-2.	.32	123.7	4.	.42	119.9	5.	.53	116.0	6.	.60	113.8	6.	.71	110.3	5.	.79	107.6	4.
		1.0	68.6	-6.	.30	64.9	-1.	.40	63.8	-0.	.51	62.7	-0.	.60	61.8	0.	.70	60.7	-0.	.80	59.8	-1.
	0.0	0.1	339.7	9.	.30	287.0	21.	.41	271.1	23.	.50	259.1	24.	.61	245.2	24.	.71	233.5	23.	.81	223.5	21.
		0.25	261.7	6.	.31	228.7	14.	.40	219.6	16.	.49	211.7	16.	.60	203.1	17.	.70	195.0	16.	.80	185.4	15.
		0.5	195.0	-4.	.30	174.7	7.	.39	168.5	10.	.50	161.8	12.	.60	155.7	13.	.70	150.3	12.	.80	145.2	10.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.81	85.3	0.
	-0.98	0.1	367.4	15.	.30	306.3	29.	.40	289.2	33.	.50	273.6	37.	.59	260.2	39.	.70	246.8	40.	.79	235.5	39.
		0.25	298.5	1.	.30	257.4	15.	.40	245.5	19.	.50	234.5	23.	.60	224.3	26.	.70	214.9	29.	.80	206.1	32.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	192.8	0.	.60	186.0	4.	.70	179.0	7.	.80	172.1	11.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
30.	1.0	0.1	173.1	21.	.31	137.0	32.	.42	127.5	33.	.54	118.3	33.	.60	114.7	34.	.70	108.4	34.	.80	102.6	35.
		0.25	135.6	6.	.31	111.2	18.	.42	104.4	20.	.54	98.2	22.	.60	95.2	23.	.69	91.1	24.	.81	86.4	24.
		0.5	95.7	-1.	.31	82.8	10.	.42	78.2	12.	.52	74.7	13.	.60	72.6	14.	.70	69.6	14.	.78	67.6	14.
		1.0	55.9	-5.	.30	51.0	1.	.41	49.6	2.	.51	48.2	4.	.60	47.0	4.	.69	46.0	5.	.81	44.7	5.
	0.0	0.1	185.8	33.	.30	146.1	44.	.43	134.2	45.	.50	127.6	45.	.60	120.4	45.	.70	113.9	44.	.80	107.9	44.
		0.25	159.0	18.	.31	127.4	28.	.42	119.0	30.	.50	113.4	30.	.59	107.7	32.	.70	102.1	33.	.80	96.9	33.
		0.5	125.9	9.	.31	104.6	20.	.41	98.9	22.	.49	94.8	24.	.60	89.9	25.	.70	85.9	26.	.80	82.1	29.
		1.0	84.4	-6.	.30	73.7	6.	.40	70.9	7.	.49	68.3	9.	.59	65.9	10.	.69	63.7	12.	.80	61.3	12.
	-0.98	0.1	192.7	46.	.30	150.7	58.	.41	139.6	60.	.50	131.9	61.	.60	124.0	62.	.70	116.6	63.	.80	110.3	62.
		0.25	173.1	41.	.31	137.0	52.	.40	128.8	54.	.50	121.5	56.	.60	114.3	57.	.70	108.3	57.	.81	102.4	56.
		0.5	146.6	24.	.30	119.7	38.	.40	112.8	42.	.50	106.6	45.	.60	101.1	48.	.69	95.6	50.	.80	91.5	50.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	84.1	2.	.60	80.4	7.	.70	77.1	10.	.80	74.0	14.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 11

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	320.0	-7.	.30	317.0	-6.	.40	315.9	-6.	.49	315.0	-5.	.62	313.7	-8.	.70	312.7	-11.	.79	311.8	-15.
		0.25	238.4	-7.	.30	235.2	-5.	.40	234.1	-5.	.50	233.0	-4.	.60	232.0	-4.	.70	230.8	-5.	.80	229.8	-10.
		0.5	164.8	-6.	.30	162.7	-5.	.40	162.0	-5.	.50	161.4	-4.	.60	160.7	-4.	.70	160.0	-3.	.81	159.3	-6.
		1.0	92.5	-2.	.30	91.4	-1.	.40	91.0	-1.	.51	90.6	-1.	.61	90.3	-1.	.71	89.9	-3.	.80	89.6	-4.
	0.0	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.9	-3.	.71	328.9	-6.	.79	328.9	-10.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
	-0.98	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.9	-3.	.70	328.9	-3.	.80	328.9	-3.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
20.	1.0	0.1	283.2	-11.	.30	264.9	-7.	.40	259.0	-7.	.49	253.0	-8.	.61	245.9	-9.	.72	238.7	-13.	.81	233.4	-18.
		0.25	206.2	-11.	.30	194.0	-7.	.39	190.1	-6.	.49	186.3	-5.	.60	182.0	-6.	.72	177.8	-9.	.79	175.1	-12.
		0.5	145.3	-11.	.30	138.2	-5.	.40	136.1	-4.	.49	134.0	-3.	.61	131.4	-3.	.72	128.6	-7.	.81	126.2	-12.
		1.0	82.5	-5.	.30	79.0	-2.	.41	77.9	-2.	.51	76.8	-1.	.60	75.9	-1.	.70	74.8	-3.	.80	73.9	-6.
	0.0	0.1	317.6	-10.	.30	298.3	-6.	.41	291.0	-7.	.50	284.4	-7.	.60	276.7	-8.	.72	267.9	-13.	.81	261.1	-18.
		0.25	248.9	-9.	.30	235.0	-4.	.40	229.6	-4.	.49	224.6	-4.	.60	219.0	-4.	.71	213.5	-7.	.80	209.0	-11.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.49	171.9	-4.	.59	169.0	-3.	.72	164.6	-6.	.81	162.1	-9.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
	-0.98	0.1	328.9	-3.	.30	320.8	-0.	.40	313.5	2.	.51	305.2	3.	.60	297.3	3.	.70	289.2	2.	.79	281.1	-1.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	246.3	-3.	.70	240.1	-0.	.80	233.9	2.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
30.	1.0	0.1	207.9	-1.	.33	172.9	8.	.44	163.2	9.	.54	154.5	10.	.60	150.4	10.	.69	144.0	11.	.79	137.6	9.
		0.25	159.5	-9.	.31	139.5	-2.	.41	133.6	0.	.50	128.3	2.	.50	122.9	4.	.70	117.9	5.	.79	113.5	3.
		0.5	116.2	-11.	.30	103.1	-1.	.40	99.5	1.	.50	96.0	2.	.60	92.6	4.	.72	89.2	3.	.80	66.7	0.
		1.0	69.8	-6.	.30	64.4	-1.	.40	62.8	0.	.51	61.3	1.	.60	60.0	2.	.69	58.7	2.	.78	57.5	1.
	0.0	0.1	229.6	4.	.31	189.1	15.	.42	177.4	16.	.50	168.9	17.	.60	160.2	17.	.69	152.8	17.	.81	144.4	16.
		0.25	187.8	-1.	.30	160.9	6.	.42	152.4	8.	.49	146.9	9.	.60	140.2	10.	.69	134.6	11.	.80	128.1	9.
		0.5	148.9	-8.	.30	131.5	1.	.40	126.0	4.	.50	120.6	6.	.59	116.3	8.	.72	110.4	8.	.79	107.2	6.
		1.0	96.3	-4.	.30	92.8	-1.	.40	89.7	0.	.49	87.1	2.	.60	84.1	3.	.70	81.5	4.	.80	79.0	2.
	-0.98	0.1	243.6	17.	.30	198.8	28.	.40	186.5	30.	.50	175.9	32.	.59	166.9	33.	.71	156.8	33.	.81	148.5	31.
		0.25	207.9	13.	.30	175.0	26.	.40	166.2	28.	.49	158.5	30.	.60	150.7	32.	.71	142.4	31.	.81	136.4	29.
		0.5	171.9	-4.	.30	149.5	9.	.40	143.0	13.	.50	137.0	17.	.60	131.2	20.	.69	126.1	24.	.80	120.2	26.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.0	0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 12

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	442.0	-7.	.30	435.8	-6.	.40	433.6	-5.	.50	431.3	-4.	.60	429.1	-5.	.70	426.8	-7.	.80	424.3	-10.
		0.25	318.8	-6.	.30	312.7	-4.	.40	310.7	-3.	.50	308.6	-3.	.60	306.6	-2.	.69	304.7	-1.	.81	302.4	-3.
		0.5	213.7	-5.	.30	210.1	-3.	.40	208.9	-2.	.50	207.8	-2.	.60	206.6	-1.	.71	204.9	-2.	.80	203.5	-5.
		1.0	101.2	-3.	.30	99.7	-2.	.40	99.3	-2.	.50	98.8	-2.	.60	98.4	-2.	.70	97.9	-3.	.79	97.5	-3.
	0.0	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	460.0	-4.	.69	460.0	-4.	.81	460.0	-3.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	339.1	-4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
	-0.98	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	460.0	-4.	.70	460.0	-4.	.80	460.0	-4.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	339.1	-4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
20.	1.0	0.1	364.1	-6.	.31	327.4	2.	.40	317.6	3.	.50	306.7	3.	.60	295.6	3.	.71	285.1	2.	.81	275.6	-1.
		0.25	260.1	-7.	.30	239.7	-0.	.39	233.6	1.	.49	227.5	2.	.60	220.6	2.	.70	215.0	1.	.82	208.8	-1.
		0.5	173.7	-5.	.31	159.9	1.	.41	155.8	1.	.53	151.3	2.	.60	148.7	2.	.70	145.0	1.	.81	141.2	-2.
		1.0	88.6	-5.	.31	84.4	-1.	.41	83.1	-1.	.51	81.9	-1.	.60	80.8	-0.	.70	79.6	-1.	.80	78.5	-1.
	0.0	0.1	413.3	-5.	.31	370.6	4.	.40	357.3	5.	.49	344.8	6.	.61	329.6	6.	.71	316.4	5.	.80	305.6	2.
		0.25	319.7	-4.	.30	290.3	4.	.40	281.8	5.	.49	274.0	6.	.60	264.6	6.	.71	255.8	5.	.80	248.2	3.
		0.5	226.0	-4.	.30	220.9	-1.	.40	215.4	1.	.49	210.5	3.	.61	204.1	4.	.71	198.1	3.	.80	193.0	2.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	105.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
	-0.98	0.1	445.9	-1.	.30	400.3	10.	.40	384.2	13.	.50	368.2	17.	.59	353.9	19.	.71	336.9	20.	.80	324.8	19.
		0.25	339.1	-4.	.30	328.8	-1.	.40	317.5	3.	.50	306.5	6.	.60	296.0	9.	.70	285.9	13.	.80	276.2	16.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	105.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
30.	1.0	0.1	238.3	11.	.33	191.3	20.	.44	178.3	21.	.56	167.1	23.	.60	163.1	23.	.68	156.3	24.	.79	147.5	24.
		0.25	184.4	-2.	.31	154.4	9.	.40	146.7	12.	.51	139.4	14.	.60	133.2	16.	.71	126.8	17.	.81	121.3	16.
		0.5	128.1	-2.	.31	111.4	6.	.41	107.0	8.	.51	102.9	9.	.59	99.8	10.	.71	95.7	11.	.81	92.3	10.
		1.0	73.8	-5.	.31	67.8	1.	.41	65.9	2.	.52	64.2	3.	.60	62.9	4.	.70	61.4	5.	.80	60.0	5.
	0.0	0.1	259.2	17.	.33	205.4	29.	.41	193.8	30.	.50	183.9	31.	.60	172.9	32.	.71	163.2	32.	.80	155.5	31.
		0.25	217.7	9.	.30	179.8	18.	.41	168.7	20.	.49	161.5	21.	.60	152.2	23.	.70	144.7	24.	.80	136.1	24.
		0.5	170.3	2.	.32	143.4	13.	.41	137.0	15.	.50	131.1	17.	.60	125.4	19.	.70	120.0	19.	.80	115.0	18.
		1.0	106.2	-4.	.31	99.7	1.	.39	96.6	3.	.48	93.6	4.	.59	90.0	6.	.70	87.0	7.	.79	84.3	3.
	-0.98	0.1	271.8	30.	.29	217.4	42.	.40	202.1	44.	.50	190.0	46.	.59	179.3	48.	.72	166.4	49.	.80	160.0	49.
		0.25	238.3	26.	.30	194.7	39.	.40	182.9	42.	.49	173.6	44.	.60	163.0	45.	.71	154.2	46.	.80	147.4	45.
		0.5	200.4	9.	.30	166.6	24.	.40	157.7	29.	.50	149.6	32.	.60	142.2	35.	.69	136.2	33.	.80	129.4	40.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	103.0	3.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 13

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	226.6	-3.	.30	218.5	0.	.40	215.7	2.	.51	212.5	2.	.61	209.5	-1.	.70	207.0	-5.	.78	204.3	-10.
		0.25	149.4	-4.	.30	143.4	-0.	.40	141.4	1.	.51	139.2	1.	.63	137.0	-1.	.73	135.1	-2.	.78	134.3	-6.
		0.5	83.7	-4.	.30	80.2	0.	.40	79.1	1.	.53	77.8	-2.	.66	76.5	-3.	.72	75.8	-5.	.80	75.1	-9.
		1.0	32.5	-6.	.31	31.9	-5.	.41	31.8	-6.	.52	31.6	-6.	.63	31.4	-7.	.75	31.2	-9.	.80	31.1	-8.
	0.0	0.1	247.9	-5.	.30	247.9	-5.	.40	246.0	-4.	.50	243.4	-3.	.60	240.7	-2.	.69	238.1	-3.	.81	234.4	-12.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	171.2	-10.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.82	97.4	-8.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
	-0.98	0.1	247.9	-5.	.30	247.9	-5.	.40	247.9	-5.	.50	247.9	-5.	.60	247.9	-5.	.70	247.9	-5.	.80	247.9	-5.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	171.2	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.80	97.4	-1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
20.	1.0	0.1	142.4	14.	.32	118.0	25.	.45	109.7	25.	.45	109.7	25.	.54	99.5	23.	.64	99.5	23.	.79	92.6	19.
		0.25	100.4	-6.	.31	85.1	6.	.44	80.4	8.	.52	77.3	8.	.59	75.3	8.	.68	72.4	7.	.79	69.1	5.
		0.5	58.8	-11.	.32	52.4	-5.	.43	50.5	-4.	.56	48.5	-3.	.56	48.5	-3.	.73	46.3	-5.	.79	45.4	-6.
		1.0	28.0	-11.	.31	26.5	-10.	.42	26.1	-13.	.55	25.5	-11.	.55	25.5	-11.	.68	25.0	-11.	.80	24.6	-12.
	0.0	0.1	160.6	20.	.30	131.4	34.	.41	123.3	34.	.51	116.5	35.	.60	111.1	34.	.69	105.5	31.	.79	100.7	29.
		0.25	125.1	11.	.32	105.7	21.	.42	100.2	20.	.49	90.6	21.	.61	90.9	20.	.71	86.8	19.	.79	83.7	17.
		0.5	89.4	-3.	.31	76.8	8.	.41	73.7	9.	.50	70.9	10.	.60	68.0	9.	.70	65.3	8.	.80	62.9	5.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-1.	.72	34.4	-3.	.80	34.4	-4.
	-0.98	0.1	172.1	27.	.30	139.1	41.	.40	130.6	45.	.50	122.7	48.	.60	115.8	50.	.69	110.5	50.	.81	104.0	47.
		0.25	142.4	13.	.30	119.1	27.	.40	112.7	31.	.50	107.0	34.	.60	101.8	38.	.70	95.8	41.	.80	92.2	40.
		0.5	97.4	-1.	.30	95.6	1.	.40	90.8	6.	.50	86.5	10.	.60	82.6	14.	.70	79.0	18.	.80	75.7	22.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
30.	1.0	0.1	75.9	29.	.37	57.2	33.	.37	57.2	33.	.49	53.1	32.	.61	49.5	30.	.75	45.8	28.	.80	44.5	28.
		0.25	58.7	-7.	.33	47.3	5.	.46	43.9	8.	.46	43.9	8.	.61	40.7	10.	.68	39.3	11.	.80	37.3	10.
		0.5	40.3	-15.	.33	34.4	-7.	.45	32.6	-5.	.45	32.6	-5.	.59	30.8	-4.	.75	29.0	-4.	.80	26.5	-4.
		1.0	23.0	-16.	.32	21.0	-14.	.44	20.3	-13.	.44	20.3	-13.	.57	19.6	-12.	.69	19.1	-12.	.82	18.5	-12.
	0.0	0.1	81.6	40.	.32	62.8	51.	.42	58.6	50.	.51	55.4	50.	.61	52.0	49.	.72	49.1	47.	.79	47.1	45.
		0.25	69.5	21.	.28	56.3	24.	.38	52.9	24.	.51	49.0	25.	.59	46.7	25.	.70	44.6	25.	.80	41.9	25.
		0.5	54.2	-1.	.30	45.0	8.	.43	42.0	11.	.50	40.4	12.	.60	38.5	13.	.69	36.9	13.	.79	35.4	13.
		1.0	34.4	-13.	.32	30.7	-8.	.40	29.8	-6.	.50	28.7	-5.	.59	27.8	-4.	.71	26.7	-4.	.80	25.9	-4.
	-0.9	0.1	84.6	52.	.30	65.9	62.	.40	61.3	65.	.50	57.4	67.	.60	53.9	69.	.73	50.1	68.	.81	47.8	67.
		0.25	73.9	50.	.30	64.0	60.	.41	55.8	62.	.50	52.7	62.	.61	49.4	62.	.72	46.5	61.	.80	44.6	60.
		0.5	63.8	34.	.30	51.7	46.	.40	48.6	49.	.50	46.0	51.	.59	43.8	51.	.68	41.9	51.	.81	39.4	49.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.3	-0.	.70	32.8	4.	.80	31.6	3.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 14

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	335.4	0.	.30	317.1	6.	.40	310.8	8.	.50	304.5	9.	.62	297.1	9.	.78	266.9	5.	.80	285.0	4.
		0.25	211.6	-0.	.30	199.9	5.	.40	196.1	7.	.50	192.2	8.	.62	188.0	8.	.77	183.0	5.	.81	181.4	3.
		0.5	103.0	-6.	.30	97.8	-1.	.41	96.1	-1.	.53	94.4	-2.	.65	92.6	-3.	.77	90.9	-5.	.80	90.6	-5.
		1.0	36.2	-9.	.31	35.6	-9.	.41	35.4	-10.	.52	35.2	-10.	.63	35.0	-11.	.73	34.8	-11.	.83	34.6	-13.
	0.0	0.1	382.8	-5.	.30	366.7	-0.	.40	360.3	1.	.50	353.7	3.	.60	346.8	5.	.69	340.4	7.	.80	332.7	4.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	251.9	-3.	.70	246.7	-1.	.80	241.5	1.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
	-0.98	0.1	382.8	-5.	.30	382.8	-5.	.40	382.8	-5.	.50	382.8	-5.	.60	377.7	-3.	.70	370.5	-2.	.80	362.9	1.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	256.4	-5.	.70	255.4	-5.	.80	255.4	-5.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
20.	1.0	0.1	179.5	29.	.31	145.4	42.	.44	134.0	43.	.44	134.0	43.	.59	122.4	43.	.72	114.4	41.	.84	107.6	38.
		0.25	122.9	6.	.32	102.3	17.	.44	96.3	19.	.58	89.8	21.	.58	69.8	21.	.67	86.6	20.	.82	81.2	18.
		0.5	69.1	-10.	.32	61.1	-4.	.44	58.7	-4.	.58	56.2	-3.	.54	55.2	-3.	.73	53.6	-3.	.80	52.6	-4.
		1.0	31.3	-14.	.32	29.7	-14.	.43	29.1	-13.	.54	26.6	-13.	.67	28.1	-14.	.72	27.8	-13.	.79	27.0	-15.
	0.0	0.1	200.2	34.	.30	160.5	47.	.40	150.7	50.	.51	140.2	51.	.62	131.3	53.	.72	124.1	49.	.81	118.7	47.
		0.25	153.4	25.	.30	129.8	36.	.41	121.5	38.	.50	115.5	38.	.60	109.4	38.	.71	103.9	37.	.79	99.8	36.
		0.5	108.7	4.	.31	92.0	15.	.40	88.0	17.	.50	84.2	17.	.60	80.7	17.	.70	77.3	17.	.80	74.6	16.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-3.	.72	38.3	-4.	.79	38.3	-5.
	-0.98	0.1	212.5	42.	.30	168.6	54.	.40	157.6	57.	.50	147.7	59.	.59	139.7	62.	.73	129.4	63.	.79	124.9	62.
		0.25	179.5	27.	.30	145.9	40.	.40	136.9	44.	.50	129.0	47.	.60	122.0	50.	.70	115.7	53.	.80	110.0	55.
		0.5	125.2	-1.	.30	115.6	7.	.40	109.4	12.	.50	103.8	17.	.60	98.8	21.	.70	94.3	24.	.80	90.2	28.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
30.	1.0	0.1	90.1	45.	.35	68.6	52.	.35	68.6	52.	.52	61.4	51.	.62	58.2	50.	.73	54.6	49.	.81	52.4	48.
		0.25	69.3	4.	.35	55.0	11.	.35	55.0	11.	.49	50.8	14.	.64	47.1	17.	.72	45.4	17.	.80	43.7	17.
		0.5	46.7	-14.	.34	39.5	-7.	.46	37.4	-5.	.46	37.4	-5.	.59	35.5	-3.	.74	33.6	-2.	.51	32.8	-2.
		1.0	25.9	-19.	.32	23.6	-17.	.44	22.9	-16.	.44	22.9	-16.	.57	22.2	-15.	.69	21.5	-15.	.60	21.0	-14.
	0.0	0.1	96.8	54.	.31	75.2	63.	.42	69.4	64.	.51	65.6	64.	.61	61.6	63.	.72	59.0	63.	.81	55.3	62.
		0.25	82.4	38.	.30	65.7	42.	.40	61.6	42.	.51	57.8	42.	.61	54.5	41.	.70	52.1	40.	.80	49.5	39.
		0.5	63.7	6.	.32	52.1	13.	.41	49.5	15.	.50	47.3	17.	.60	45.0	18.	.70	43.0	19.	.80	41.1	19.
		1.0	38.3	-12.	.31	35.4	-11.	.40	34.2	-9.	.50	33.0	-8.	.59	31.9	-6.	.69	30.8	-5.	.81	29.7	-4.
	-0.93	0.1	100.4	63.	.30	78.0	71.	.40	72.6	73.	.50	67.9	75.	.59	64.2	76.	.73	59.1	77.	.81	56.6	76.
		0.25	90.1	61.	.30	71.0	69.	.40	66.5	71.	.51	62.1	71.	.60	58.7	72.	.71	55.1	71.	.80	52.7	71.
		0.5	75.5	39.	.30	60.9	51.	.40	57.2	54.	.51	53.9	56.	.60	51.2	57.	.69	49.0	57.	.80	46.4	57.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	36.2	-1.	.60	36.7	3.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 15

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	237.8	-5.	.30	232.0	-3.	.40	230.0	-2.	.50	227.9	-1.	.63	225.2	-4.	.73	223.0	-10.	.82	221.0	-16.
		0.25	165.1	-5.	.30	159.9	-2.	.40	158.2	-1.	.50	156.5	0.	.61	154.8	0.	.69	153.4	-2.	.81	151.4	-11.
		0.5	103.2	-4.	.30	96.8	-0.	.40	95.7	-0.	.52	94.5	-1.	.64	93.2	-3.	.79	91.7	-9.	.83	91.3	-12.
		1.0	40.5	-7.	.30	39.8	-5.	.40	39.6	[illegible]	.50	39.4	-4.	.60	39.2	-4.	.71	38.9	-4.	.80	38.7	-5.
	0.0	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.60	253.3	-5.	.72	251.7	-8.	.79	250.2	-14.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	182.6	-5.	.79	182.6	-7.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-7.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
	-0.98	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.60	253.3	-5.	.70	253.3	-5.	.80	253.3	-5.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	182.6	-5.	.80	182.6	-5.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-3.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
20.	1.0	0.1	168.7	8.	.32	143.2	17.	.45	134.5	17.	.53	129.5	18.	.62	124.1	16.	.75	117.1	13.	.81	114.0	11.
		0.25	120.4	-3.	.32	104.6	5.	.44	99.2	7.	.57	94.1	8.	.57	94.1	8.	.77	87.1	4.	.80	86.2	3.
		0.5	73.5	-7.	.31	66.1	-1.	.43	63.6	-0.	.57	61.1	-0.	.57	61.1	-0.	.71	58.7	-1.	.79	57.4	-2.
		1.0	34.7	-11.	.31	32.8	-6.	.41	32.3	-5.	.52	31.7	-4.	.63	31.2	-4.	.69	30.8	-4.	.81	30.3	-4.
	0.0	0.1	191.1	9.	.30	160.4	23.	.41	151.3	24.	.50	144.4	25.	.63	135.2	24.	.72	129.0	21.	.80	124.4	18.
		0.25	148.2	7.	.30	128.9	15.	.41	122.9	16.	.50	118.6	16.	.60	113.0	16.	.71	108.0	14.	.80	103.9	12.
		0.5	108.7	-4.	.30	95.3	7.	.41	91.4	8.	.49	88.3	9.	.61	84.6	9.	.70	81.7	3.	.81	78.6	4.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.69	43.1	-0.	.80	43.1	-1.
	-0.98	0.1	205.9	15.	.30	170.8	29.	.40	161.0	33.	.50	152.2	37.	.60	144.1	39.	.69	137.5	39.	.81	129.4	36.
		0.25	169.7	3.	.30	144.5	17.	.40	137.6	21.	.50	131.2	25.	.60	125.3	28.	.70	119.8	31.	.81	114.0	31.
		0.5	112.9	-3.	.30	112.9	-3.	.40	111.7	-2.	.50	106.8	2.	.60	102.3	7.	.70	98.2	10.	.81	93.9	11.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
30.	1.0	0.1	95.1	22.	.33	73.9	33.	.33	73.9	33.	.49	67.1	34.	.58	63.4	33.	.69	59.5	32.	.80	56.4	32.
		0.25	73.8	-0.	.32	59.9	12.	.45	55.7	14.	.45	55.7	14.	.60	51.7	17.	.60	51.7	17.	.83	46.4	16.
		0.5	50.9	-11.	.32	43.3	0.	.44	41.2	3.	.56	39.1	5.	.56	39.1	5.	.70	37.1	6.	.81	35.5	5.
		1.0	28.4	-14.	.31	25.9	-7.	.42	25.1	-6.	.53	24.4	-4.	.65	23.6	-3.	.77	23.0	-1.	.81	22.8	-1.
	0.0	0.1	102.4	32.	.29	80.9	45.	.42	74.2	46.	.50	70.1	46.	.61	65.6	45.	.70	62.6	44.	.81	58.8	42.
		0.25	87.1	18.	.27	71.7	28.	.41	65.6	29.	.50	61.9	29.	.58	59.2	30.	.69	56.1	29.	.78	53.6	29.
		0.5	68.2	4.	.30	56.7	15.	.41	53.4	17.	.50	51.1	18.	.60	48.6	19.	.69	46.6	20.	.81	44.2	19.
		1.0	43.1	-12.	.28	39.1	-4.	.40	37.4	-0.	.49	36.0	2.	.60	34.6	3.	.69	33.5	4.	.79	32.3	5.
	-0.98	0.1	106.3	43.	.30	83.0	56.	.40	77.3	59.	.49	72.7	61.	.59	68.2	63.	.69	64.4	63.	.81	60.5	61.
		0.25	95.1	44.	.30	75.5	55.	.40	70.5	56.	.50	66.5	58.	.50	62.7	58.	.71	59.0	57.	.80	56.4	56.
		0.5	80.1	27.	.30	65.2	40.	.40	61.4	44.	.50	58.0	47.	.61	54.7	49.	.69	52.5	49.	.80	43.3	43.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	41.3	4.	.80	39.7	8.

PREDICTED CAFACITIES AND ERRCRS USING ACI MOMENT MAGNIFICATION METHOD -. COLUMN 16

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	F_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	352.1	-3.	.30	338.3	1.	.40	333.5	3.	.50	328.5	4.	.60	323.3	5.	.75	315.8	1.	.81	312.9	-1.
		0.25	232.9	-1.	.30	222.5	3.	.40	219.1	5.	.50	215.9	6.	.60	212.5	7.	.77	207.3	4.	.80	206.3	2.
		0.5	123.3	-4.	.30	117.8	-0.	.41	115.9	-0.	.53	114.0	-1.	.65	112.1	-2.	.65	112.1	-2.	.78	109.9	-4.
		1.0	42.7	-8.	.30	42.0	-6.	.40	41.8	-6.	.50	41.6	-5.	.61	41.3	-5.	.78	41.0	-5.	.79	40.9	-5.
	0.0	0.1	389.0	-5.	.30	384.7	-4.	.40	380.5	-3.	.50	375.8	-2.	.60	370.9	-0.	.69	366.3	1.	.80	360.5	-1.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	269.2	-4.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
	-0.98	0.1	388.0	-5.	.30	388.0	-5.	.40	388.0	-5.	.50	388.0	-5.	.60	388.0	-5.	.70	388.0	-5.	.80	388.0	-5.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	270.1	-5.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
20.	1.0	0.1	212.2	22.	.31	174.5	34.	.43	162.1	35.	.43	162.1	35.	.58	149.4	36.	.67	143.0	35.	.78	134.9	33.
		0.25	147.2	7.	.32	123.9	18.	.44	116.7	20.	.44	116.7	20.	.58	109.8	21.	.76	101.4	20.	.82	99.1	13.
		0.5	84.5	-8.	.31	74.9	1.	.43	72.0	3.	.55	69.1	4.	.55	69.1	4.	.68	66.3	4.	.81	63.7	3.
		1.0	36.8	-12.	.31	34.9	-7.	.41	34.3	-7.	.52	33.7	-6.	.63	33.1	-5.	.74	32.6	-5.	.78	32.4	-5.
	0.0	0.1	237.8	25.	.30	193.5	39.	.40	182.1	42.	.50	171.1	43.	.62	159.6	43.	.70	153.2	42.	.81	144.5	40.
		0.25	187.7	19.	.31	155.2	31.	.40	147.4	32.	.50	140.0	33.	.61	132.7	34.	.71	126.3	33.	.80	121.2	32.
		0.5	130.9	4.	.31	111.8	15.	.40	107.3	16.	.50	102.9	18.	.60	98.6	19.	.71	94.2	18.	.81	90.7	17.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.60	45.3	-0.
	-0.98	0.1	253.6	31.	.30	203.6	45.	.40	190.8	49.	.50	179.3	52.	.59	170.0	54.	.72	158.0	55.	.80	151.5	55.
		0.25	212.2	18.	.30	175.7	32.	.40	165.4	36.	.50	156.2	39.	.60	147.9	43.	.70	140.5	46.	.80	133.7	43.
		0.5	145.6	-2.	.30	139.5	2.	.40	132.4	7.	.50	125.9	12.	.60	120.1	16.	.70	114.7	20.	.80	109.8	23.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
30.	1.0	0.1	109.8	39.	.33	85.1	48.	.47	77.3	49.	.47	77.3	49.	.67	69.0	49.	.74	66.4	49.	.82	63.6	48.
		0.25	84.6	8.	.33	67.9	19.	.45	63.2	22.	.45	63.2	22.	.65	56.9	26.	.75	54.4	26.	.81	52.9	26.
		0.5	56.6	-9.	.32	48.1	1.	.45	45.5	3.	.45	45.5	3.	.57	43.3	6.	.70	41.1	8.	.79	39.7	9.
		1.0	30.3	-14.	.31	27.7	-9.	.42	27.0	-7.	.54	26.2	-6.	.65	25.4	-4.	.77	24.7	-3.	.79	24.6	-2.
	0.0	0.1	118.1	47.	.30	92.2	59.	.41	85.2	59.	.51	80.2	60.	.61	75.4	59.	.71	71.0	59.	.81	67.2	58.
		0.25	100.5	33.	.30	80.4	42.	.41	74.6	43.	.50	70.8	43.	.60	66.7	44.	.71	63.2	44.	.81	59.9	43.
		0.5	77.8	11.	.30	64.2	20.	.40	60.7	23.	.50	57.6	25.	.59	55.0	26.	.71	52.1	27.	.80	49.9	27.
		1.0	45.3	-9.	.31	42.5	-6.	.40	41.1	-3.	.49	39.6	-1.	.59	38.2	1.	.69	36.9	4.	.80	35.5	5.
	-0.98	0.1	122.4	57.	.30	95.2	66.	.40	89.6	69.	.50	82.9	71.	.60	77.9	72.	.68	74.1	73.	.81	69.1	72.
		0.25	109.8	56.	.30	86.7	65.	.40	81.1	67.	.50	76.1	68.	.60	71.6	69.	.70	67.8	68.	.81	63.9	68.
		0.5	92.2	35.	.30	74.4	48.	.40	69.9	51.	.50	65.9	54.	.60	62.4	56.	.73	58.5	57.	.81	56.3	57.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	44.3	2.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 17

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	293.3	-4.	.30	285.9	-1.	.40	283.3	-0.	.50	280.7	-1.	.50	278.1	-3.	.70	275.2	-6.	.79	272.6	-12.
		0.25	203.4	-4.	.30	197.2	-1.	.40	195.2	-0.	.50	193.2	-0.	.59	191.3	-1.	.70	189.1	-2.	.78	187.6	-7.
		0.5	131.0	-5.	.30	127.7	-2.	.40	126.6	-1.	.50	125.5	-0.	.60	124.5	0.	.70	123.5	1.	.80	122.4	-3.
		1.0	67.5	-2.	.30	66.2	0.	.40	65.8	1.	.49	65.4	2.	.59	65.0	2.	.71	64.5	1.	.79	64.2	-2.
	0.0	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	313.2	-3.	.72	311.0	-6.	.81	308.7	-13.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.81	224.4	-9.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
	-0.98	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	313.2	-3.	.70	313.2	-3.	.80	313.2	-3.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.80	224.4	-4.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
20.	1.0	0.1	207.7	6.	.30	178.2	16.	.40	170.0	17.	.49	162.6	17.	.59	155.8	16.	.69	148.6	16.	.79	142.4	13.
		0.25	149.5	-3.	.30	133.0	5.	.39	128.4	6.	.50	123.7	7.	.60	119.4	7.	.70	115.4	8.	.81	111.3	6.
		0.5	103.1	-6.	.30	94.2	3.	.39	91.4	4.	.48	88.7	5.	.59	85.8	5.	.69	83.3	4.	.78	81.0	2.
		1.0	56.5	-6.	.29	53.3	0.	.39	52.3	1.	.49	51.2	2.	.59	50.3	2.	.71	49.2	2.	.80	48.4	0.
	0.0	0.1	235.0	10.	.30	197.5	23.	.40	186.9	24.	.51	177.2	25.	.61	168.6	24.	.72	159.2	23.	.80	153.8	20.
		0.25	182.9	5.	.31	158.7	14.	.41	152.4	15.	.50	146.8	15.	.60	140.7	16.	.71	134.6	15.	.81	129.3	13.
		0.5	137.2	-5.	.30	123.0	6.	.40	118.9	8.	.49	115.2	9.	.60	111.2	10.	.70	107.6	10.	.80	104.4	4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.72	72.4	-1.	.81	71.5	-3.
	-0.98	0.1	253.3	17.	.30	210.2	31.	.40	198.3	35.	.50	187.2	39.	.61	176.8	40.	.73	166.4	40.	.80	160.5	38.
		0.25	207.7	3.	.30	178.2	17.	.40	169.8	21.	.50	162.0	25.	.60	154.8	28.	.70	148.2	31.	.80	142.0	32.
		0.5	143.1	-4.	.30	143.1	-4.	.40	139.4	-1.	.50	134.0	3.	.60	129.0	7.	.70	124.3	10.	.80	119.9	13.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
30.	1.0	0.1	119.0	13.	.30	95.3	24.	.39	90.1	26.	.47	85.1	28.	.61	78.7	30.	.70	74.7	30.	.80	70.5	31.
		0.25	96.9	-4.	.30	79.7	12.	.38	75.9	15.	.48	71.8	17.	.57	68.5	18.	.69	64.6	20.	.81	61.2	21.
		0.5	71.5	-8.	.29	61.5	6.	.39	58.8	9.	.48	56.3	11.	.57	54.3	12.	.71	51.3	12.	.81	49.3	12.
		1.0	44.9	-8.	.30	40.6	-0.	.40	39.3	2.	.49	38.2	3.	.58	37.2	3.	.68	36.1	5.	.81	34.9	4.
	0.0	0.1	126.9	25.	.31	99.7	40.	.42	92.5	40.	.50	87.6	40.	.60	82.5	40.	.71	77.7	40.	.79	74.1	39.
		0.25	110.5	9.	.32	88.7	22.	.41	83.6	24.	.49	79.6	26.	.61	74.4	28.	.71	70.7	29.	.80	67.5	29.
		0.5	90.8	1.	.31	74.9	16.	.40	71.2	19.	.50	67.6	20.	.60	64.2	22.	.70	61.3	22.	.80	58.8	23.
		1.0	64.2	-4.	.31	55.6	8.	.39	53.5	10.	.49	51.5	12.	.60	49.3	13.	.70	47.5	14.	.80	45.8	14.
	-0.98	0.1	131.4	40.	.30	103.0	53.	.40	96.1	56.	.50	89.9	59.	.60	84.6	61.	.70	79.9	63.	.81	74.9	62.
		0.25	119.0	41.	.30	95.4	52.	.40	89.4	55.	.51	83.4	56.	.60	78.9	56.	.71	74.4	56.	.80	71.0	55.
		0.5	103.2	25.	.30	84.3	39.	.40	79.4	42.	.50	75.0	46.	.61	70.8	48.	.70	67.6	49.	.80	64.4	48.
		1.0	72.4	1.	.30	67.6	8.	.40	64.3	13.	.50	61.3	17.	.60	58.5	20.	.70	56.1	24.	.80	53.8	27.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 18

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	406.5	-2.	.30	391.4	1.	.40	386.1	3.	.50	380.8	4.	.60	375.4	4.	.70	369.7	1.	.81	363.5	-2.
		0.25	271.3	-2.	.30	260.3	3.	.40	256.7	4.	.50	253.2	5.	.60	249.8	5.	.69	246.5	4.	.80	243.0	3.
		0.5	167.6	-2.	.30	162.5	2.	.40	160.8	3.	.49	159.3	3.	.59	157.8	4.	.72	155.7	1.	.82	153.9	-1.
		1.0	74.0	-3.	.30	72.5	-1.	.39	72.1	-1.	.49	71.6	-1.	.60	71.1	-1.	.70	70.6	-1.	.80	70.2	-2.
	0.0	0.1	446.5	-4.	.30	445.5	-4.	.40	440.7	-2.	.50	435.7	-1.	.60	430.3	-0.	.70	424.7	1.	.80	419.0	-2.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	310.7	-4.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
	-0.98	0.1	446.5	-4.	.30	446.5	-4.	.40	446.5	-4.	.50	446.5	-4.	.60	446.5	-4.	.70	446.5	-4.	.80	446.5	-4.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	310.7	-4.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
20.	1.0	0.1	252.3	17.	.30	211.1	30.	.40	199.7	31.	.50	189.6	31.	.60	180.5	31.	.69	172.2	31.	.80	164.2	29.
		0.25	182.8	3.	.30	160.0	13.	.39	153.4	14.	.49	146.4	16.	.58	140.7	18.	.69	134.1	19.	.79	128.6	18.
		0.5	118.9	-3.	.29	106.3	7.	.39	102.5	8.	.48	99.4	10.	.58	96.2	10.	.71	92.5	9.	.79	90.2	9.
		1.0	61.6	-5.	.30	58.0	-1.	.40	56.8	-1.	.49	55.8	0.	.60	54.7	1.	.69	53.8	0.	.79	52.8	0.
	0.0	0.1	282.8	22.	.30	231.4	36.	.40	217.9	39.	.51	204.9	40.	.61	194.2	40.	.72	183.4	39.	.80	175.9	37.
		0.25	223.7	15.	.31	189.3	26.	.40	180.6	27.	.50	172.7	28.	.60	164.7	28.	.70	157.9	28.	.80	150.8	27.
		0.5	167.6	3.	.30	146.4	15.	.40	140.2	17.	.49	134.4	19.	.61	128.2	20.	.70	123.4	20.	.80	119.0	19.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.3	-1.
	-0.98	0.1	302.0	30.	.30	243.7	43.	.40	228.6	47.	.50	215.2	50.	.59	204.2	53.	.73	189.0	53.	.80	182.9	53.
		0.25	252.3	16.	.30	211.0	29.	.40	199.6	33.	.50	189.4	37.	.60	180.1	40.	.70	171.6	43.	.80	163.9	45.
		0.5	187.0	-2.	.30	173.5	6.	.40	165.8	10.	.50	158.7	14.	.60	151.8	18.	.70	145.1	21.	.80	138.9	25.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
30.	1.0	0.1	135.2	30.	.31	106.2	38.	.40	99.5	39.	.49	94.1	40.	.61	87.7	40.	.70	83.7	41.	.79	79.8	41.
		0.25	108.8	5.	.29	89.2	18.	.38	84.6	21.	.46	81.1	23.	.63	74.0	27.	.71	71.1	27.	.81	68.0	28.
		0.5	79.4	-2.	.30	67.8	8.	.39	65.0	10.	.45	62.5	13.	.59	59.4	14.	.69	57.0	15.	.79	54.9	16.
		1.0	48.9	-7.	.30	44.2	-0.	.39	42.9	1.	.49	41.6	2.	.60	40.4	4.	.71	39.1	5.	.81	38.0	5.
	0.0	0.1	143.9	41.	.31	112.0	53.	.41	103.9	54.	.51	97.8	55.	.60	92.1	54.	.71	86.8	54.	.79	82.9	53.
		0.25	125.5	23.	.30	100.3	32.	.41	93.3	34.	.50	88.7	35.	.59	83.9	37.	.69	79.6	38.	.80	75.2	39.
		0.5	101.7	9.	.31	83.4	22.	.40	79.3	24.	.50	75.3	27.	.60	71.7	28.	.70	68.2	29.	.80	65.1	29.
		1.0	71.0	-3.	.31	61.3	8.	.40	59.0	10.	.49	56.8	12.	.60	54.5	13.	.69	52.5	15.	.81	50.4	15.
	-0.98	0.1	148.5	53.	.30	115.5	63.	.40	107.5	66.	.50	100.6	68.	.60	94.5	70.	.69	89.6	71.	.80	84.3	71.
		0.25	135.2	51.	.30	106.9	62.	.39	100.4	64.	.51	93.3	65.	.60	88.4	65.	.69	84.2	66.	.79	79.5	65.
		0.5	116.7	37.	.30	94.3	49.	.40	88.7	52.	.50	83.7	55.	.61	79.0	56.	.71	74.9	57.	.80	71.6	57.
		1.0	79.6	1.	.30	75.1	6.	.40	71.4	11.	.50	68.0	15.	.60	64.9	19.	.70	62.1	22.	.80	59.6	26.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD -- COLUMN 19

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR	P_s/P	P_{ACI}	ERR
10.	1.0	0.1	311.3	-5.	.30	306.9	-3.	.40	305.3	-3.	.50	303.8	-3.	.60	302.1	-5.	.69	300.6	-7.	.79	298.9	-14.
		0.25	228.5	-5.	.30	223.9	-3.	.40	222.3	-2.	.50	220.7	-2.	.60	219.2	-2.	.70	217.7	-4.	.79	216.3	-7.
		0.5	154.6	-5.	.30	151.8	-3.	.40	150.9	-3.	.50	150.0	-2.	.60	149.1	-1.	.69	148.3	-1.	.79	147.4	-3.
		1.0	87.1	-2.	.30	85.7	-0.	.40	85.2	-0.	.51	84.7	-1.	.62	84.2	-1.	.71	83.8	-2.	.81	83.4	-4.
	0.0	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	324.0	-3.	.70	324.0	-5.	.81	324.0	-13.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.82	243.8	-7.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.60	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
	-0.98	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	324.0	-3.	.70	324.0	-3.	.80	324.0	-3.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.80	243.8	-4.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	154.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
20.	1.0	0.1	254.0	-2.	.30	227.7	6.	.39	219.6	6.	.49	211.6	6.	.59	204.5	6.	.70	195.8	4.	.79	189.5	2.
		0.25	183.7	-4.	.30	168.1	1.	.40	163.4	2.	.49	158.9	2.	.59	154.5	3.	.70	149.9	2.	.79	146.3	-0.
		0.5	129.5	-7.	.30	121.1	-0.	.39	118.7	0.	.49	116.1	1.	.58	113.4	1.	.70	110.0	1.	.80	137.4	-3.
		1.0	74.6	-5.	.30	70.7	0.	.40	69.3	0.	.51	68.0	1.	.61	66.9	0.	.70	65.9	0.	.60	64.7	-2.
	0.0	0.1	286.7	-1.	.31	254.7	8.	.40	244.6	9.	.50	235.1	10.	.60	224.9	10.	.71	214.9	8.	.80	207.3	5.
		0.25	224.2	-1.	.30	202.3	6.	.40	195.3	7.	.49	189.6	8.	.60	182.8	8.	.70	176.7	7.	.80	171.1	3.
		0.5	164.3	-5.	.30	155.5	0.	.39	151.7	3.	.49	147.6	4.	.60	143.6	5.	.69	139.9	5.	.80	136.2	2.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.69	92.2	-0.	.79	92.2	-3.
	-0.98	0.1	308.5	2.	.30	274.0	13.	.40	262.1	17.	.50	250.3	21.	.60	239.0	22.	.72	227.0	22.	.80	218.8	23.
		0.25	243.8	-4.	.30	227.6	3.	.40	219.2	7.	.50	211.1	10.	.60	203.3	13.	.70	196.0	17.	.81	183.0	17.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	162.0	-3.	.80	157.2	1.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
30.	1.0	0.1	161.9	9.	.29	132.5	23.	.39	124.9	25.	.48	118.4	26.	.58	112.4	26.	.70	104.9	26.	.81	99.5	26.
		0.25	129.4	-2.	.30	109.6	9.	.40	103.7	11.	.49	99.0	13.	.60	93.8	15.	.69	89.9	16.	.78	86.4	17.
		0.5	96.5	-5.	.30	83.6	6.	.40	80.2	8.	.50	76.7	9.	.60	73.6	12.	.70	71.0	11.	.81	65.1	13.
		1.0	60.3	-9.	.30	54.8	1.	.39	53.3	3.	.49	51.7	4.	.58	50.3	5.	.70	48.8	5.	.81	47.3	5.
	0.0	0.1	174.7	16.	.30	139.9	33.	.41	130.5	35.	.51	122.6	35.	.61	115.6	35.	.70	109.9	35.	.80	104.4	34.
		0.25	148.9	9.	.31	123.1	21.	.42	115.6	22.	.49	110.9	23.	.61	104.3	24.	.69	99.9	24.	.79	94.9	25.
		0.5	121.8	1.	.31	102.9	12.	.40	98.1	14.	.50	93.5	16.	.59	89.3	18.	.69	85.5	19.	.80	81.5	19.
		1.0	86.7	-4.	.30	75.9	6.	.40	72.9	8.	.49	70.5	10.	.60	67.6	12.	.69	65.5	12.	.80	63.0	11.
	-0.99	0.1	182.3	28.	.30	144.5	43.	.40	135.0	47.	.49	127.6	50.	.61	118.8	52.	.71	111.8	52.	.80	106.9	51.
		0.25	161.9	30.	.30	131.7	43.	.40	124.3	45.	.50	117.5	46.	.59	111.2	49.	.70	105.2	48.	.79	100.1	47.
		0.5	139.3	12.	.30	116.4	26.	.40	110.0	30.	.50	104.2	34.	.60	99.0	37.	.69	94.7	40.	.80	93.0	41.
		1.0	92.2	-0.	.30	92.2	-0.	.40	88.3	4.	.50	84.4	8.	.60	80.8	12.	.70	77.5	16.	.80	74.5	19.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 20

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	431.6	-5.	.30	422.3	-2.	.40	419.0	-1.	.50	415.5	-1.	.60	412.0	-0.	.70	408.5	-3.	.81	404.5	-6.
		0.25	304.8	-3.	.30	296.0	-0.	.40	293.1	1.	.50	290.3	2.	.60	287.5	3.	.69	284.7	2.	.80	281.9	1.
		0.5	195.7	-3.	.30	194.1	-1.	.40	192.6	-0.	.50	191.1	0.	.60	189.7	1.	.70	188.2	2.	.80	186.9	-1.
		1.0	94.9	-4.	.30	93.2	-2.	.40	92.6	-2.	.50	92.0	-2.	.60	91.5	-2.	.70	90.9	-2.	.80	90.4	-2.
	0.0	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.9	-3.	.69	457.9	-3.	.80	455.2	-7.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	334.2	-4.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
	-0.98	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.9	-3.	.70	457.9	-3.	.80	457.9	-3.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	334.2	-4.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
20.	1.0	0.1	315.0	7.	.31	270.9	18.	.40	259.6	19.	.49	248.2	20.	.59	237.6	20.	.70	227.0	20.	.81	216.4	19.
		0.25	226.8	1.	.30	203.1	8.	.40	196.1	10.	.50	189.5	11.	.59	183.7	12.	.70	176.6	12.	.80	170.2	11.
		0.5	153.0	-2.	.30	138.1	5.	.41	133.6	7.	.51	129.4	8.	.62	125.2	8.	.70	122.1	8.	.80	116.7	7.
		1.0	80.0	-7.	.30	75.3	-1.	.39	74.0	1.	.49	72.6	2.	.59	71.2	2.	.70	69.8	2.	.80	68.6	2.
	0.0	0.1	356.3	8.	.30	302.2	22.	.40	286.5	24.	.50	272.0	26.	.61	258.0	26.	.72	244.7	25.	.80	235.3	24.
		0.25	277.5	7.	.30	242.6	17.	.40	232.7	18.	.49	224.1	19.	.60	215.1	20.	.71	206.1	19.	.80	193.8	18.
		0.5	205.5	-2.	.30	188.0	8.	.39	182.5	11.	.50	175.5	13.	.59	169.5	14.	.71	162.3	15.	.81	156.7	13.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.81	101.4	-1.
	-0.98	0.1	383.9	13.	.30	321.3	27.	.40	303.4	32.	.50	287.1	35.	.59	273.7	38.	.72	255.6	40.	.80	246.2	39.
		0.25	315.0	2.	.30	271.7	16.	.40	259.1	20.	.50	247.4	23.	.60	236.6	27.	.70	226.6	30.	.80	217.3	33.
		0.5	215.2	-2.	.30	215.2	-2.	.40	212.6	-1.	.50	204.7	3.	.60	197.4	6.	.70	193.4	9.	.80	183.9	12.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
30.	1.0	0.1	182.9	21.	.30	145.8	35.	.39	137.5	37.	.48	129.7	38.	.57	122.6	38.	.70	115.3	39.	.80	108.6	39.
		0.25	145.9	6.	.30	120.1	18.	.40	113.5	21.	.49	107.8	23.	.60	102.2	25.	.70	97.1	26.	.80	93.0	27.
		0.5	105.6	-2.	.29	91.1	11.	.39	87.1	12.	.49	83.3	15.	.58	80.0	16.	.70	76.3	17.	.81	73.1	17.
		1.0	63.7	-8.	.30	57.6	1.	.40	55.8	3.	.50	54.2	5.	.59	52.8	7.	.70	51.2	8.	.80	43.9	8.
	0.0	0.1	195.1	30.	.30	153.9	45.	.40	143.9	47.	.51	133.9	48.	.61	125.9	48.	.71	118.8	48.	.80	113.0	47.
		0.25	169.0	18.	.31	134.9	32.	.41	127.2	33.	.50	120.3	34.	.60	114.1	35.	.69	103.5	36.	.80	102.7	36.
		0.5	136.1	10.	.31	112.1	22.	.40	106.8	24.	.50	101.8	26.	.60	96.9	27.	.70	92.5	28.	.79	88.7	28.
		1.0	94.2	-5.	.30	81.9	8.	.40	78.6	11.	.49	75.9	12.	.59	72.9	14.	.70	69.9	16.	.80	67.4	16.
	-0.99	0.1	202.0	41.	.30	158.2	54.	.40	147.4	57.	.50	138.0	60.	.60	129.7	62.	.72	120.9	63.	.80	115.5	63.
		0.25	182.9	42.	.30	145.4	54.	.40	136.2	56.	.50	128.4	57.	.60	120.6	59.	.71	113.9	59.	.80	104.3	59.
		0.5	156.8	25.	.30	127.7	39.	.40	120.3	43.	.50	113.6	46.	.60	107.7	49.	.69	102.9	51.	.79	93.2	52.
		1.0	101.4	-0.	.30	100.9	0.	.40	96.0	5.	.50	91.5	9.	.60	87.5	13.	.70	83.5	17.	.80	80.4	20.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 21

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	357.7	-4.	.30	350.3	-2.	.40	347.7	-1.	.51	344.7	-2.	.63	341.6	-4.	.70	339.5	-6.	.80	336.7	-11.
		0.25	253.0	-4.	.30	246.5	-1.	.40	244.3	-1.	.51	241.9	-1.	.62	239.6	-1.	.74	237.0	-3.	.83	235.1	-8.
		0.5	167.8	-4.	.30	164.2	-2.	.40	163.0	-1.	.50	161.9	-1.	.60	160.7	0.	.70	159.6	1.	.79	158.5	-2.
		1.0	97.9	-1.	.30	96.4	1.	.40	95.9	1.	.50	95.4	2.	.60	95.0	2.	.72	94.4	-0.	.81	94.0	-3.
	0.0	0.1	378.1	-2.	.30	378.1	-2.	.40	378.1	-2.	.50	378.1	-2.	.60	378.1	-2.	.70	378.1	-4.	.81	378.1	-11.
		0.25	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	275.1	-3.	.60	275.1	-3.	.70	275.1	-3.	.80	275.1	-3.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
	-0.98	0.1	378.1	-2.	.30	378.1	-2.	.40	378.1	-2.	.50	378.1	-2.	.60	378.1	-2.	.70	378.1	-2.	.80	378.1	-2.
		0.25	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	275.1	-3.	.60	275.1	-3.	.70	275.1	-3.	.80	275.1	-3.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
20.	1.0	0.1	267.9	2.	.31	232.9	13.	.43	220.1	13.	.57	207.2	13.	.57	207.2	13.	.74	193.7	13.	.78	190.4	12.
		0.25	193.3	-3.	.31	173.8	5.	.42	167.1	6.	.55	160.6	7.	.67	154.1	7.	.67	154.1	7.	.78	149.0	6.
		0.5	135.2	-6.	.30	124.9	2.	.40	121.4	4.	.52	118.1	5.	.63	114.8	6.	.78	110.7	4.	.81	110.1	3.
		1.0	83.0	-4.	.30	77.9	3.	.41	76.3	3.	.51	74.7	4.	.63	73.0	4.	.78	71.0	1.	.80	70.7	1.
	0.0	0.1	303.7	5.	.30	260.4	18.	.42	245.5	20.	.50	235.6	20.	.60	224.6	20.	.70	214.8	20.	.79	206.1	18.
		0.25	236.0	2.	.31	207.8	12.	.43	198.4	13.	.50	192.5	13.	.60	185.4	13.	.69	179.3	14.	.80	172.4	12.
		0.5	177.9	-5.	.30	161.4	4.	.41	156.2	6.	.52	150.7	8.	.59	147.3	9.	.70	142.5	9.	.81	138.1	7.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.69	102.7	0.	.82	99.9	-0.
	-0.98	0.1	328.0	11.	.30	278.0	25.	.40	263.2	29.	.50	249.6	33.	.61	235.3	35.	.69	226.3	35.	.80	215.0	34.
		0.25	267.9	-1.	.30	233.6	12.	.40	223.4	16.	.50	213.8	20.	.60	204.9	23.	.70	195.6	26.	.80	189.1	28.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	176.4	-1.	.60	170.4	2.	.70	164.7	5.	.80	159.3	8.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
30.	1.0	0.1	159.6	6.	.31	128.0	23.	.42	119.0	26.	.55	110.5	29.	.55	110.5	29.	.70	101.6	30.	.80	96.5	30.
		0.25	129.4	-4.	.31	108.0	12.	.41	102.2	16.	.54	96.0	18.	.67	90.1	20.	.67	90.1	20.	.79	84.9	21.
		0.5	99.6	-6.	.30	86.1	7.	.42	81.5	10.	.53	77.7	13.	.65	73.8	14.	.65	73.8	14.	.79	69.7	15.
		1.0	65.3	-7.	.30	58.7	4.	.40	56.7	6.	.51	54.9	9.	.63	52.9	9.	.76	50.9	9.	.79	53.5	9.
	0.0	0.1	170.7	17.	.30	135.1	34.	.42	125.0	36.	.51	118.3	37.	.60	112.0	38.	.70	105.8	38.	.81	100.0	38.
		0.25	147.9	5.	.31	120.6	22.	.41	113.1	25.	.51	107.4	26.	.60	102.0	28.	.69	97.5	28.	.80	92.5	29.
		0.5	121.9	1.	.31	102.9	15.	.42	97.4	17.	.50	93.5	19.	.59	89.4	21.	.71	84.8	22.	.80	81.2	23.
		1.0	91.2	-2.	.30	79.0	11.	.41	75.3	13.	.53	71.8	15.	.60	69.9	16.	.69	67.4	17.	.81	64.5	16.
	-0.99	0.1	177.0	33.	.30	139.3	47.	.40	129.9	51.	.50	121.8	54.	.60	114.6	57.	.70	108.1	59.	.80	102.4	60.
		0.25	159.6	36.	.30	128.7	48.	.40	120.5	51.	.52	112.1	53.	.60	107.4	53.	.70	102.0	54.	.80	96.7	53.
		0.5	137.9	21.	.30	114.4	34.	.40	108.1	38.	.50	102.5	41.	.60	97.6	44.	.68	93.6	46.	.80	88.6	46.
		1.0	103.0	0.	.30	94.3	8.	.40	89.8	13.	.50	85.6	17.	.60	81.7	21.	.70	79.2	24.	.80	75.0	27.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD - COLUMN 22

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	472.6	-3.	.30	458.7	0.	.40	453.7	1.	.50	448.6	2.	.62	442.8	1.	.76	435.6	-2.	.78	434.1	-4.
		0.25	323.6	-2.	.30	312.6	1.	.40	309.1	2.	.50	305.4	3.	.61	301.6	3.	.72	297.6	2.	.79	295.5	2.
		0.5	207.6	-2.	.30	201.9	1.	.40	200.0	1.	.50	198.2	2.	.60	196.4	3.	.70	194.6	4.	.79	193.1	3.
		1.0	108.3	-2.	.30	106.0	0.	.40	105.3	1.	.50	104.5	1.	.60	103.8	2.	.70	103.1	2.	.78	102.5	1.
	0.0	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	508.9	-3.	.60	504.2	-2.	.70	499.4	-1.	.81	494.0	-5.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	361.5	-3.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
	-0.98	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	510.0	-3.	.60	510.0	-3.	.70	510.0	-3.	.80	510.0	-3.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	361.5	-3.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.60	116.8	1.
20.	1.0	0.1	318.3	11.	.30	269.5	23.	.43	253.3	24.	.57	236.6	25.	.57	236.6	25.	.74	229.3	25.	.81	221.9	24.
		0.25	231.0	1.	.31	208.4	11.	.42	194.5	13.	.54	185.8	14.	.54	185.8	14.	.67	177.4	15.	.81	169.0	15.
		0.5	160.4	-2.	.30	146.1	7.	.41	140.7	9.	.53	135.2	10.	.55	130.0	10.	.72	127.2	10.	.80	124.0	9.
		1.0	83.4	-4.	.30	83.7	3.	.41	81.9	4.	.51	80.1	5.	.62	78.4	6.	.75	76.0	5.	.81	75.7	5.
	0.0	0.1	358.7	15.	.30	298.0	29.	.40	281.4	32.	.51	265.9	33.	.61	252.4	33.	.71	239.9	32.	.80	229.6	31.
		0.25	281.3	10.	.31	242.3	21.	.40	232.3	22.	.49	223.0	23.	.60	213.1	23.	.70	204.0	24.	.81	195.5	23.
		0.5	212.3	0.	.30	188.9	11.	.39	182.5	14.	.48	176.9	15.	.59	170.2	17.	.70	164.3	17.	.61	158.4	17.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	113.9	3.	.61	110.6	4.
	-0.98	0.1	385.1	22.	.30	315.4	36.	.40	296.7	40.	.50	279.9	43.	.59	266.4	46.	.73	247.7	47.	.79	239.6	47.
		0.25	318.3	9.	.30	270.2	23.	.40	256.8	27.	.50	244.4	30.	.50	233.2	33.	.70	222.8	36.	.80	213.1	39.
		0.5	228.1	-2.	.30	222.0	0.	.40	212.6	5.	.50	204.0	9.	.60	196.0	12.	.70	188.6	15.	.60	181.6	19.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.50	116.8	1.	.70	116.8	1.	.80	116.8	1.
30.	1.0	0.1	177.8	20.	.32	139.7	32.	.45	128.5	34.	.45	128.5	34.	.59	118.0	37.	.75	108.0	39.	.80	105.4	39.
		0.25	146.4	2.	.31	119.2	19.	.42	111.8	22.	.54	104.7	25.	.67	98.0	27.	.67	98.0	27.	.79	92.3	28.
		0.5	109.5	-2.	.30	93.1	11.	.41	88.4	15.	.53	83.9	18.	.65	79.6	19.	.73	77.2	20.	.81	74.9	19.
		1.0	70.0	-5.	.31	62.7	4.	.41	60.6	6.	.53	58.4	8.	.55	56.4	9.	.77	54.4	10.	.80	53.9	10.
	0.0	0.1	168.9	32.	.30	148.5	46.	.41	138.1	47.	.51	129.3	48.	.61	121.9	48.	.70	115.2	48.	.81	108.9	48.
		0.25	165.9	15.	.32	132.3	29.	.40	125.5	31.	.49	118.7	34.	.60	111.5	36.	.70	105.5	36.	.80	100.5	37.
		0.5	137.6	6.	.30	113.3	22.	.40	107.2	25.	.50	101.9	27.	.50	96.7	28.	.69	92.4	29.	.80	83.0	30.
		1.0	98.9	0.	.30	85.3	13.	.40	81.6	15.	.49	78.7	17.	.60	75.3	19.	.70	72.5	20.	.79	69.9	20.
	-0.98	0.1	195.0	45.	.30	152.6	57.	.40	142.2	60.	.50	133.0	63.	.60	125.0	65.	.69	118.5	67.	.80	111.7	68.
		0.25	177.8	45.	.30	141.7	56.	.39	133.3	59.	.50	124.4	61.	.60	117.1	61.	.69	111.7	62.	.80	105.2	61.
		0.5	155.6	30.	.30	126.4	43.	.40	118.9	47.	.50	112.2	50.	.60	106.2	52.	.70	100.9	54.	.80	96.1	54.
		1.0	116.8	1.	.30	102.6	13.	.40	97.4	17.	.50	92.7	21.	.60	89.5	25.	.70	84.7	28.	.80	81.2	31.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD -- COLUMN 23

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	381.1	-4.	.30	377.0	-3.	.40	375.5	-2.	.51	373.9	-4.	.62	372.2	-5.	.75	370.1	-9.	.79	369.4	-12.
		0.25	285.7	-5.	.30	281.0	-3.	.40	279.4	-2.	.50	277.8	-2.	.61	276.1	-3.	.72	274.3	-4.	.79	273.4	-6.
		0.5	197.8	-5.	.30	194.8	-3.	.40	193.8	-3.	.50	192.8	-2.	.60	191.8	-1.	.70	190.8	-1.	.80	189.8	-0.
		1.0	122.7	-4.	.30	121.3	-3.	.40	120.9	-2.	.50	120.4	-2.	.60	120.0	-2.	.70	119.5	-1.	.80	119.1	-3.
	0.0	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	393.0	-2.	.70	393.0	-3.	.79	393.0	-7.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	300.9	-3.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
	-0.98	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	393.0	-2.	.70	393.0	-2.	.80	393.0	-2.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	300.9	-3.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
20.	1.0	0.1	326.8	-4.	.31	299.2	2.	.43	288.2	2.	.43	288.2	2.	.56	276.8	1.	.70	264.5	1.	.80	256.8	-1.
		0.25	239.1	-5.	.31	221.3	-0.	.42	215.1	0.	.54	208.7	1.	.66	202.5	1.	.77	197.4	-0.	.78	196.6	-1.
		0.5	169.8	-7.	.30	160.0	-1.	.41	156.7	0.	.52	153.5	1.	.62	150.4	2.	.76	146.5	-0.	.80	145.5	-1.
		1.0	109.1	-6.	.30	103.6	-1.	.40	101.9	0.	.51	100.0	1.	.63	98.2	1.	.76	96.2	-1.	.80	95.5	-2.
	0.0	0.1	366.6	-3.	.31	335.8	4.	.41	325.3	4.	.50	315.7	4.	.60	304.5	4.	.70	293.7	4.	.81	283.1	0.
		0.25	290.0	-4.	.30	266.7	3.	.40	259.2	4.	.50	251.9	4.	.59	245.2	4.	.70	238.0	4.	.80	231.4	2.
		0.5	208.1	-4.	.30	205.3	-2.	.39	201.0	0.	.49	196.3	2.	.59	191.6	3.	.69	187.1	3.	.81	182.0	1.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
	-0.98	0.1	391.9	-2.	.30	361.5	6.	.40	349.7	9.	.50	337.5	13.	.60	325.1	14.	.70	312.7	15.	.81	300.8	12.
		0.25	300.9	-3.	.30	299.9	-3.	.40	290.9	0.	.50	281.9	3.	.60	273.2	6.	.70	264.7	9.	.80	256.4	12.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
30.	1.0	0.1	223.1	5.	.31	183.7	20.	.43	171.1	22.	.57	158.7	23.	.57	158.7	23.	.74	145.7	23.	.80	141.1	23.
		0.25	175.9	-3.	.31	150.7	8.	.43	142.8	10.	.56	134.6	12.	.56	134.6	12.	.70	126.9	14.	.81	121.4	15.
		0.5	134.0	-7.	.31	118.9	3.	.42	114.4	5.	.54	109.1	7.	.65	104.5	9.	.72	102.1	10.	.80	99.1	10.
		1.0	89.3	-5.	.31	81.0	2.	.41	78.5	4.	.53	75.9	6.	.55	73.4	6.	.65	73.4	6.	.79	73.6	6.
	0.0	0.1	242.7	10.	.30	196.8	27.	.40	185.0	30.	.50	173.6	31.	.61	163.8	31.	.71	154.6	31.	.79	148.4	31.
		0.25	203.9	6.	.31	170.3	18.	.41	161.9	19.	.50	154.7	21.	.59	147.7	21.	.70	140.0	22.	.79	134.5	22.
		0.5	165.2	-1.	.31	143.0	10.	.41	137.0	12.	.49	132.0	13.	.59	126.6	14.	.69	121.9	16.	.81	116.5	16.
		1.0	122.9	-7.	.30	110.0	4.	.39	106.0	7.	.49	102.2	9.	.60	98.5	11.	.67	95.8	12.	.79	92.2	11.
	-0.98	0.1	254.9	22.	.30	203.9	37.	.40	190.9	41.	.50	179.5	45.	.61	167.8	46.	.69	160.7	47.	.80	151.5	47.
		0.25	223.1	23.	.30	184.4	37.	.40	174.3	39.	.50	164.9	41.	.59	156.6	42.	.69	148.8	43.	.81	140.9	42.
		0.5	185.6	7.	.30	160.7	20.	.40	153.0	24.	.50	145.8	29.	.60	139.3	31.	.69	133.9	34.	.81	127.0	36.
		1.0	127.4	-2.	.30	127.4	-2.	.40	125.1	-0.	.50	120.3	4.	.60	115.9	7.	.70	111.6	11.	.80	107.4	14.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD -- COLUMN 24

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR	P_S/P	P_{ACI}	ERR
10.	1.0	0.1	503.5	-5.	.30	495.3	-3.	.40	492.4	-2.	.50	489.4	-2.	.61	486.2	-2.	.73	462.4	-5.	.80	450.3	-7.
		0.25	365.5	-4.	.30	357.4	-2.	.40	354.6	-1.	.50	351.9	0.	.60	349.2	1.	.71	346.3	0.	.79	344.0	-1.
		0.5	245.4	-3.	.30	240.7	-1.	.40	239.2	-1.	.50	237.6	0.	.60	236.1	1.	.70	234.6	1.	.80	233.1	2.
		1.0	139.1	-2.	.30	136.6	0.	.40	135.8	0.	.51	135.0	0.	.61	134.2	0.	.72	133.4	0.	.81	132.8	-1.
	0.0	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.5	-3.	.69	526.5	-3.	.80	526.5	-6.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.60	392.4	-3.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
	-0.98	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.5	-3.	.70	526.5	-3.	.80	526.5	-3.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	392.4	-3.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
20.	1.0	0.1	399.6	1.	.31	353.2	10.	.43	336.6	11.	.55	319.9	12.	.55	319.9	12.	.70	301.9	12.	.79	291.8	11.
		0.25	285.5	-2.	.31	261.8	5.	.42	252.6	6.	.54	243.9	7.	.66	235.1	9.	.66	235.1	8.	.80	226.1	7.
		0.5	203.3	-4.	.30	189.2	3.	.40	184.9	4.	.52	180.3	5.	.63	175.4	6.	.77	169.0	5.	.81	167.4	4.
		1.0	118.1	-5.	.30	111.5	1.	.40	109.3	2.	.51	107.2	3.	.62	105.2	3.	.74	102.9	3.	.79	102.0	2.
	0.0	0.1	452.2	1.	.30	396.4	13.	.40	379.3	15.	.50	363.3	16.	.60	347.2	17.	.71	331.5	16.	.80	317.8	15.
		0.25	352.3	1.	.30	315.1	10.	.40	304.2	12.	.49	294.2	12.	.60	283.7	13.	.70	273.4	13.	.81	263.6	12.
		0.5	261.9	-4.	.30	243.0	4.	.39	236.7	6.	.49	229.9	8.	.59	223.6	10.	.70	217.4	11.	.80	211.3	10.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
	-0.98	0.1	487.3	5.	.30	425.3	17.	.40	405.1	21.	.50	385.8	25.	.59	369.3	28.	.72	348.4	29.	.60	335.4	29.
		0.25	392.4	-3.	.30	354.4	7.	.40	340.3	11.	.50	326.9	14.	.50	314.3	18.	.70	302.3	21.	.60	291.0	24.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	259.2	-1.	.70	251.1	2.	.60	243.4	5.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.50	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
30.	1.0	0.1	248.0	14.	.31	200.7	29.	.43	186.3	31.	.57	171.9	32.	.57	171.9	32.	.74	156.6	33.	.79	152.2	33.
		0.25	199.7	2.	.31	166.9	14.	.44	156.2	17.	.56	146.8	20.	.56	146.8	20.	.69	137.4	22.	.79	131.5	23.
		0.5	150.0	-2.	.31	129.0	10.	.41	123.0	12.	.54	116.8	14.	.67	110.9	16.	.74	107.9	16.	.81	105.0	17.
		1.0	94.6	-6.	.30	85.6	4.	.40	83.0	7.	.51	80.2	8.	.62	77.7	9.	.75	74.9	10.	.80	74.0	10.
	0.0	0.1	266.7	21.	.30	212.9	37.	.39	200.2	40.	.51	186.2	41.	.51	175.9	42.	.71	166.0	41.	.80	158.3	41.
		0.25	228.9	13.	.31	187.6	26.	.40	178.2	27.	.50	166.8	29.	.60	159.3	30.	.69	151.9	31.	.80	144.5	31.
		0.5	188.2	4.	.31	158.0	16.	.41	150.5	19.	.49	143.8	21.	.60	136.8	23.	.69	131.0	24.	.79	125.4	25.
		1.0	135.1	-2.	.31	117.6	10.	.40	113.4	12.	.49	109.1	14.	.60	104.8	15.	.69	101.2	17.	.80	97.5	17.
	-0.98	0.1	277.6	32.	.30	219.4	46.	.40	204.9	50.	.50	192.2	53.	.60	180.9	56.	.72	168.5	57.	.80	161.9	57.
		0.25	248.0	34.	.30	201.4	46.	.40	189.5	49.	.50	178.8	53.	.59	169.4	52.	.70	159.7	53.	.61	151.3	52.
		0.5	213.1	17.	.30	178.5	30.	.40	168.4	34.	.50	159.4	39.	.60	151.3	41.	.70	143.9	44.	.80	137.2	40.
		1.0	147.8	-1.	.30	143.0	3.	.40	136.2	7.	.50	130.0	12.	.60	124.4	15.	.70	119.2	19.	.80	114.5	22.

APPENDIX G

COLUMN CAPACITIES AND ASSOCIATED ERRORS BY USING EQN. 5.14 AS A DIRECT MOMENT MAGNIFICATION METHOD

Tables G1 to G24 give values of column capacities predicted by using Eqn. 5.14 and the ACI Rectangular Stress Block, excluding the capacity reduction factor. Errors associated with these results are also included in the tables. These were calculated by comparing the predicted capacities with those of the analytical method (Appendix C) by using Eqn. 5.3.

The following notation is used in the tables:

P_{EQ}	column capacity (kips) predicted by using Eqn. 5.4 and the ACI Rectangular Stress Block, excluding the capacity reduction factor
ERR	Error, as a percentage, calculated by Eqn. 5.3
P_S/P_{AN}	ratio of sustained load to ultimate load (P_{sus}/P_{an} in text)
E/H	ratio of eccentricity to section depth (e/h in text)
E_1/E_2	ratio of end eccentricities (e_1/e_2 in text)
L/H	ratio of column length to section depth (L/h in text)

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 1

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	217.4	-7.	.30	211.3	-4.	.40	208.0	-2.	.50	203.8	-1.	.60	197.4	-3.	.70	189.0	-4.	.78	177.3	-5.
		0.25	142.5	-8.	.30	137.5	-4.	.40	135.1	-2.	.50	132.3	-1.	.59	128.7	-1.	.76	119.8	-4.	.79	117.1	-5.
		0.5	67.8	-4.	.31	64.5	-2.	.43	62.8	-1.	.51	61.5	-1.	.62	59.4	-1.	.69	57.8	0.	.80	54.9	2.
		1.0	22.8	-6.	.29	22.5	-6.	.40	22.3	-6.	.51	22.2	-7.	.60	22.1	-8.	.70	21.9	-7.	.81	22.7	-7.
	0.0	0.1	232.7	-5.	.30	228.9	-3.	.40	226.3	-2.	.50	222.8	-0.	.60	218.0	2.	.68	211.9	1.	.79	199.1	-1.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	158.8	-6.	.60	155.0	-3.	.73	148.0	1.	.73	144.8	3.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
	-0.98	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	232.7	-5.	.60	232.7	-5.	.70	232.7	-5.	.80	232.7	-5.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.70	159.3	-6.	.80	159.3	-6.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
20.	1.0	0.1	167.1	-5.	.32	151.5	-4.	.41	145.2	-5.	.52	137.2	-7.	.66	125.8	-8.	.70	121.8	-9.	.83	101.3	-3.
		0.25	97.4	-6.	.31	84.0	0.	.43	77.8	3.	.55	70.6	6.	.61	66.2	8.	.69	60.5	11.	.79	52.8	16.
		0.5	42.3	5.	.33	37.9	8.	.41	36.7	8.	.52	35.0	9.	.64	33.1	11.	.69	32.1	11.	.79	30.5	13.
		1.0	18.4	2.	.30	17.9	-1.	.41	17.7	-3.	.50	17.5	-3.	.61	17.3	-3.	.70	17.1	-4.	.80	16.8	-3.
	0.0	0.1	191.9	-2.	.31	178.2	3.	.42	171.5	1.	.47	167.6	-0.	.58	158.9	-3.	.70	147.7	-8.	.81	134.6	-9.
		0.25	129.2	4.	.33	117.7	4.	.42	112.8	4.	.51	106.9	5.	.61	99.7	5.	.70	92.0	6.	.80	83.0	8.
		0.5	68.5	11.	.32	61.0	14.	.41	58.7	15.	.50	56.3	16.	.61	53.3	16.	.70	50.4	17.	.81	46.8	17.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.61	25.0	-3.	.71	24.8	-3.	.80	24.5	-3.
	-0.98	0.1	230.7	-4.	.30	221.6	-0.	.40	217.4	2.	.50	212.4	4.	.60	205.9	4.	.68	199.8	2.	.81	187.3	-4.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	158.7	-6.	.70	152.5	-2.	.81	144.6	-3.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.9	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
30.	1.0	0.1	96.3	10.	.31	76.6	14.	.40	70.6	14.	.53	61.4	17.	.63	53.7	21.	.69	49.5	24.	.83	40.7	30.
		0.25	45.1	18.	.33	36.8	23.	.43	34.1	24.	.55	31.2	27.	.57	28.5	30.	.71	27.5	30.	.80	25.4	32.
		0.5	25.3	17.	.31	22.9	15.	.42	22.1	17.	.51	21.3	16.	.63	20.3	17.	.71	19.6	18.	.80	18.8	18.
		1.0	14.2	8.	.32	13.8	3.	.39	13.7	2.	.51	13.5	2.	.59	13.4	1.	.71	13.3	-2.	.80	13.4	-3.
	0.0	0.1	128.4	6.	.28	113.3	9.	.41	104.0	8.	.51	95.7	8.	.59	88.9	8.	.72	76.7	10.	.83	65.5	14.
		0.25	72.7	17.	.32	59.2	18.	.38	56.3	18.	.50	51.3	20.	.61	46.7	22.	.71	42.6	25.	.79	39.2	26.
		0.5	38.7	25.	.29	34.9	23.	.39	33.5	23.	.51	31.9	23.	.61	30.5	23.	.70	29.2	23.	.79	27.9	23.
		1.0	20.3	13.	.32	19.7	9.	.40	19.5	9.	.50	19.3	8.	.60	19.1	7.	.69	18.9	7.	.80	16.7	5.
	-0.98	0.1	181.4	-4.	.30	167.4	4.	.40	161.8	8.	.51	154.9	8.	.61	147.9	6.	.69	142.4	3.	.80	133.7	-1.
		0.25	136.7	6.	.31	125.7	10.	.41	121.6	9.	.51	116.3	9.	.62	109.0	8.	.70	103.5	5.	.81	95.4	5.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.63	76.5	-1.	.72	73.3	-2.	.80	76.3	-3.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 2

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	342.3	-7.	.30	332.3	-4.	.40	327.0	-2.	.50	319.9	0.	.60	310.2	2.	.70	295.1	2.	.82	262.8	6.
		0.25	215.3	-7.	.30	206.5	-3.	.40	202.4	-1.	.50	197.3	1.	.61	190.0	2.	.71	178.2	2.	.80	164.2	5.
		0.5	83.0	-6.	.31	78.2	-4.	.41	76.3	-2.	.51	74.0	-1.	.61	71.5	0.	.70	68.8	2.	.80	65.5	4.
		1.0	25.6	-9.	.31	25.2	-11.	.40	25.0	-11.	.51	24.9	-12.	.61	24.7	-11.	.72	24.5	-11.	.79	24.3	-12.
	0.0	0.1	367.4	-5.	.30	361.1	-3.	.40	356.9	-2.	.50	351.3	-1.	.60	343.2	2.	.69	332.4	5.	.81	307.1	7.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	243.5	-5.	.60	237.0	-2.	.70	228.3	2.	.80	216.3	7.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
	-0.99	0.1	367.4	-5.	.30	367.4	-5.	.40	367.4	-5.	.50	367.4	-5.	.60	367.4	-5.	.70	367.4	-5.	.80	367.4	-5.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	244.2	-5.	.80	244.2	-5.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
20.	1.0	0.1	257.8	-4.	.31	231.4	2.	.41	220.4	2.	.51	207.5	3.	.63	190.5	3.	.70	175.4	6.	.80	150.2	12.
		0.25	132.7	-2.	.32	109.2	7.	.43	98.7	12.	.54	87.7	18.	.67	74.8	25.	.71	70.7	27.	.80	61.6	32.
		0.5	48.9	7.	.32	43.7	8.	.41	42.0	10.	.51	40.1	11.	.62	37.9	13.	.69	36.4	14.	.78	34.6	17.
		1.0	20.5	-2.	.30	19.9	-5.	.40	19.7	-5.	.50	19.5	-5.	.61	19.2	-7.	.68	19.1	-6.	.81	18.7	-7.
	0.0	0.1	300.0	-2.	.30	277.3	6.	.40	267.3	7.	.50	254.8	6.	.62	237.9	5.	.70	224.8	4.	.80	205.3	5.
		0.25	192.3	6.	.30	170.2	12.	.42	159.5	14.	.49	151.0	15.	.60	137.8	18.	.70	123.9	21.	.79	109.1	25.
		0.5	84.0	14.	.31	73.9	19.	.41	70.5	21.	.50	67.0	23.	.60	63.3	24.	.70	59.3	26.	.80	55.3	28.
		1.0	28.1	-1.	.30	28.1	-2.	.40	28.1	-3.	.52	28.1	-4.	.62	28.1	-5.	.70	28.0	-6.	.80	27.5	-5.
	-0.98	0.1	364.0	-5.	.30	349.2	-0.	.40	342.4	2.	.50	334.2	4.	.59	325.2	7.	.73	306.7	7.	.81	293.2	5.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	243.3	-4.	.70	232.5	0.	.80	219.9	6.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
30.	1.0	0.1	130.7	21.	.31	98.0	33.	.40	87.0	36.	.51	75.5	40.	.61	65.5	44.	.71	56.5	47.	.79	49.9	50.
		0.25	52.3	27.	.31	42.4	30.	.42	39.2	32.	.53	36.0	35.	.64	32.9	38.	.70	31.3	39.	.79	28.9	42.
		0.5	28.5	20.	.32	25.6	17.	.42	24.7	18.	.51	23.9	19.	.63	22.7	20.	.71	21.9	20.	.80	21.1	22.
		1.0	15.8	6.	.31	15.3	-0.	.43	15.2	-1.	.51	15.0	-2.	.60	14.9	-3.	.70	14.7	-3.	.80	14.6	-4.
	0.0	0.1	190.8	10.	.30	158.7	21.	.42	142.1	23.	.51	129.4	26.	.61	113.8	29.	.72	96.7	34.	.81	81.8	39.
		0.25	90.6	32.	.31	71.7	36.	.40	66.4	37.	.50	60.3	39.	.60	54.7	41.	.71	49.2	42.	.80	44.6	44.
		0.5	44.4	33.	.32	39.2	29.	.42	37.6	30.	.50	36.3	30.	.60	34.6	31.	.70	33.0	31.	.81	31.1	32.
		1.0	22.7	10.	.32	22.0	7.	.40	21.8	7.	.50	21.6	6.	.59	21.3	6.	.70	21.1	5.	.80	20.8	4.
	-0.98	0.1	282.3	-4.	.30	258.3	5.	.40	248.6	8.	.49	239.0	12.	.60	225.8	15.	.69	214.2	14.	.81	198.1	12.
		0.25	205.2	8.	.30	185.8	16.	.40	176.4	18.	.50	166.3	19.	.60	155.3	21.	.71	142.7	21.	.80	130.5	22.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.62	97.4	3.	.71	92.0	5.	.80	86.5	6.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 3

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	222.1	-6.	.30	216.5	-4.	.40	213.5	-2.	.50	209.4	-1.	.60	204.0	-1.	.69	196.9	-2.	.80	181.9	-3.
		0.25	153.2	-6.	.30	148.4	-3.	.40	146.1	-1.	.50	143.3	0.	.59	140.0	2.	.72	133.2	-0.	.79	127.6	-0.
		0.5	79.0	-2.	.31	75.8	0.	.41	74.3	1.	.51	72.8	1.	.61	70.9	2.	.69	69.1	2.	.79	66.3	3.
		1.0	27.4	-3.	.30	26.9	-2.	.40	26.8	-1.	.50	26.6	-0.	.61	26.4	-1.	.69	26.2	0.	.81	25.9	0.
	0.0	0.1	236.3	-5.	.30	232.7	-3.	.40	230.3	-2.	.50	227.2	-1.	.60	222.7	1.	.72	213.5	0.	.80	203.3	-1.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.4	-5.	.60	164.9	-3.	.70	160.2	-0.	.80	153.7	4.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
	-0.98	0.1	236.3	-5.	.30	236.3	-5.	.40	236.3	-5.	.50	236.3	-5.	.60	236.3	-5.	.70	235.3	-5.	.80	236.3	-5.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.8	-5.	.70	168.8	-5.	.80	168.8	-5.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
20.	1.0	0.1	176.0	-5.	.30	162.3	-2.	.40	156.4	-3.	.51	149.0	-4.	.62	140.7	-6.	.71	131.2	-7.	.79	118.7	-2.
		0.25	108.5	-1.	.30	95.8	5.	.40	90.6	8.	.52	83.3	9.	.65	75.0	12.	.70	71.5	13.	.80	63.1	17.
		0.5	52.0	9.	.31	46.9	11.	.42	45.0	12.	.53	43.0	13.	.63	40.8	14.	.70	39.3	15.	.80	37.1	17.
		1.0	21.6	5.	.30	21.0	8.	.40	20.7	8.	.49	20.5	8.	.59	20.2	8.	.71	19.9	7.	.80	19.7	7.
	0.0	0.1	198.8	-2.	.31	186.2	2.	.41	180.3	1.	.51	173.9	-1.	.62	165.1	-5.	.72	155.9	-8.	.81	146.5	-9.
		0.25	140.5	4.	.29	130.0	7.	.40	124.2	7.	.50	118.7	8.	.62	110.3	8.	.71	102.3	9.	.80	94.5	9.
		0.5	79.6	11.	.29	73.2	15.	.39	70.5	16.	.50	67.6	17.	.61	64.3	17.	.71	60.8	17.	.80	57.8	17.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.1	0.	.80	29.6	2.
	-0.98	0.1	234.3	-4.	.30	226.1	-0.	.40	222.2	1.	.50	217.6	3.	.61	211.1	3.	.69	205.3	0.	.80	196.0	-4.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.3	-5.	.70	162.5	-2.	.80	155.6	-0.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
30.	1.0	0.1	107.4	12.	.33	86.5	15.	.45	78.5	16.	.51	74.3	18.	.58	68.6	20.	.73	57.6	25.	.79	52.5	28.
		0.25	55.2	23.	.32	45.4	27.	.43	42.1	29.	.55	38.4	32.	.61	36.4	33.	.69	34.3	35.	.80	30.7	37.
		0.5	30.7	22.	.31	27.5	26.	.41	26.5	25.	.52	25.3	27.	.54	24.0	27.	.69	23.4	28.	.79	22.3	28.
		1.0	16.4	14.	.30	15.9	14.	.40	15.7	14.	.49	15.6	15.	.58	15.4	14.	.71	15.2	13.	.60	15.1	12.
	0.0	0.1	139.7	5.	.28	124.0	8.	.42	113.7	8.	.51	106.5	7.	.51	97.8	8.	.69	90.3	8.	.78	81.7	10.
		0.25	83.9	20.	.27	72.5	21.	.42	65.8	22.	.50	62.1	23.	.61	57.3	25.	.72	51.9	26.	.80	47.7	28.
		0.5	47.7	28.	.28	43.1	28.	.40	40.9	28.	.50	39.2	28.	.61	37.4	28.	.71	35.4	28.	.82	33.6	27.
		1.0	24.1	16.	.28	23.4	18.	.39	23.1	18.	.49	22.8	18.	.60	22.6	17.	.69	22.3	17.	.79	22.0	16.
	-0.98	0.1	189.1	-2.	.31	175.9	3.	.42	170.3	4.	.51	165.1	4.	.61	158.6	3.	.69	152.8	-1.	.81	143.7	-6.
		0.25	147.7	5.	.31	137.2	10.	.41	132.6	10.	.50	127.4	10.	.61	121.0	9.	.73	112.9	6.	.80	107.2	5.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	88.8	1.	.73	84.0	1.	.81	80.8	-1.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 4

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	347.0	-6.	.30	337.6	-4.	.40	332.6	-2.	.50	326.0	0.	.61	315.9	2.	.69	304.3	2.	.82	273.7	7.
		0.25	228.8	-6.	.30	226.5	-2.	.40	216.6	-0.	.50	211.4	2.	.61	202.1	4.	.70	192.5	4.	.81	175.9	7.
		0.5	97.5	-4.	.30	92.6	-1.	.41	90.4	-0.	.50	88.0	1.	.60	85.3	2.	.70	81.9	4.	.80	78.1	6.
		1.0	28.4	-2.	.30	27.9	-1.	.40	27.8	-1.	.51	27.6	-0.	.60	27.4	0.	.71	27.1	1.	.80	26.9	1.
	0.0	0.1	370.8	-5.	.30	364.8	-3.	.40	360.9	-2.	.50	355.5	-1.	.60	347.9	1.	.69	337.6	4.	.80	316.9	6.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.0	-5.	.60	248.9	-2.	.70	246.8	1.	.80	229.7	6.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
	-0.98	0.1	370.8	-5.	.30	370.8	-5.	.40	370.8	-5.	.50	370.8	-5.	.60	370.8	-5.	.70	370.8	-5.	.80	370.8	-5.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	255.7	-5.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
20.	1.0	0.1	268.3	-4.	.29	245.3	1.	.39	235.8	2.	.48	225.9	2.	.62	205.8	3.	.70	188.7	6.	.80	163.5	12.
		0.25	146.5	3.	.30	124.7	11.	.41	115.3	15.	.51	105.3	13.	.60	96.6	22.	.70	85.2	27.	.80	74.0	32.
		0.5	58.2	10.	.29	52.1	15.	.39	49.8	17.	.49	47.6	19.	.60	44.7	21.	.70	42.1	23.	.80	39.2	26.
		1.0	22.3	7.	.30	21.7	8.	.41	21.4	8.	.51	21.1	9.	.61	20.8	10.	.70	20.6	9.	.79	20.3	11.
	0.0	0.1	307.4	-2.	.30	286.4	5.	.40	277.2	6.	.50	265.8	5.	.62	250.5	4.	.70	237.6	3.	.81	216.2	3.
		0.25	205.2	6.	.31	182.3	14.	.41	173.6	15.	.50	164.1	17.	.60	151.2	19.	.72	135.3	22.	.81	120.0	25.
		0.5	93.5	14.	.31	87.7	20.	.40	83.9	22.	.50	80.0	23.	.60	75.7	25.	.71	70.3	27.	.80	65.8	23.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.4	1.	.80	30.8	3.
	-0.98	0.1	367.6	-4.	.30	353.6	-0.	.40	347.1	1.	.50	339.4	4.	.59	330.8	6.	.73	313.9	6.	.80	303.1	5.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	254.8	-4.	.70	244.8	-0.	.80	233.0	5.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
30.	1.0	0.1	144.6	20.	.29	114.2	29.	.37	105.2	31.	.47	94.7	34.	.59	80.1	40.	.74	64.4	46.	.81	57.7	49.
		0.25	62.4	32.	.30	50.6	37.	.39	46.9	39.	.50	43.0	42.	.61	38.8	46.	.70	35.5	48.	.80	32.1	51.
		0.5	32.0	28.	.30	28.6	30.	.40	27.5	31.	.49	26.5	33.	.61	25.1	35.	.72	23.9	35.	.81	22.9	36.
		1.0	16.8	17.	.31	16.3	15.	.40	16.2	16.	.51	16.0	16.	.60	15.8	16.	.70	15.7	15.	.81	15.5	15.
	0.0	0.1	203.3	9.	.33	168.2	18.	.42	156.3	20.	.51	144.2	22.	.59	132.0	25.	.73	116.5	30.	.80	99.1	33.
		0.25	105.3	30.	.28	86.6	35.	.39	79.3	37.	.50	72.3	39.	.61	65.2	42.	.72	58.0	44.	.80	52.9	46.
		0.5	52.5	36.	.29	46.5	37.	.40	44.2	38.	.49	42.2	39.	.60	39.9	40.	.71	37.6	40.	.81	35.4	41.
		1.0	24.9	17.	.30	24.1	19.	.39	23.9	19.	.49	23.6	19.	.59	23.3	20.	.69	23.0	20.	.80	22.7	20.
	-0.98	0.1	291.0	-3.	.30	268.7	5.	.40	259.8	8.	.51	249.3	11.	.61	237.6	11.	.70	227.5	10.	.82	210.9	8.
		0.25	219.3	7.	.30	198.4	16.	.40	189.4	18.	.50	179.8	19.	.61	167.9	20.	.70	157.5	21.	.79	142.2	21.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	113.2	3.	.71	106.9	6.	.80	100.9	7.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 5

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	258.2	-6.	.30	251.4	-3.	.40	247.8	-2.	.50	243.2	-1.	.60	236.6	-1.	.71	224.9	-2.	.79	212.3	-3.
		0.25	177.9	-6.	.30	172.5	-3.	.40	170.0	-1.	.49	167.1	1.	.61	162.6	1.	.70	157.6	2.	.82	149.4	-2.
		0.5	113.4	-4.	.30	110.1	-1.	.40	108.7	0.	.51	106.9	1.	.60	105.0	1.	.74	101.6	-3.	.78	100.2	-3.
		1.0	48.5	-1.	.30	47.9	0.	.40	47.6	1.	.51	47.3	0.	.60	47.1	-0.	.70	46.7	-0.	.79	46.4	-1.
	0.0	0.1	275.6	-4.	.30	271.2	-2.	.40	268.3	-1.	.50	264.4	0.	.60	258.9	2.	.69	251.1	2.	.80	235.7	-0.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.0	-5.	.60	191.0	-3.	.70	185.7	0.	.79	179.0	3.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
	-0.98	0.1	275.6	-4.	.30	275.6	-4.	.40	275.6	-4.	.50	275.6	-4.	.60	275.6	-4.	.70	275.6	-4.	.80	275.6	-4.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	195.4	-5.	.70	195.4	-5.	.80	195.4	-5.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
20.	1.0	0.1	203.6	-3.	.31	187.5	-2.	.42	180.4	-3.	.52	172.4	-3.	.61	164.8	-4.	.70	155.7	-4.	.80	143.2	-4.
		0.25	136.9	-6.	.30	127.4	-3.	.40	123.3	-2.	.50	119.2	-1.	.61	111.8	1.	.72	103.1	2.	.81	95.9	2.
		0.5	83.2	-0.	.31	76.9	4.	.41	74.6	4.	.53	71.4	5.	.60	69.5	5.	.70	66.6	5.	.80	63.1	4.
		1.0	39.5	2.	.30	38.5	4.	.41	38.0	4.	.51	37.6	2.	.59	37.3	2.	.69	36.8	2.	.81	36.3	1.
	0.0	0.1	230.1	-0.	.31	214.9	2.	.41	209.1	1.	.50	202.5	1.	.63	190.8	-3.	.73	180.3	-5.	.80	171.0	-6.
		0.25	163.8	4.	.31	152.8	6.	.41	148.8	5.	.48	145.2	5.	.61	138.5	4.	.72	131.6	2.	.80	120.6	0.
		0.5	114.1	2.	.30	107.0	8.	.39	104.4	8.	.49	101.6	8.	.60	97.9	9.	.73	93.0	6.	.80	90.1	4.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.7	1.	.81	51.9	1.
	-0.98	0.1	273.2	-3.	.30	263.0	1.	.40	258.3	3.	.50	252.7	5.	.62	244.3	3.	.69	238.1	1.	.80	226.7	-4.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	194.8	-5.	.70	188.3	-1.	.79	181.4	-3.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
30.	1.0	0.1	136.0	0.	.31	121.6	-0.	.44	113.3	-2.	.56	104.3	-0.	.60	101.0	1.	.69	93.0	5.	.82	81.2	10.
		0.25	87.0	2.	.32	75.0	9.	.43	70.4	11.	.54	65.7	14.	.61	62.6	15.	.70	58.2	18.	.82	53.0	20.
		0.5	53.6	9.	.31	48.7	13.	.42	47.0	14.	.53	45.1	14.	.60	44.0	14.	.69	42.5	14.	.82	40.2	14.
		1.0	30.7	7.	.30	30.0	6.	.40	29.7	6.	.51	29.4	4.	.60	29.1	3.	.69	28.8	2.	.81	28.5	0.
	0.0	0.1	162.9	4.	.30	148.0	6.	.43	140.2	2.	.50	136.1	-0.	.60	129.5	-3.	.71	122.2	-4.	.81	112.8	-5.
		0.25	118.4	2.	.30	105.5	2.	.40	100.5	2.	.50	95.2	3.	.59	90.3	5.	.71	83.3	7.	.81	77.4	8.
		0.5	77.7	10.	.33	70.7	12.	.41	68.7	12.	.50	66.6	12.	.60	64.0	12.	.71	60.9	12.	.80	58.5	10.
		1.0	43.5	12.	.31	42.2	12.	.40	41.8	11.	.50	41.4	10.	.60	41.0	9.	.69	40.6	8.	.81	40.1	9.
	-0.98	0.1	218.8	0.	.30	203.7	6.	.42	196.9	6.	.50	191.6	6.	.61	184.0	5.	.69	177.5	2.	.78	169.7	-3.
		0.25	171.7	6.	.31	159.9	9.	.41	155.9	8.	.50	151.7	8.	.62	145.9	5.	.72	140.7	2.	.80	135.8	-3.
		0.5	124.6	-4.	.30	124.6	-4.	.40	124.6	-4.	.50	124.6	-4.	.60	122.2	-2.	.68	120.1	-3.	.81	115.5	-9.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 6

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.5			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	381.3	-6.	.30	370.6	-3.	.40	365.0	-1.	.50	357.5	1.	.60	346.7	2.	.70	331.1	2.	.81	301.6	5.
		0.25	253.1	-5.	.30	244.6	-2.	.40	240.6	-0.	.50	235.6	2.	.59	229.8	4.	.70	221.2	5.	.80	210.4	6.
		0.5	141.7	-3.	.30	136.6	0.	.41	134.1	1.	.52	131.1	1.	.61	128.3	1.	.70	124.8	2.	.80	120.0	2.
		1.0	52.7	-2.	.30	52.0	-2.	.41	51.7	-2.	.51	51.4	-3.	.60	51.0	-2.	.71	50.6	-2.	.80	50.3	-3.
	0.0	0.1	408.4	-4.	.30	401.6	-3.	.40	397.0	-2.	.50	390.9	0.	.60	382.3	2.	.69	370.1	5.	.80	347.8	6.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	280.5	-4.	.60	274.1	-2.	.70	265.6	1.	.80	254.0	6.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
	-0.98	0.1	408.4	-4.	.30	408.4	-4.	.40	408.4	-4.	.50	408.4	-4.	.60	408.4	-4.	.70	408.4	-4.	.80	408.4	-4.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	281.2	-5.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
20.	1.0	0.1	294.5	-4.	.31	268.2	-0.	.42	257.2	-0.	.52	244.5	1.	.61	232.4	1.	.69	218.8	1.	.80	199.5	3.
		0.25	189.1	-8.	.31	168.7	-1.	.41	159.6	2.	.51	149.8	5.	.60	140.3	8.	.70	128.2	12.	.80	115.3	15.
		0.5	95.7	2.	.31	86.8	7.	.42	83.4	8.	.53	79.4	10.	.60	76.9	11.	.69	73.7	12.	.81	68.8	14.
		1.0	42.7	2.	.31	41.5	2.	.40	41.1	2.	.51	40.6	1.	.59	40.2	2.	.71	39.6	1.	.80	39.2	1.
	0.0	0.1	336.9	-1.	.30	313.5	5.	.41	302.8	5.	.50	292.0	5.	.61	276.2	4.	.72	258.7	3.	.81	241.3	2.
		0.25	230.8	5.	.30	214.5	8.	.41	207.2	8.	.50	201.0	8.	.61	191.8	7.	.70	182.4	8.	.79	168.3	10.
		0.5	142.8	8.	.32	131.0	12.	.40	127.1	13.	.50	122.8	14.	.60	117.5	15.	.71	111.4	15.	.80	106.0	15.
		1.0	57.6	-0.	.30	57.8	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.4	0.	.80	56.6	1.
	-0.98	0.1	404.7	-4.	.30	388.7	1.	.40	381.4	2.	.50	372.6	5.	.60	361.8	7.	.69	349.2	6.	.80	331.6	4.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	280.3	-4.	.70	269.8	-0.	.80	257.5	4.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
30.	1.0	0.1	187.8	2.	.30	157.5	8.	.40	146.1	9.	.52	131.7	12.	.60	122.3	14.	.69	110.7	18.	.80	96.5	24.
		0.25	101.4	9.	.31	84.6	18.	.42	78.5	21.	.54	72.4	24.	.60	69.0	26.	.71	63.4	29.	.80	58.6	31.
		0.5	53.4	14.	.31	53.0	16.	.41	51.1	17.	.52	49.1	17.	.60	47.6	19.	.71	45.5	19.	.81	43.6	20.
		1.0	33.0	8.	.31	32.1	6.	.42	31.8	5.	.52	31.5	5.	.60	31.2	4.	.71	30.9	2.	.79	30.6	1.
	0.0	0.1	229.3	6.	.30	206.3	10.	.42	195.2	8.	.50	187.5	7.	.60	174.1	8.	.71	158.0	10.	.81	141.7	12.
		0.25	149.8	8.	.31	128.6	11.	.40	121.6	12.	.49	114.2	13.	.60	105.3	16.	.69	97.4	20.	.81	87.7	23.
		0.5	88.0	18.	.30	79.2	20.	.41	75.9	21.	.51	72.9	21.	.59	70.4	21.	.70	67.0	22.	.79	64.2	22.
		1.0	47.1	13.	.30	45.7	12.	.40	45.3	11.	.49	44.9	11.	.60	44.3	11.	.69	43.9	9.	.81	43.3	8.
	-0.98	0.1	318.8	-2.	.30	295.0	6.	.40	285.5	9.	.50	275.1	10.	.60	263.3	11.	.72	248.2	9.	.80	237.9	7.
		0.25	243.3	7.	.31	225.2	12.	.40	218.7	12.	.50	212.0	12.	.60	204.3	11.	.69	195.9	10.	.79	183.7	7.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	157.7	1.	.72	150.4	1.	.80	145.5	0.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 7

L/H	E_1/E_2	e/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	267.3	-5.	.30	261.2	-3.	.40	258.0	-2.	.50	253.9	0.	.61	247.5	-0.	.69	239.8	-0.	.81	223.5	-1.
		0.25	194.3	-4.	.30	189.2	-2.	.40	186.8	-0.	.50	183.8	1.	.58	175.9	4.	.75	171.6	4.	.79	169.1	3.
		0.5	131.1	-4.	.30	127.7	-1.	.40	126.3	-0.	.50	124.5	1.	.60	122.5	3.	.71	119.6	2.	.79	117.4	-0.
		1.0	61.3	-0.	.30	60.5	1.	.40	60.2	0.	.50	59.9	0.	.60	59.5	1.	.71	59.1	-0.	.79	58.7	-0.
	0.0	0.1	283.0	-4.	.30	279.0	-2.	.40	276.4	-1.	.50	272.9	0.	.60	267.9	2.	.72	258.7	1.	.80	248.2	0.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.3	-5.	.60	206.6	-3.	.70	201.7	-0.	.80	194.9	3.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
	-0.98	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	283.0	-4.	.70	283.0	-4.	.80	283.0	-4.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	210.7	-5.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
20.	1.0	0.1	218.3	-2.	.30	203.8	0.	.40	197.6	0.	.50	190.7	1.	.62	180.9	-0.	.71	171.7	-2.	.79	162.2	-2.
		0.25	154.3	-2.	.30	144.6	2.	.40	140.8	2.	.49	136.7	3.	.61	129.2	4.	.71	122.1	5.	.80	113.6	5.
		0.5	99.5	2.	.31	92.8	7.	.41	90.2	8.	.52	87.2	8.	.61	84.4	8.	.70	81.2	8.	.80	78.0	6.
		1.0	50.3	4.	.31	48.9	6.	.40	48.4	5.	.50	47.9	5.	.61	47.4	4.	.70	46.8	4.	.80	46.2	3.
	0.0	0.1	242.3	-1.	.30	229.5	3.	.40	223.5	2.	.50	217.1	2.	.62	207.6	-1.	.72	197.7	-4.	.80	187.5	-5.
		0.25	180.8	4.	.30	170.8	8.	.40	166.6	8.	.49	162.1	8.	.61	155.9	7.	.71	149.9	5.	.80	143.2	3.
		0.5	131.7	2.	.30	124.5	8.	.39	121.9	10.	.50	118.6	11.	.60	115.1	11.	.73	110.1	8.	.81	106.2	5.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.2	-0.	.80	65.4	1.
	-0.98	0.1	280.9	-3.	.30	271.6	1.	.40	267.4	2.	.51	262.1	3.	.60	255.9	3.	.72	247.1	-0.	.81	238.6	-3.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.2	-5.	.70	204.0	-1.	.80	197.3	1.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
30.	1.0	0.1	153.4	7.	.33	137.9	6.	.44	131.0	5.	.56	121.4	7.	.59	119.1	8.	.72	107.6	10.	.80	99.2	11.
		0.25	103.6	8.	.30	91.2	13.	.41	86.5	15.	.52	81.7	17.	.60	77.4	19.	.70	72.8	21.	.79	67.9	21.
		0.5	67.2	14.	.31	61.5	16.	.42	59.5	17.	.53	57.3	18.	.60	55.7	18.	.73	53.1	17.	.79	51.7	17.
		1.0	39.1	10.	.30	38.0	12.	.41	37.7	11.	.51	37.3	9.	.59	37.0	9.	.71	36.5	8.	.81	36.2	6.
	0.0	0.1	179.9	7.	.30	165.0	7.	.43	158.0	5.	.51	152.9	4.	.60	146.9	3.	.72	138.6	0.	.81	131.2	-2.
		0.25	135.6	8.	.30	123.0	9.	.41	117.0	9.	.50	112.3	9.	.60	106.7	10.	.70	100.5	11.	.81	93.3	11.
		0.5	93.7	13.	.29	86.7	15.	.40	84.1	16.	.50	81.4	17.	.60	78.5	16.	.71	75.3	15.	.81	72.5	12.
		1.0	55.2	14.	.30	53.7	14.	.40	53.2	13.	.50	52.7	13.	.60	52.1	12.	.70	51.5	10.	.79	51.0	8.
	-0.98	0.1	232.2	4.	.30	218.8	3.	.40	213.1	3.	.50	207.3	3.	.59	201.0	1.	.71	192.8	-1.	.80	184.6	-6.
		0.25	188.5	6.	.31	177.4	9.	.40	173.4	10.	.50	169.0	9.	.60	164.1	8.	.70	158.9	5.	.80	153.1	-0.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	139.3	-2.	.69	136.8	-1.	.82	132.8	-0.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 8

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	391.1	-6.	.30	381.4	-3.	.40	376.3	-2.	.50	369.5	0.	.60	360.3	2.	.70	346.0	3.	.80	321.6	6.
		0.25	273.9	-4.	.30	265.9	-1.	.40	262.1	0.	.50	257.3	2.	.60	251.3	4.	.68	244.9	7.	.80	232.5	8.
		0.5	163.8	-1.	.30	158.5	2.	.40	156.2	3.	.51	153.1	3.	.60	150.4	4.	.70	145.2	4.	.81	141.1	4.
		1.0	65.6	-2.	.30	64.6	-0.	.41	64.3	-0.	.50	63.9	0.	.60	63.5	0.	.70	63.0	0.	.79	62.5	0.
	0.0	0.1	415.6	-4.	.30	409.3	-2.	.40	405.5	-1.	.50	399.9	0.	.60	392.0	2.	.69	381.6	5.	.80	359.1	6.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	299.5	-4.	.60	293.5	-2.	.70	285.7	1.	.80	274.8	5.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
	-0.98	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.6	-4.	.70	415.6	-4.	.80	415.6	-4.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	300.2	-4.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
20.	1.0	0.1	312.3	-3.	.30	289.2	1.	.40	279.4	2.	.50	267.8	2.	.61	254.3	3.	.70	240.3	3.	.79	223.2	5.
		0.25	211.6	-4.	.30	191.8	4.	.39	183.5	6.	.49	174.2	9.	.61	161.8	12.	.70	149.9	14.	.80	135.9	17.
		0.5	115.8	7.	.31	106.3	9.	.41	102.7	11.	.51	98.8	13.	.60	95.2	13.	.70	90.9	14.	.79	86.4	15.
		1.0	52.8	4.	.30	51.2	7.	.40	50.6	7.	.50	50.1	6.	.59	49.5	7.	.70	48.9	7.	.81	48.1	7.
	0.0	0.1	350.9	-1.	.30	329.8	4.	.40	320.5	4.	.50	309.6	4.	.60	296.9	4.	.72	278.8	3.	.80	264.6	2.
		0.25	252.7	5.	.31	236.4	9.	.40	230.3	9.	.49	223.8	10.	.61	214.7	10.	.72	201.9	11.	.81	187.9	12.
		0.5	164.9	8.	.30	153.4	14.	.40	149.0	15.	.49	144.7	16.	.60	138.8	17.	.71	132.2	17.	.81	125.5	16.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.5	-1.	.80	70.5	1.
	-0.98	0.1	412.2	-3.	.30	397.9	1.	.40	391.2	2.	.50	383.2	4.	.59	374.2	6.	.73	357.6	5.	.79	346.8	4.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	299.3	-4.	.70	289.5	-1.	.80	276.0	3.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
30.	1.0	0.1	210.3	7.	.33	176.7	11.	.45	162.2	13.	.57	147.0	16.	.60	143.8	17.	.70	130.3	21.	.81	115.2	25.
		0.25	121.7	15.	.31	103.8	21.	.41	97.5	24.	.52	90.7	27.	.60	86.1	29.	.71	78.6	32.	.81	72.5	33.
		0.5	72.8	19.	.32	65.8	22.	.42	63.3	23.	.53	60.8	24.	.61	58.9	24.	.70	56.7	25.	.81	53.9	26.
		1.0	40.3	11.	.30	39.1	13.	.40	38.7	13.	.50	38.3	13.	.60	37.9	13.	.71	37.5	12.	.79	37.1	12.
	0.0	0.1	251.3	7.	.33	226.0	9.	.41	218.6	8.	.50	210.7	7.	.60	196.5	8.	.71	179.5	10.	.81	164.1	11.
		0.25	172.1	13.	.30	150.9	15.	.40	143.0	16.	.50	134.6	18.	.59	126.7	20.	.70	116.9	23.	.80	108.1	24.
		0.5	107.5	22.	.32	96.9	23.	.41	93.9	24.	.49	91.0	24.	.59	87.3	25.	.71	83.0	25.	.79	79.3	25.
		1.0	58.4	15.	.30	56.6	16.	.40	56.1	16.	.48	55.5	16.	.59	54.9	16.	.70	54.2	15.	.79	53.6	14.
	-0.98	0.1	334.6	1.	.29	313.7	4.	.42	301.9	5.	.50	294.5	6.	.60	284.3	7.	.70	272.8	7.	.79	260.2	4.
		0.25	264.7	6.	.30	247.3	11.	.40	241.1	12.	.50	234.3	12.	.60	226.8	12.	.70	218.4	10.	.81	209.6	8.
		0.5	185.6	-2.	.30	185.6	-2.	.40	185.6	-2.	.50	185.6	-2.	.60	180.2	1.	.69	174.8	4.	.80	167.8	3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 9

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	298.7	-5.	.30	291.1	-2.	.40	287.1	-1.	.50	282.0	0.	.61	273.7	-0.	.70	263.6	-0.	.79	247.2	0.
		0.25	209.7	-5.	.30	203.8	-2.	.40	201.0	-0.	.50	197.8	1.	.61	192.7	2.	.70	187.5	3.	.79	180.7	2.
		0.5	139.3	-5.	.30	136.6	-3.	.40	135.4	-2.	.50	134.1	-1.	.60	132.4	0.	.70	130.5	2.	.79	125.4	-1.
		1.0	72.7	0.	.30	71.8	1.	.40	71.5	1.	.51	71.1	1.	.60	70.7	0.	.71	70.2	-1.	.80	69.8	-3.
	0.0	0.1	318.4	-3.	.30	313.4	-2.	.40	310.1	-1.	.50	305.7	1.	.60	299.4	3.	.72	287.0	2.	.80	274.4	2.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	228.5	-4.	.60	224.2	-2.	.70	216.4	1.	.80	210.4	4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
	-0.98	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.4	-3.	.70	318.4	-3.	.80	318.4	-3.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.80	229.1	-4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
20.	1.0	0.1	238.1	-2.	.31	220.1	-0.	.42	212.7	-0.	.51	204.5	0.	.60	196.2	1.	.74	179.9	1.	.80	172.0	1.
		0.25	164.1	-3.	.31	153.1	1.	.40	149.0	1.	.50	144.0	3.	.60	138.4	4.	.72	131.5	4.	.80	125.6	3.
		0.5	113.7	-5.	.30	107.0	1.	.41	104.1	2.	.50	101.3	3.	.60	98.2	4.	.72	94.0	2.	.80	94.7	0.
		1.0	60.1	1.	.31	58.4	3.	.40	57.8	3.	.51	57.2	2.	.60	56.6	2.	.69	56.0	1.	.81	55.1	-2.
	0.0	0.1	267.3	1.	.31	250.7	4.	.41	243.8	3.	.50	236.6	3.	.60	226.7	2.	.70	215.4	0.	.80	202.9	-1.
		0.25	194.1	5.	.31	182.2	8.	.41	177.6	8.	.49	172.9	8.	.60	166.5	8.	.72	158.6	7.	.80	152.1	5.
		0.5	139.8	2.	.30	134.1	6.	.39	132.1	7.	.49	129.7	7.	.59	126.8	7.	.71	123.3	6.	.81	119.8	2.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.1	-0.	.80	77.2	-1.
	-0.98	0.1	315.7	-2.	.30	304.1	1.	.40	298.8	3.	.50	292.4	5.	.62	283.5	4.	.72	273.4	1.	.81	262.2	-2.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	228.4	-4.	.70	221.2	-1.	.81	211.9	1.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
30.	1.0	0.1	163.[illegible]	3.	.32	146.5	5.	.44	139.0	3.	.58	130.5	3.	.60	129.2	4.	.71	121.5	4.	.80	114.3	6.
		0.25	117.8	-2.	.31	104.6	3.	.43	99.2	6.	.53	94.2	8.	.60	90.5	10.	.70	85.1	12.	.78	80.4	14.
		0.5	79.3	4.	.32	72.9	8.	.42	70.7	8.	.53	68.1	9.	.60	66.5	9.	.69	64.3	9.	.79	61.0	9.
		1.0	46.9	4.	.30	45.7	6.	.41	45.2	5.	.52	44.7	4.	.59	44.4	3.	.71	43.9	1.	.81	43.4	-1.
	0.0	0.1	193.1	6.	.32	175.1	9.	.42	168.7	7.	.50	163.1	5.	.60	156.3	3.	.71	147.7	2.	.80	139.6	2.
		0.25	143.4	6.	.32	132.0	5.	.41	128.1	4.	.50	124.7	3.	.60	120.2	3.	.70	114.8	4.	.81	107.0	4.
		0.5	107.6	3.	.32	99.7	5.	.40	97.4	6.	.48	95.2	7.	.60	91.7	7.	.71	88.3	7.	.80	85.3	5.
		1.0	65.9	10.	.31	64.1	10.	.40	63.5	9.	.49	62.9	8.	.60	62.2	6.	.69	61.6	5.	.80	60.9	2.
	-0.98	0.1	254.8	3.	.31	238.2	8.	.42	230.3	8.	.49	225.3	7.	.57	219.3	7.	.66	209.9	5.	.80	198.5	-0.
		0.25	202.9	6.	.31	190.1	10.	.41	185.3	10.	.50	180.9	10.	.51	174.8	8.	.72	168.2	6.	.79	163.8	4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.50	147.5	-2.	.69	144.8	-1.	.79	141.4	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.50	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 1C

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	420.1	-6.	.30	408.6	-3.	.40	402.6	-1.	.50	394.9	1.	.60	383.5	2.	.70	367.0	3.	.81	335.9	6.
		0.25	285.8	-4.	.30	276.9	-1.	.40	272.8	0.	.50	267.8	2.	.60	261.3	4.	.71	252.1	6.	.81	240.1	3.
		0.5	183.0	-4.	.30	177.7	-1.	.40	175.4	0.	.50	172.6	2.	.61	168.9	2.	.71	165.0	2.	.80	160.4	2.
		1.0	78.3	-1.	.30	77.2	0.	.40	76.8	0.	.51	75.3	0.	.60	75.9	0.	.70	75.3	0.	.79	74.8	0.
	0.0	0.1	449.5	-4.	.30	442.0	-2.	.40	437.1	-1.	.50	430.5	0.	.60	421.2	3.	.69	408.3	5.	.81	380.3	6.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.1	-4.	.60	307.5	-1.	.70	298.8	1.	.80	286.7	5.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
	-0.98	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.5	-4.	.70	449.5	-4.	.80	449.5	-4.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	314.9	-4.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
20.	1.0	0.1	328.6	-3.	.31	301.3	0.	.42	290.1	0.	.52	277.4	1.	.60	265.1	2.	.71	247.2	3.	.80	229.7	5.
		0.25	218.5	-5.	.30	202.9	-0.	.40	196.5	1.	.50	190.0	2.	.60	181.4	4.	.71	167.8	7.	.80	156.0	9.
		0.5	133.8	1.	.32	123.4	4.	.42	119.5	5.	.53	115.0	7.	.60	112.1	7.	.71	106.8	8.	.79	102.2	9.
		1.0	63.7	2.	.30	62.0	4.	.40	61.3	3.	.51	60.6	3.	.60	60.0	3.	.70	59.2	2.	.80	58.5	2.
	0.0	0.1	372.8	0.	.30	348.6	4.	.41	337.2	4.	.50	326.5	5.	.61	310.5	4.	.71	292.9	4.	.81	273.5	3.
		0.25	262.5	5.	.31	245.1	8.	.40	238.3	8.	.49	231.4	9.	.60	222.4	9.	.70	212.0	9.	.80	201.8	9.
		0.5	184.0	2.	.30	172.7	8.	.39	168.5	10.	.50	163.2	11.	.60	157.6	11.	.70	151.5	11.	.80	144.9	10.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.0	1.	.81	83.8	2.
	-0.98	0.1	445.4	-3.	.35	428.1	1.	.40	420.2	3.	.50	410.8	5.	.59	399.9	7.	.70	385.4	6.	.79	368.4	5.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	313.9	-4.	.70	303.0	0.	.80	290.3	4.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
30.	1.0	0.1	217.2	1.	.31	194.2	3.	.42	185.1	2.	.54	170.2	4.	.60	163.2	6.	.70	149.1	10.	.80	133.6	15.
		0.25	140.1	3.	.31	121.0	10.	.42	113.7	13.	.54	105.8	16.	.60	101.4	18.	.69	94.8	21.	.81	88.4	24.
		0.5	86.5	9.	.31	78.7	14.	.42	75.9	15.	.52	73.0	15.	.60	71.0	15.	.70	68.4	16.	.78	65.7	17.
		1.0	49.5	7.	.30	48.2	6.	.41	47.7	6.	.51	47.3	5.	.60	46.8	4.	.69	46.4	4.	.81	45.9	2.
	0.0	0.1	261.1	5.	.30	236.3	10.	.43	224.7	8.	.50	216.9	7.	.60	206.8	5.	.70	196.1	4.	.80	184.5	4.
		0.25	189.0	3.	.31	169.0	5.	.42	160.2	5.	.50	153.1	6.	.59	145.0	8.	.70	135.4	11.	.80	125.4	14.
		0.5	125.1	10.	.31	114.4	13.	.41	110.5	13.	.49	107.4	14.	.60	103.0	14.	.70	98.8	15.	.80	94.3	14.
		1.0	70.1	12.	.30	68.1	13.	.40	67.5	12.	.49	66.8	11.	.59	66.1	10.	.69	65.4	9.	.80	64.6	8.
	-0.98	0.1	354.0	1.	.30	329.1	8.	.41	318.3	8.	.50	309.0	9.	.60	297.3	10.	.70	283.7	9.	.80	269.3	6.
		0.25	275.6	7.	.31	256.5	11.	.40	249.9	11.	.50	242.9	11.	.60	234.6	11.	.70	226.2	10.	.81	216.5	7.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	194.8	-1.	.69	191.0	1.	.80	185.3	-2.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 11

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	311.4	-4.	.30	304.7	-2.	.40	301.1	-1.	.49	296.9	1.	.62	288.6	1.	.70	280.0	1.	.79	267.0	2.
		0.25	230.7	-3.	.30	225.1	-1.	.40	222.4	0.	.50	219.1	2.	.60	215.0	4.	.70	209.0	5.	.80	201.7	3.
		0.5	160.5	-4.	.30	157.7	-2.	.40	156.5	-1.	.50	155.0	0.	.60	153.3	1.	.70	151.2	2.	.61	148.5	1.
		1.0	89.9	1.	.30	88.9	2.	.40	88.5	2.	.51	88.0	2.	.61	87.6	2.	.71	87.0	1.	.80	86.5	-1.
	0.0	0.1	328.9	-3.	.30	324.5	-1.	.40	321.5	-0.	.50	317.6	1.	.60	312.1	2.	.71	302.4	2.	.79	291.3	2.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.4	-4.	.60	244.3	-2.	.70	238.9	0.	.80	231.4	3.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
	-0.98	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.9	-3.	.70	328.9	-3.	.80	328.9	-3.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
20.	1.0	0.1	257.3	-1.	.30	241.2	2.	.40	234.8	3.	.49	227.3	3.	.61	217.0	4.	.72	204.2	4.	.81	192.7	3.
		0.25	186.0	0.	.30	175.1	4.	.39	170.8	5.	.49	165.9	6.	.60	159.5	7.	.72	152.1	7.	.79	146.8	6.
		0.5	134.3	-3.	.30	127.7	3.	.40	125.0	5.	.49	122.0	6.	.61	118.0	7.	.72	113.8	5.	.81	109.5	3.
		1.0	75.4	4.	.30	73.6	5.	.41	72.9	5.	.51	72.2	5.	.60	71.5	5.	.70	70.7	2.	.80	69.9	0.
	0.0	0.1	283.5	2.	.30	269.2	4.	.41	262.6	4.	.50	256.0	4.	.60	246.8	4.	.72	234.3	2.	.81	222.3	-1.
		0.25	215.8	5.	.30	204.6	9.	.40	199.9	10.	.49	195.0	10.	.60	188.6	10.	.71	181.1	9.	.80	174.0	7.
		0.5	161.1	2.	.30	155.0	6.	.40	152.6	8.	.49	150.3	9.	.59	147.4	10.	.72	143.1	8.	.81	140.1	6.
		1.0	95.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.1	-0.	.80	95.0	1.
	-0.98	0.1	326.5	-2.	.30	316.2	1.	.40	311.5	3.	.51	305.5	3.	.60	298.8	3.	.70	290.8	2.	.79	280.8	-1.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.3	-4.	.70	241.6	-1.	.80	233.6	2.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
30.	1.0	0.1	185.1	10.	.33	167.5	10.	.44	160.8	10.	.54	153.6	10.	.60	149.8	10.	.69	143.1	11.	.79	135.2	11.
		0.25	137.7	6.	.31	125.7	8.	.41	120.4	10.	.50	115.4	12.	.60	109.8	14.	.70	103.8	16.	.79	97.9	16.
		0.5	97.4	7.	.30	90.4	11.	.40	88.0	12.	.50	85.4	13.	.60	82.6	14.	.72	79.4	14.	.80	76.9	12.
		1.0	59.9	9.	.30	58.4	9.	.40	57.9	8.	.51	57.3	8.	.60	56.8	7.	.69	56.3	6.	.78	55.8	4.
	0.0	0.1	214.8	10.	.31	198.0	11.	.42	191.0	10.	.50	185.0	9.	.60	177.7	8.	.69	170.5	8.	.81	160.5	6.
		0.25	164.8	11.	.30	153.5	11.	.42	148.7	10.	.49	145.2	10.	.60	140.3	10.	.69	135.6	10.	.80	128.6	9.
		0.5	128.5	7.	.30	120.4	9.	.40	117.6	10.	.50	114.4	11.	.59	111.5	12.	.72	107.1	11.	.79	104.2	9.
		1.0	82.0	11.	.30	80.0	13.	.40	79.3	12.	.49	78.7	12.	.60	77.9	10.	.70	77.1	9.	.80	76.4	5.
	-0.98	0.1	272.5	7.	.30	257.7	6.	.40	251.6	5.	.50	245.1	5.	.59	238.4	4.	.71	229.1	2.	.81	219.5	-2.
		0.25	224.3	6.	.30	212.0	11.	.40	207.5	11.	.49	202.9	11.	.60	197.4	10.	.71	190.5	8.	.81	184.4	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	169.0	-2.	.69	166.2	-1.	.80	162.4	-0.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 12

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	434.0	-5.	.30	423.8	-3.	.40	418.4	-1.	.50	411.2	0.	.60	401.7	2.	.70	386.6	3.	.80	361.7	6.
		0.25	311.9	-4.	.30	303.5	-1.	.40	299.5	0.	.50	294.6	2.	.60	288.3	4.	.69	280.6	7.	.81	267.9	9.
		0.5	209.9	-3.	.30	205.7	-1.	.40	203.3	0.	.50	200.4	2.	.60	197.1	3.	.71	192.5	4.	.80	187.7	3.
		1.0	98.0	0.	.30	96.8	1.	.40	96.3	1.	.50	95.8	1.	.60	95.2	1.	.70	94.5	1.	.79	93.9	1.
	0.0	0.1	460.0	-4.	.30	453.3	-2.	.40	448.9	-1.	.50	443.0	0.	.60	435.0	2.	.69	423.8	4.	.81	399.9	6.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	338.4	-3.	.60	332.3	-2.	.70	324.1	1.	.80	312.9	4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
	-0.98	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	460.0	-4.	.70	460.0	-4.	.80	460.0	-4.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	339.1	-4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
20.	1.0	0.1	351.8	-2.	.31	326.8	2.	.40	317.9	2.	.50	306.2	3.	.60	291.9	4.	.71	275.0	5.	.81	256.2	6.
		0.25	246.2	-1.	.30	230.6	4.	.39	224.6	4.	.49	217.7	6.	.60	209.5	7.	.70	196.9	10.	.82	180.2	13.
		0.5	159.7	3.	.31	148.7	8.	.41	144.5	9.	.53	139.3	10.	.60	135.7	11.	.70	130.3	11.	.81	123.7	11.
		1.0	80.4	5.	.31	78.2	6.	.41	77.4	6.	.51	76.6	5.	.60	75.8	6.	.70	74.8	5.	.80	73.9	5.
	0.0	0.1	391.8	0.	.31	369.6	4.	.40	360.5	4.	.49	350.4	5.	.61	335.3	4.	.71	318.6	4.	.80	301.1	3.
		0.25	289.7	6.	.30	272.8	10.	.40	266.4	10.	.49	259.7	10.	.60	250.1	11.	.71	239.4	11.	.80	223.2	11.
		0.5	210.7	3.	.30	200.4	8.	.40	195.7	10.	.49	191.1	12.	.51	184.5	13.	.71	178.0	13.	.80	171.8	12.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	105.9	0.	.80	104.5	1.
	-0.98	0.1	456.4	-3.	.30	441.1	0.	.40	434.1	2.	.50	425.6	4.	.59	416.0	5.	.71	401.1	5.	.80	386.9	4.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	338.2	-3.	.70	328.1	-0.	.80	316.2	3.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
30.	1.0	0.1	244.8	8.	.33	219.5	8.	.44	209.5	8.	.56	195.8	10.	.60	189.8	11.	.68	178.2	14.	.79	160.8	17.
		0.25	166.3	8.	.31	146.1	14.	.40	139.1	16.	.51	131.4	19.	.60	124.1	21.	.71	115.3	24.	.81	106.8	26.
		0.5	107.6	14.	.31	98.4	17.	.41	95.3	18.	.51	92.1	18.	.59	89.4	19.	.71	85.4	20.	.81	81.8	20.
		1.0	62.5	11.	.31	60.8	11.	.41	60.2	11.	.52	59.6	10.	.60	59.1	10.	.70	58.5	9.	.80	57.8	8.
	0.0	0.1	288.2	8.	.33	261.8	9.	.41	253.6	9.	.50	245.3	8.	.60	234.2	8.	.71	222.4	8.	.80	211.3	7.
		0.25	216.0	10.	.30	197.4	10.	.41	188.4	10.	.49	181.5	11.	.60	171.2	13.	.70	161.1	15.	.80	151.0	17.
		0.5	150.2	14.	.32	138.1	16.	.41	134.2	17.	.50	130.2	18.	.60	125.9	18.	.70	121.2	19.	.80	116.2	18.
		1.0	88.2	14.	.31	85.8	15.	.39	85.1	14.	.48	84.4	14.	.59	83.4	13.	.70	82.5	12.	.79	81.6	11.
	-0.98	0.1	374.8	4.	.29	352.8	5.	.40	343.0	5.	.50	333.6	5.	.59	323.2	6.	.72	307.2	5.	.80	297.1	4.
		0.25	302.3	7.	.30	284.2	11.	.40	277.4	11.	.49	271.0	12.	.60	262.2	12.	.71	253.3	10.	.80	245.1	9.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	222.0	-1.	.69	217.9	1.	.80	212.6	2.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 13

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	231.4	-6.	.30	225.1	-3.	.40	221.7	-1.	.51	216.7	-0.	.61	209.8	-1.	.70	201.7	-2.	.78	188.8	-2.
		0.25	152.2	-6.	.30	146.8	-3.	.40	144.2	-1.	.51	140.5	-0.	.63	135.5	0.	.73	129.6	2.	.78	126.2	1.
		0.5	82.5	-2.	.30	79.3	1.	.40	77.9	2.	.53	75.8	1.	.66	73.3	1.	.72	71.6	1.	.80	69.5	-1.
		1.0	31.1	-1.	.31	30.6	-1.	.41	30.5	-2.	.52	30.3	-2.	.63	30.0	-3.	.75	29.8	-4.	.80	29.6	-3.
	0.0	0.1	247.9	-5.	.30	243.5	-3.	.40	240.8	-2.	.50	237.2	-0.	.60	232.1	2.	.69	225.3	2.	.81	209.3	-0.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	169.6	-4.	.60	165.5	-2.	.70	165.2	2.	.80	152.8	1.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.82	97.4	-8.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
	-0.98	0.1	247.9	-5.	.30	247.9	-5.	.40	247.9	-5.	.50	247.9	-5.	.60	247.9	-5.	.70	247.9	-5.	.80	247.9	-5.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	171.2	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97[illegible]	-1.	.60	97.4	-1.	.70	97.4	-1.	.80	97.4	-1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	[illegible]	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
20.	1.0	0.1	175.2	-6.	.32	158.3	-0.	.45	148.8	-2.	.4[illegible]	[illegible]8.8	-2.	.64	132.2	-2.	.64	132.2	-2.	.79	115.5	-1.
		0.25	107.2	-13.	.31	95.1	-5.	.44	88.3	-1.	.5[illegible]	83.0	1.	.59	79.1	4.	.68	72.6	7.	.79	64.3	12.
		0.5	52.8	0.	.32	48.0	4.	.43	46.1	5.	.5[illegible]	43.7	7.	.56	43.7	7.	.73	40.4	8.	.79	39.0	9.
		1.0	24.2	4.	.31	23.5	2.	.42	23.3	2.	.55	22.9	0.	.55	22.9	0.	.68	22.6	-0.	.80	22.3	-1.
	0.0	0.1	201.9	-1.	.30	187.3	5.	.41	180.4	4.	.51	173.0	3.	.60	165.3	2.	.69	155.1	-1.	.79	143.8	-2.
		0.25	134.7	4.	.32	123.3	7.	.42	118.7	6.	.49	115.2	6.	.61	108.7	5.	.71	102.9	4.	.79	95.2	6.
		0.5	79.5	9.	.31	72.6	13.	.41	70.1	13.	.50	67.6	14.	.60	64.6	14.	.70	61.4	14.	.80	58.0	13.
		1.0	34.4	-0.	.33	33.9	1.	.40	33.6	2.	.50	33.2	3.	.60	32.8	4.	.72	32.3	4.	.80	31.9	3.
	-0.98	0.1	243.4	-3.	.30	233.7	1.	.40	229.3	3.	.50	223.8	6.	.60	217.0	6.	.69	210.0	4.	.81	197.5	-0.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	166.2	-2.	.70	159.5	2.	.80	151.7	1.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.80	97.4	-1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
30.	1.0	0.1	100.9	6.	.37	77.3	10.	.37	77.3	10.	.49	69.5	11.	.61	61.5	13.	.75	51.9	19.	.80	45.4	21.
		0.25	51.3	7.	.33	42.8	14.	.46	39.3	17.	.46	39.3	17.	.61	35.5	21.	.68	33.7	23.	.80	30.7	26.
		0.5	30.5	13.	.33	27.6	14.	.45	26.5	15.	.45	26.5	15.	.59	25.1	15.	.75	23.6	16.	.80	23.1	16.
		1.0	17.6	11.	.32	17.1	8.	.44	16.9	6.	.44	16.9	6.	.57	16.7	5.	.69	16.5	3.	.82	16.3	1.
	0.0	0.1	128.1	6.	.32	111.6	12.	.42	105.9	10.	.51	100.3	9.	.61	91.0	10.	.72	81.3	12.	.79	74.3	14.
		0.25	77.4	12.	.28	66.3	10.	.38	62.4	11.	.51	57.1	12.	.59	53.7	14.	.70	49.1	17.	.80	45.0	19.
		0.5	44.9	16.	.30	40.8	17.	.43	38.9	17.	.50	37.8	18.	.50	36.3	18.	.69	34.9	18.	.79	33.4	18.
		1.0	[illegible]4.8	19.	.32	24.1	15.	.40	23.9	15.	.50	23.6	13.	.59	23.4	13.	.71	23.1	10.	.80	22.9	8.
	-0.98	0.1	185.2	-6.	.30	169.8	3.	.40	163.7	6.	.50	157.1	10.	.60	149.8	14.	.73	139.6	12.	.81	132.1	9.
		0.25	137.0	10.	.30	125.6	17.	.41	120.8	17.	.50	116.5	16.	.61	111.2	15.	.72	105.5	12.	.80	100.8	10.
		0.5	97.4	-1.	.30	91.9	5.	.40	88.6	7.	.50	85.5	8.	.59	82.3	8.	.68	79.3	7.	.81	74.6	4.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 14

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	356.1	-6.	.30	345.8	-3.	.40	340.4	-1.	.50	333.0	1.	.62	320.6	2.	.78	288.5	5.	.80	278.9	6.
		0.25	224.3	-6.	.30	215.1	-2.	.40	210.8	0.	.50	205.1	2.	.62	197.1	4.	.77	181.9	6.	.81	175.7	6.
		0.5	102.1	-5.	.30	97.3	-0.	.41	95.1	-0.	.53	92.3	1.	.65	88.7	1.	.77	84.1	3.	.80	83.2	3.
		1.0	34.4	-3.	.31	33.9	-4.	.41	33.7	-4.	.52	33.5	-5.	.63	33.2	-5.	.73	33.0	-6.	.83	32.7	-6.
	0.0	0.1	382.8	-5.	.30	375.5	-3.	.40	371.2	-2.	.50	365.4	-0.	.60	357.1	2.	.69	346.0	5.	.80	323.3	7.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	253.7	-4.	.60	246.9	-1.	.70	237.8	3.	.80	225.3	8.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
	-0.98	0.1	382.8	-5.	.30	382.8	-5.	.40	382.8	-5.	.50	382.8	-5.	.60	382.8	-5.	.70	382.8	-5.	.80	382.8	-5.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	256.4	-5.	.70	256.4	-5.	.80	256.4	-5.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
20.	1.0	0.1	263.2	-4.	.31	235.9	5.	.44	220.6	6.	.44	220.6	6.	.59	198.6	7.	.72	176.2	9.	.84	147.0	16.
		0.25	144.5	-10.	.32	121.3	1.	.44	110.9	7.	.58	97.1	14.	.58	97.1	14.	.67	88.8	10.	.82	73.0	26.
		0.5	60.8	3.	.32	54.7	6.	.44	52.2	8.	.58	49.1	10.	.54	47.7	11.	.73	45.3	13.	.80	43.5	14.
		1.0	26.6	3.	.32	25.8	1.	.43	25.5	1.	.54	25.2	0.	.57	24.8	-0.	.72	24.6	-0.	.79	24.4	-2.
	0.0	0.1	307.8	-1.	.30	283.6	7.	.40	273.6	9.	.51	259.1	9.	.62	242.1	9.	.72	223.4	8.	.81	205.2	9.
		0.25	194.5	7.	.30	176.8	13.	.41	168.9	13.	.50	161.8	13.	.60	149.3	16.	.71	134.5	18.	.79	121.4	22.
		0.5	97.6	14.	.31	87.5	19.	.40	84.2	20.	.50	80.4	21.	.60	76.5	22.	.70	72.0	23.	.80	67.9	23.
		1.0	38.3	-1.	.30	37.8	0.	.40	37.3	1.	.50	36.9	2.	.60	36.4	2.	.72	35.8	3.	.79	35.4	3.
	-0.98	0.1	375.4	-3.	.30	359.8	1.	.40	352.6	3.	.50	343.9	6.	.59	334.3	8.	.73	315.5	9.	.79	303.8	8.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	248.0	-1.	.70	236.6	3.	.80	225.3	9.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
30.	1.0	0.1	130.8	21.	.35	96.6	32.	.35	96.6	32.	.52	79.8	37.	.62	71.4	39.	.73	61.5	43.	.81	54.8	45.
		0.25	59.0	18.	.35	47.8	23.	.35	47.8	23.	.49	43.3	27.	.64	38.8	31.	.72	36.4	33.	.80	33.9	35.
		0.5	33.8	18.	.34	30.4	18.	.46	29.0	19.	.46	29.0	19.	.59	27.6	20.	.74	26.0	21.	.81	25.2	21.
		1.0	19.2	12.	.32	18.6	8.	.44	18.4	7.	.44	18.4	7.	.57	18.2	5.	.69	18.0	4.	.80	17.3	4.
	0.0	0.1	183.4	13.	.31	156.7	24.	.42	141.7	26.	.51	129.9	28.	.61	115.1	31.	.72	100.4	35.	.81	87.9	39.
		0.25	94.4	29.	.30	77.7	31.	.40	72.2	32.	.51	66.6	33.	.61	61.0	34.	.70	56.5	35.	.80	51.4	37.
		0.5	51.0	25.	.32	45.6	24.	.41	43.9	25.	.50	42.3	26.	.60	40.6	26.	.70	38.8	27.	.80	36.9	27.
		1.0	27.2	21.	.31	26.4	17.	.40	26.2	16.	.50	25.9	15.	.59	25.7	14.	.69	25.4	13.	.81	25.1	12.
	-0.98	0.1	280.0	-3.	.30	254.1	6.	.40	243.9	10.	.50	232.6	14.	.59	221.5	18.	.73	202.7	21.	.81	190.5	20.
		0.25	199.6	14.	.30	179.4	22.	.40	172.6	24.	.51	164.5	24.	.60	155.2	25.	.71	141.8	26.	.80	131.0	27.
		0.5	125.2	-1.	.30	116.4	7.	.40	111.5	10.	.51	106.1	14.	.60	101.4	15.	.69	96.8	15.	.80	90.3	16.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 15

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	237.9	-5.	.30	232.1	-3.	.40	229.1	-1.	.50	224.9	0.	.63	217.1	-0.	.73	206.9	-2.	.82	192.7	-1.
		0.25	164.9	-5.	.30	159.7	-2.	.40	157.3	-0.	.50	154.1	2.	.61	150.1	3.	.69	146.0	3.	.81	137.9	-1.
		0.5	98.4	-2.	.30	95.2	1.	.40	93.8	2.	.52	91.8	2.	.64	89.2	1.	.79	85.3	-2.	.83	83.9	-3.
		1.0	38.6	-2.	.30	38.1	-1.	.40	37.8	-0.	.50	37.6	0.	.60	37.3	1.	.71	37.0	1.	.80	36.7	1.
	0.0	0.1	253.3	-5.	.30	249.0	-3.	.40	246.5	-2.	.50	243.2	-0.	.60	238.5	1.	.72	229.5	1.	.79	220.0	-0.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	181.2	-4.	.60	177.4	-2.	.70	172.4	1.	.79	165.9	2.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-7.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
	-0.98	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.60	253.3	-5.	.70	253.3	-5.	.80	253.3	-5.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	182.6	-5.	.80	182.6	-5.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-3.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
20.	1.0	0.1	186.3	-2.	.32	170.6	1.	.45	162.0	1.	.53	155.8	1.	.62	147.8	0.	.75	134.3	-0.	.81	127.4	0.
		0.25	122.2	-4.	.32	110.6	-0.	.44	103.9	2.	.57	95.9	6.	.57	95.9	6.	.77	81.0	11.	.80	73.6	12.
		0.5	66.2	3.	.31	60.6	7.	.43	58.1	9.	.57	55.1	10.	.57	55.1	10.	.71	51.5	11.	.79	49.3	12.
		1.0	29.6	5.	.31	28.7	7.	.41	28.4	8.	.52	28.0	8.	.63	27.7	8.	.69	27.4	8.	.81	27.0	7.
	0.0	0.1	210.8	0.	.30	197.5	5.	.41	191.1	4.	.50	185.1	4.	.63	174.3	2.	.72	164.4	-1.	.80	155.0	-2.
		0.25	148.1	7.	.30	138.0	9.	.41	133.6	8.	.50	129.7	8.	.60	124.2	7.	.71	118.3	6.	.80	110.4	6.
		0.5	95.3	9.	.30	88.4	14.	.41	85.6	14.	.49	83.1	15.	.61	79.4	15.	.70	76.2	14.	.81	72.0	12.
		1.0	43.1	-0.	.30	42.5	1.	.40	42.0	2.	.50	41.4	4.	.60	40.9	5.	.69	40.4	6.	.80	39.7	7.
	-0.98	0.1	249.0	-3.	.30	240.0	1.	.40	236.0	2.	.50	231.1	5.	.60	224.9	6.	.69	218.2	3.	.81	206.2	-2.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	178.0	-2.	.70	171.7	1.	.81	163.4	1.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.81	112.9	-7.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
30.	1.0	0.1	116.2	5.	.33	95.8	14.	.33	95.8	14.	.49	85.1	16.	.58	78.2	18.	.69	69.5	21.	.80	61.7	26.
		0.25	64.5	12.	.32	54.3	20.	.45	49.9	23.	.45	49.9	23.	.60	45.0	27.	.60	45.0	27.	.83	37.0	33.
		0.5	37.9	18.	.32	34.1	22.	.44	32.7	23.	.56	31.2	24.	.56	31.2	24.	.70	29.5	25.	.81	28.0	25.
		1.0	21.1	16.	.31	20.5	15.	.42	20.3	15.	.53	20.0	15.	.65	19.8	14.	.77	19.6	14.	.81	19.5	13.
	0.0	0.1	141.9	5.	.29	128.1	13.	.42	121.4	11.	.50	116.1	10.	.61	106.8	10.	.70	99.2	11.	.81	87.7	14.
		0.25	93.2	12.	.27	82.2	17.	.41	76.0	18.	.50	71.5	18.	.58	67.6	20.	.69	62.6	21.	.78	58.1	24.
		0.5	56.7	20.	.30	51.4	23.	.41	49.3	24.	.50	47.6	24.	.60	45.6	24.	.69	43.8	24.	.81	41.4	24.
		1.0	30.3	21.	.28	29.5	22.	.40	29.2	22.	.49	28.9	21.	.60	28.5	20.	.69	28.2	19.	.79	27.9	13.
	-0.98	0.1	195.5	-5.	.30	181.4	3.	.40	175.7	6.	.49	170.0	9.	.59	163.0	12.	.69	155.8	9.	.81	146.3	6.
		0.25	150.4	11.	.30	139.5	16.	.40	135.4	16.	.50	131.3	16.	.60	126.6	15.	.71	121.1	13.	.80	116.3	9.
		0.5	112.9	-3.	.30	107.6	2.	.40	104.6	4.	.50	101.3	7.	.61	97.6	9.	.69	94.6	8.	.80	90.6	5.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 16

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	363.0	-6.	.30	353.3	-3.	.40	348.1	-1.	.50	341.2	1.	.60	331.1	3.	.75	306.5	4.	.61	290.2	7.
		0.25	240.2	-4.	.30	231.5	-1.	.40	227.4	1.	.50	222.4	3.	.60	215.8	6.	.77	200.5	7.	.80	196.3	7.
		0.5	121.9	-3.	.30	116.8	1.	.41	114.4	1.	.53	111.3	2.	.65	107.5	2.	.65	107.5	2.	.79	101.9	4.
		1.0	40.4	-2.	.30	39.8	-1.	.40	39.6	-0.	.50	39.3	1.	.61	39.0	1.	.78	38.4	2.	.79	38.4	2.
	0.0	0.1	388.0	-5.	.30	381.2	-3.	.40	377.2	-2.	.50	371.7	-0.	.60	363.9	2.	.69	353.6	4.	.80	332.1	7.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	267.7	-4.	.60	261.3	-1.	.70	252.8	2.	.80	241.2	7.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
	-0.98	0.1	388.0	-5.	.30	388.0	-5.	.40	388.0	-5.	.50	388.0	-5.	.60	388.0	-5.	.70	388.0	-5.	.80	388.0	-5.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	270.1	-5.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
20.	1.0	0.1	276.4	-2.	.31	250.5	5.	.43	237.0	6.	.43	237.0	6.	.58	217.7	7.	.67	204.8	7.	.78	184.2	9.
		0.25	164.2	-3.	.32	141.5	6.	.44	130.7	10.	.44	130.7	10.	.58	117.4	16.	.76	96.3	24.	.82	89.4	26.
		0.5	74.3	5.	.31	66.7	12.	.43	63.6	14.	.55	60.0	17.	.55	60.0	17.	.68	55.9	19.	.81	51.7	22.
		1.0	30.6	7.	.31	29.7	9.	.41	29.3	8.	.52	29.0	9.	.63	28.6	9.	.74	28.1	9.	.78	28.0	10.
	0.0	0.1	317.8	-0.	.30	295.5	7.	.40	285.9	8.	.50	274.0	9.	.62	257.2	8.	.70	244.5	7.	.81	222.5	7.
		0.25	212.2	9.	.31	195.0	13.	.40	188.8	13.	.50	180.8	14.	.61	168.7	15.	.71	154.9	18.	.80	141.3	20.
		0.5	117.1	14.	.31	106.1	20.	.40	102.4	20.	.50	99.3	21.	.60	93.7	23.	.71	83.0	23.	.81	82.6	24.
		1.0	45.3	-0.	.30	44.7	1.	.40	44.1	3.	.50	43.5	4.	.60	42.9	5.	.70	42.3	7.	.80	41.5	8.
	-0.98	0.1	391.2	-3.	.30	366.4	1.	.40	359.7	3.	.50	351.5	5.	.59	342.6	7.	.72	326.0	8.	.80	312.8	7.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	262.3	-2.	.70	251.7	2.	.80	239.3	7.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
30.	1.0	0.1	151.0	16.	.33	118.4	28.	.47	102.7	32.	.47	102.7	32.	.67	81.9	39.	.74	74.3	42.	.82	65.6	46.
		0.25	71.9	21.	.33	58.3	31.	.45	53.3	34.	.45	53.3	34.	.65	45.3	41.	.75	41.7	43.	.81	39.3	45.
		0.5	39.6	24.	.32	35.5	27.	.45	33.9	28.	.45	33.9	29.	.57	32.3	33.	.70	30.5	31.	.79	24.2	33.
		1.0	21.7	18.	.31	21.0	18.	.42	20.8	18.	.54	20.6	17.	.65	20.3	17.	.77	20.1	16.	.79	20.0	17.
	0.0	0.1	201.9	10.	.30	176.5	21.	.41	162.6	23.	.51	150.3	24.	.61	136.2	27.	.71	120.9	33.	.81	105.4	34.
		0.25	113.7	25.	.30	95.2	31.	.41	87.6	33.	.50	81.9	34.	.60	74.9	37.	.71	69.1	39.	.81	61.2	42.
		0.5	61.6	30.	.30	55.0	32.	.40	52.8	33.	.50	50.6	34.	.59	48.4	35.	.71	45.8	36.	.80	43.5	36.
		1.0	31.4	24.	.31	30.5	24.	.40	30.2	24.	.49	29.9	24.	.59	29.5	24.	.69	29.2	24.	.80	26.8	23.
	-0.98	0.1	292.0	-3.	.30	268.0	5.	.40	258.4	9.	.50	247.9	12.	.60	236.4	16.	.68	226.0	18.	.81	208.7	16.
		0.25	215.9	14.	.30	198.1	21.	.40	191.6	22.	.50	184.6	22.	.60	174.3	23.	.70	163.3	24.	.81	149.5	24.
		0.5	145.6	-2.	.30	136.7	4.	.40	131.8	8.	.50	126.5	11.	.60	121.0	15.	.73	113.9	15.	.81	109.3	15.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 17

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	293.6	-4.	.30	286.1	-1.	.40	282.2	-0.	.50	276.9	0.	.60	269.8	0.	.70	258.2	0.	.79	242.0	0.
		0.25	203.2	-4.	.30	197.0	-1.	.40	194.1	0.	.50	190.6	1.	.59	186.2	2.	.70	179.9	3.	.78	173.6	1.
		0.5	130.1	-4.	.30	127.3	-2.	.40	126.0	-1.	.50	124.6	0.	.60	122.9	2.	.70	120.9	3.	.80	113.3	1.
		1.0	66.1	1.	.30	65.3	2.	.40	64.9	2.	.49	64.6	3.	.59	64.3	3.	.71	63.8	2.	.79	63.4	-1.
	0.0	0.1	313.2	-3.	.30	307.8	-1.	.40	304.6	0.	.50	300.3	2.	.60	294.4	3.	.72	283.1	3.	.81	268.2	2.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	222.7	-4.	.60	218.2	-1.	.70	212.1	1.	.81	202.3	1.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
	-0.98	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	313.2	-3.	.70	313.2	-3.	.80	313.2	-3.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.80	224.4	-4.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
20.	1.0	0.1	229.0	-4.	.30	211.2	1.	.40	203.9	0.	.49	195.8	-0.	.59	186.7	-0.	.69	174.7	1.	.79	161.6	1.
		0.25	152.7	-5.	.30	141.8	-1.	.39	137.3	-0.	.50	132.1	1.	.60	126.3	2.	.70	120.1	4.	.81	112.3	5.
		0.5	101.7	-5.	.30	96.5	1.	.39	94.0	1.	.48	91.3	2.	.59	88.0	2.	.69	84.5	3.	.78	81.0	2.
		1.0	52.6	2.	.29	51.3	4.	.39	50.8	4.	.49	50.3	3.	.59	49.7	3.	.71	49.0	2.	.80	48.5	0.
	0.0	0.1	259.2	0.	.30	242.5	6.	.40	235.2	5.	.51	226.6	4.	.61	216.8	3.	.72	202.7	2.	.80	192.1	0.
		0.25	183.3	5.	.31	170.8	8.	.41	166.2	7.	.50	161.4	7.	.60	155.3	7.	.71	147.8	6.	.81	139.5	6.
		0.5	127.4	3.	.30	121.5	7.	.40	119.2	8.	.49	116.8	8.	.60	113.8	8.	.70	110.7	8.	.80	107.4	5.
		1.0	72.4	1.	.30	71.5	3.	.40	70.8	4.	.50	70.1	5.	.60	69.3	6.	.72	68.4	5.	.81	67.6	3.
	-0.98	0.1	307.7	-1.	.30	296.3	3.	.40	291.1	5.	.50	284.6	7.	.61	276.3	7.	.73	264.6	4.	.80	255.3	1.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	218.8	-2.	.70	211.3	2.	.80	202.6	3.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
30.	1.0	0.1	145.9	-7.	.30	129.6	-3.	.39	124.7	-2.	.47	119.2	-1.	.61	110.6	1.	.70	104.2	3.	.80	96.7	5.
		0.25	100.1	-8.	.30	88.8	2.	.38	85.0	4.	.48	80.4	8.	.57	76.3	9.	.69	70.5	13.	.81	64.9	16.
		0.5	65.0	2.	.29	60.0	8.	.39	58.3	10.	.48	56.5	10.	.57	54.9	11.	.71	52.1	11.	.81	50.0	11.
		1.0	38.8	7.	.30	37.9	6.	.40	37.5	6.	.49	37.2	6.	.58	36.9	4.	.68	36.5	4.	.81	36.1	1.
	0.0	0.1	175.9	-3.	.31	158.5	4.	.42	151.5	2.	.50	145.8	1.	.60	138.5	-0.	.71	130.0	-1.	.79	122.5	-1.
		0.25	125.5	-4.	.32	114.1	-0.	.41	110.4	-0.	.49	107.0	1.	.61	101.8	1.	.71	97.4	2.	.80	91.2	4.
		0.5	91.0	1.	.31	83.6	7.	.40	81.2	7.	.50	78.6	8.	.60	75.8	8.	.70	73.0	8.	.80	70.3	8.
		1.0	53.7	13.	.31	52.3	14.	.39	51.9	13.	.49	51.4	13.	.60	50.8	10.	.70	50.4	8.	.80	49.8	6.
	-0.98	0.1	240.2	-10.	.30	222.9	-2.	.40	216.1	1.	.50	208.7	5.	.60	200.7	8.	.70	192.0	12.	.81	183.5	8.
		0.25	185.9	7.	.30	173.2	13.	.40	168.6	14.	.51	162.9	14.	.60	157.7	13.	.71	151.6	11.	.80	145.9	8.
		0.5	143.1	-4.	.30	138.3	-0.	.40	135.6	2.	.50	132.7	4.	.61	129.5	5.	.70	126.7	4.	.80	123.3	1.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 18

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	417.0	-5.	.30	405.6	-2.	.40	399.6	-1.	.50	391.7	1.	.60	380.7	2.	.70	363.8	3.	.81	332.5	6.
		0.25	277.9	-4.	.30	268.5	-1.	.40	264.1	1.	.50	258.6	3.	.60	252.0	4.	.69	243.5	6.	.80	236.7	8.
		0.5	168.9	-2.	.30	164.9	0.	.40	163.2	1.	.49	161.4	2.	.59	159.2	3.	.72	155.3	2.	.82	156.3	1.
		1.0	72.2	-1.	.30	71.2	0.	.39	70.9	1.	.49	70.5	1.	.60	70.1	1.	.70	69.5	1.	.80	69.0	0.
	0.0	0.1	446.5	-4.	.30	439.4	-2.	.40	433.7	-1.	.50	427.2	1.	.60	418.1	3.	.70	404.1	6.	.80	380.5	7.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	308.0	-3.	.60	301.0	-1.	.70	291.7	2.	.80	279.0	7.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
	-0.98	0.1	446.5	-4.	.30	446.5	-4.	.40	446.5	-4.	.50	446.5	-4.	.60	446.5	-4.	.70	446.5	-4.	.80	446.5	-4.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	310.7	-4.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
20.	1.0	0.1	317.7	-4.	.30	290.4	4.	.40	278.8	3.	.50	265.9	3.	.60	251.3	4.	.69	234.7	5.	.80	214.6	7.
		0.25	201.7	-7.	.30	185.4	-1.	.39	179.1	-0.	.49	171.9	2.	.58	165.1	3.	.69	155.4	6.	.79	140.6	10.
		0.5	118.6	-3.	.29	109.8	4.	.39	106.2	5.	.48	102.8	7.	.58	99.0	7.	.71	93.6	8.	.79	69.9	9.
		1.0	56.7	3.	.30	55.2	4.	.40	54.7	3.	.49	54.1	3.	.60	53.5	3.	.69	52.9	2.	.79	52.2	2.
	0.0	0.1	364.4	-0.	.30	339.0	7.	.40	328.0	8.	.51	314.0	7.	.61	298.9	7.	.72	278.9	7.	.80	260.7	7.
		0.25	247.7	6.	.31	229.4	10.	.40	222.5	10.	.50	215.1	10.	.60	205.5	10.	.70	195.3	11.	.80	183.2	11.
		0.5	165.1	4.	.30	156.8	9.	.40	153.0	9.	.49	148.0	11.	.51	141.7	11.	.70	135.9	12.	.80	129.7	12.
		1.0	79.6	1.	.30	78.6	2.	.40	77.8	3.	.50	76.9	4.	.60	76.0	5.	.70	75.0	6.	.80	74.0	6.
	-0.98	0.1	435.3	-2.	.30	421.0	2.	.40	413.1	4.	.50	403.5	6.	.59	392.9	9.	.73	371.3	8.	.80	359.0	7.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	302.1	-1.	.70	290.5	3.	.80	277.0	7.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
30.	1.0	0.1	191.2	0.	.31	167.7	3.	.40	159.7	2.	.49	150.6	3.	.61	135.1	8.	.70	124.1	12.	.79	112.1	17.
		0.25	115.6	-1.	.29	99.8	8.	.38	94.8	11.	.46	90.7	14.	.63	80.7	20.	.71	76.1	22.	.81	76.7	25.
		0.5	70.9	5.	.30	65.1	12.	.39	63.2	13.	.48	61.3	14.	.59	58.8	15.	.69	55.6	16.	.79	54.3	16.
		1.0	41.5	9.	.30	40.4	8.	.39	40.1	8.	.49	39.7	7.	.60	39.3	6.	.71	38.9	5.	.81	38.5	4.
	0.0	0.1	236.7	3.	.31	211.2	12.	.41	200.4	12.	.51	190.7	11.	.60	180.2	11.	.71	168.5	10.	.79	158.6	10.
		0.25	162.5	0.	.30	144.0	2.	.41	135.2	4.	.50	128.3	6.	.59	120.2	10.	.69	112.1	13.	.80	102.3	16.
		0.5	102.3	8.	.31	93.1	13.	.40	90.2	14.	.50	87.1	15.	.60	83.9	16.	.70	80.4	17.	.80	76.9	16.
		1.0	58.0	16.	.31	56.4	15.	.40	55.9	15.	.49	55.4	14.	.60	54.8	13.	.69	54.3	12.	.81	53.6	10.
	-0.98	0.1	335.1	-7.	.30	308.4	1.	.40	297.9	5.	.50	286.4	8.	.60	273.9	12.	.69	261.7	16.	.80	245.4	16.
		0.25	251.7	9.	.30	232.7	16.	.39	226.1	18.	.51	217.7	18.	.60	210.0	18.	.69	202.1	18.	.79	191.7	16.
		0.5	187.0	-2.	.30	180.2	2.	.40	176.4	4.	.50	172.4	6.	.51	168.0	7.	.71	163.5	7.	.80	159.3	5.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 19

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	306.3	-3.	.30	299.5	-1.	.40	296.0	0.	.50	291.4	1.	.60	284.8	1.	.69	275.8	2.	.79	260.7	0.
		0.25	223.8	-3.	.30	218.0	0.	.40	215.2	1.	.50	211.6	2.	.60	207.3	4.	.70	201.5	4.	.79	194.7	4.
		0.5	151.7	-3.	.30	148.9	-1.	.40	147.7	-0.	.50	146.2	1.	.60	144.5	2.	.69	142.7	3.	.79	140.2	2.
		1.0	84.9	1.	.30	83.9	2.	.40	83.5	2.	.51	83.1	1.	.62	82.6	1.	.71	82.1	-0.	.81	81.5	-2.
	0.0	0.1	324.0	-3.	.30	319.1	-1.	.40	316.2	-0.	.50	312.3	1.	.60	306.9	3.	.70	298.2	3.	.81	283.0	1.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	242.2	-3.	.60	237.9	-1.	.70	232.3	1.	.82	222.9	2.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
	-0.98	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	324.0	-3.	.70	324.0	-3.	.80	324.0	-3.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.80	243.8	-4.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
20.	1.0	0.1	247.9	0.	.30	231.5	4.	.39	224.7	4.	.49	216.7	4.	.59	208.1	4.	.70	195.1	5.	.79	183.1	5.
		0.25	174.1	1.	.30	163.0	4.	.40	158.6	4.	.49	153.8	5.	.59	148.3	7.	.70	141.5	8.	.79	135.1	7.
		0.5	122.8	-1.	.30	117.6	3.	.39	115.7	3.	.49	112.8	4.	.58	109.7	5.	.70	105.2	5.	.80	101.3	3.
		1.0	68.3	4.	.30	66.7	6.	.40	66.0	5.	.51	65.3	5.	.61	64.6	4.	.70	64.3	3.	.80	63.2	0.
	0.0	0.1	275.5	3.	.31	260.2	6.	.40	253.8	6.	.50	246.5	6.	.60	236.8	5.	.71	224.6	4.	.80	212.5	3.
		0.25	204.7	7.	.30	193.0	11.	.40	189.0	10.	.49	183.3	11.	.60	176.7	11.	.70	169.5	10.	.80	161.6	9.
		0.5	149.0	4.	.30	143.1	8.	.39	140.9	10.	.49	138.3	10.	.60	135.4	10.	.69	132.3	10.	.80	128.7	7.
		1.0	92.2	-0.	.30	91.2	1.	.40	90.4	2.	.50	89.6	3.	.60	88.7	4.	.69	87.8	5.	.79	86.8	3.
	-0.98	0.1	319.0	-1.	.30	308.7	2.	.40	304.0	3.	.50	298.2	5.	.60	291.0	6.	.72	280.8	4.	.80	271.4	1.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	238.6	-2.	.70	231.6	1.	.81	221.3	2.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
30.	1.0	0.1	167.2	6.	.29	151.6	12.	.39	145.9	12.	.48	140.2	12.	.58	134.2	11.	.70	125.3	11.	.81	117.5	12.
		0.25	121.1	5.	.30	110.2	8.	.40	105.3	10.	.49	100.8	12.	.60	95.1	14.	.69	90.1	16.	.79	85.0	18.
		0.5	83.6	9.	.30	77.4	13.	.40	75.2	14.	.50	72.8	14.	.60	70.4	14.	.70	68.0	15.	.81	65.2	14.
		1.0	50.6	9.	.30	49.3	11.	.39	48.9	11.	.49	48.5	10.	.58	48.0	9.	.70	47.5	8.	.81	46.9	6.
	0.0	0.1	197.4	6.	.30	180.5	14.	.41	173.6	14.	.51	166.6	12.	.61	159.0	11.	.70	151.9	10.	.80	143.8	9.
		0.25	147.1	10.	.31	135.9	13.	.42	131.4	11.	.49	128.2	11.	.61	123.1	10.	.69	119.1	10.	.79	113.3	10.
		0.5	112.6	8.	.31	104.7	11.	.40	102.1	11.	.50	99.3	11.	.59	96.4	11.	.69	92.3	12.	.80	89.7	11.
		1.0	69.8	16.	.30	68.0	16.	.40	67.4	15.	.49	66.9	15.	.60	66.2	13.	.69	65.6	12.	.80	64.9	9.
	-0.98	0.1	258.2	-2.	.30	242.4	5.	.40	236.0	7.	.49	229.9	9.	.61	220.7	11.	.71	211.5	10.	.80	203.7	7.
		0.25	207.3	11.	.30	194.6	15.	.40	190.0	16.	.50	185.0	16.	.59	179.7	15.	.70	173.6	14.	.79	167.5	11.
		0.5	164.3	-4.	.30	159.7	-1.	.40	157.0	1.	.50	154.2	2.	.60	151.3	4.	.69	148.5	6.	.80	144.9	4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 20

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	430.6	-4.	.30	420.6	-2.	.40	415.1	-1.	.50	407.8	1.	.60	397.7	3.	.70	383.2	4.	.81	355.4	6.
		0.25	303.6	-3.	.30	294.6	0.	.40	290.4	2.	.50	285.2	3.	.60	278.8	5.	.69	270.4	7.	.80	258.4	9.
		0.5	197.2	-3.	.30	193.3	-1.	.40	191.6	0.	.50	189.5	1.	.60	187.1	3.	.70	184.3	4.	.80	181.6	2.
		1.0	92.2	-1.	.30	91.0	0.	.40	90.5	1.	.50	90.0	1.	.60	89.4	1.	.70	88.8	1.	.80	88.1	0.
	0.0	0.1	457.9	-3.	.30	450.4	-2.	.40	445.9	-1.	.50	440.0	1.	.60	431.6	3.	.69	420.6	5.	.80	398.8	7.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	331.7	-3.	.60	325.2	-1.	.70	316.5	2.	.80	304.5	5.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
	-0.98	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.9	-3.	.70	457.9	-3.	.80	457.9	-3.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	334.2	-4.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
20.	1.0	0.1	340.6	-0.	.31	314.6	5.	.40	304.8	5.	.49	292.7	6.	.59	278.9	6.	.70	261.3	8.	.81	238.9	9.
		0.25	229.3	-0.	.30	213.4	3.	.40	207.1	5.	.50	200.0	6.	.59	192.8	7.	.70	183.1	9.	.80	169.7	12.
		0.5	146.8	2.	.30	136.5	7.	.41	132.4	7.	.51	128.0	9.	.62	122.8	10.	.70	118.4	10.	.80	113.0	11.
		1.0	72.1	3.	.30	70.1	6.	.39	69.4	7.	.49	68.7	7.	.59	67.8	6.	.70	66.9	6.	.80	66.0	6.
	0.0	0.1	383.2	1.	.30	360.3	7.	.40	350.1	7.	.50	338.2	8.	.61	323.2	8.	.72	304.2	7.	.80	286.5	7.
		0.25	274.6	8.	.30	256.8	12.	.40	249.8	12.	.49	242.5	12.	.60	233.4	13.	.71	222.3	13.	.80	211.2	13.
		0.5	193.5	6.	.30	185.1	10.	.39	182.1	11.	.50	177.2	12.	.59	172.0	13.	.71	164.5	13.	.81	157.5	13.
		1.0	101.4	-0.	.30	100.2	1.	.40	99.1	2.	.50	98.1	3.	.60	96.9	4.	.70	95.7	5.	.81	94.4	6.
	-0.98	0.1	450.3	-2.	.30	434.3	2.	.40	427.4	4.	.50	418.7	5.	.59	409.3	8.	.72	391.0	8.	.80	377.7	7.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	326.2	-1.	.70	315.4	2.	.80	302.7	6.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
30.	1.0	0.1	219.3	5.	.30	196.9	12.	.39	159.6	13.	.48	181.6	13.	.57	169.7	15.	.70	152.2	18.	.80	137.9	22.
		0.25	143.6	7.	.30	125.3	15.	.40	118.8	17.	.49	112.5	20.	.60	105.4	23.	.70	97.9	25.	.80	91.2	28.
		0.5	90.6	12.	.29	83.3	18.	.39	80.7	19.	.49	77.9	20.	.58	75.2	21.	.70	71.7	22.	.81	63.3	22.
		1.0	51.8	12.	.30	50.4	13.	.40	50.0	13.	.50	49.5	13.	.59	49.0	13.	.70	48.4	13.	.80	48.0	12.
	0.0	0.1	263.7	5.	.30	238.9	14.	.40	229.8	16.	.51	218.7	15.	.61	208.0	14.	.71	196.5	14.	.80	185.3	13.
		0.25	190.8	8.	.31	172.2	13.	.41	164.6	14.	.50	156.6	14.	.60	148.3	16.	.69	139.4	18.	.80	128.8	20.
		0.5	128.6	15.	.31	117.6	18.	.40	114.2	18.	.50	110.7	19.	.60	106.6	20.	.70	102.5	21.	.79	93.6	20.
		1.0	73.9	18.	.30	71.8	20.	.40	71.1	19.	.49	70.4	19.	.59	69.7	18.	.70	68.8	17.	.80	68.0	16.
	-0.98	0.1	356.6	-3.	.30	332.0	4.	.40	322.3	7.	.50	311.5	10.	.60	299.7	13.	.72	283.8	14.	.80	271.8	13.
		0.25	278.4	12.	.30	259.6	18.	.40	252.7	18.	.50	245.5	18.	.60	236.9	19.	.71	227.9	18.	.80	219.0	16.
		0.5	215.2	-2.	.30	208.5	-1.	.40	204.8	2.	.50	200.8	4.	.60	196.6	6.	.69	192.7	8.	.79	188.3	9.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 21

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	355.2	-3.	.30	346.5	-0.	.40	341.9	1.	.51	334.9	1.	.63	324.3	2.	.70	314.0	2.	.80	294.8	3.
		0.25	250.6	-3.	.30	243.5	-0.	.40	240.2	1.	.51	235.6	2.	.62	229.7	3.	.74	220.5	4.	.83	211.0	3.
		0.5	166.0	-3.	.30	162.8	-1.	.40	161.5	-0.	.50	159.8	1.	.60	157.9	2.	.70	155.4	3.	.79	152.5	2.
		1.0	96.7	0.	.30	95.9	1.	.40	95.5	2.	.50	95.2	2.	.60	94.8	2.	.72	94.3	-0.	.81	93.8	-3.
	0.0	0.1	378.1	-2.	.30	371.7	-0.	.40	368.0	1.	.50	363.0	2.	.60	356.0	4.	.70	345.0	5.	.81	325.7	4.
		0.25	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	273.1	-3.	.60	267.9	-1.	.70	260.9	2.	.80	251.4	5.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
	-0.98	0.1	378.1	-2.	.30	378.1	-2.	.40	378.1	-2.	.50	378.1	-2.	.60	378.1	-2.	.70	378.1	-2.	.80	378.1	-2.
		0.25	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	275.1	-3.	.60	275.1	-3.	.70	275.1	-3.	.80	275.1	-3.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
20.	1.0	0.1	280.3	-2.	.31	259.4	3.	.43	248.1	2.	.57	233.1	2.	.57	233.1	2.	.74	211.3	5.	.73	204.5	6.
		0.25	191.7	-3.	.31	178.5	2.	.42	172.4	3.	.55	165.1	4.	.67	156.2	6.	.67	156.2	6.	.78	147.2	7.
		0.5	131.6	-3.	.30	125.4	2.	.40	122.8	3.	.52	119.8	3.	.63	116.4	5.	.78	111.3	3.	.81	110.5	2.
		1.0	79.2	1.	.30	77.2	4.	.41	76.5	3.	.51	75.7	3.	.63	74.8	2.	.78	73.5	-2.	.80	73.3	-3.
	0.0	0.1	315.2	2.	.30	296.2	7.	.42	286.3	6.	.50	278.1	6.	.60	266.8	5.	.70	253.9	5.	.79	239.2	5.
		0.25	227.6	6.	.31	213.2	9.	.43	206.5	9.	.50	201.6	9.	.60	194.6	9.	.69	187.4	10.	.80	177.4	9.
		0.5	163.0	4.	.30	156.1	8.	.41	153.1	8.	.52	149.5	9.	.59	146.9	9.	.70	142.8	9.	.81	136.4	7.
		1.0	103.0	0.	.30	102.2	1.	.40	101.5	1.	.50	100.7	2.	.60	100.0	3.	.69	99.2	4.	.82	98.1	1.
	-0.98	0.1	371.7	-0.	.30	358.3	3.	.40	352.2	5.	.50	344.9	7.	.61	334.4	7.	.69	325.5	7.	.80	310.5	4.
		0.25	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	275.1	-3.	.60	268.7	-1.	.70	260.1	2.	.80	250.4	5.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
30.	1.0	0.1	183.7	-8.	.31	165.1	1.	.42	157.4	2.	.55	147.6	5.	.55	147.6	5.	.70	134.5	7.	.80	125.5	9.
		0.25	129.6	-4.	.31	118.0	4.	.41	113.7	6.	.54	108.2	8.	.67	102.2	9.	.67	102.2	9.	.79	96.1	10.
		0.5	95.6	-2.	.30	89.5	4.	.42	86.5	5.	.53	83.6	6.	.65	80.2	7.	.65	80.2	7.	.79	76.1	7.
		1.0	59.1	3.	.30	57.7	5.	.40	57.2	5.	.51	56.6	6.	.63	56.0	3.	.76	55.3	1.	.79	55.1	1.
	0.0	0.1	219.0	-6.	.30	199.0	2.	.42	190.2	2.	.51	183.2	2.	.60	175.5	3.	.70	166.3	3.	.81	154.0	3.
		0.25	160.8	-3.	.31	147.6	4.	.41	142.2	5.	.51	137.4	6.	.60	132.2	6.	.69	127.2	6.	.80	122.6	7.
		0.5	120.4	2.	.31	113.7	6.	.42	111.1	6.	.50	109.0	6.	.59	105.6	6.	.71	103.5	5.	.80	100.8	4.
		1.0	80.8	9.	.30	78.9	11.	.41	78.1	10.	.53	77.3	9.	.60	76.8	7.	.69	76.1	6.	.81	75.2	2.
	-0.99	0.1	293.3	-11.	.30	273.4	-4.	.40	265.5	-1.	.50	256.9	3.	.60	247.5	6.	.70	237.1	10.	.80	225.3	11.
		0.25	230.7	7.	.30	215.9	13.	.40	210.1	15.	.52	202.8	14.	.60	197.9	14.	.70	191.3	13.	.80	183.5	11.
		0.5	180.4	-4.	.30	175.1	-1.	.40	172.1	1.	.50	158.9	3.	.60	165.6	5.	.68	162.7	6.	.80	159.4	3.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 22

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	477.2	-4.	.30	464.7	-1.	.40	458.1	0.	.50	449.0	2.	.62	434.4	3.	.76	404.0	5.	.78	394.9	6.
		0.25	326.2	-3.	.30	316.1	-0.	.40	311.4	1.	.50	305.3	3.	.61	297.0	5.	.72	285.4	6.	.79	277.1	8.
		0.5	207.6	-2.	.30	203.1	-0.	.40	201.1	1.	.50	198.7	2.	.60	196.0	3.	.70	192.6	5.	.79	189.1	7.
		1.0	106.6	-1.	.30	105.3	1.	.40	104.8	1.	.50	104.2	2.	.60	103.6	2.	.70	102.9	2.	.78	102.3	2.
	0.0	0.1	510.0	-3.	.30	501.0	-1.	.40	495.7	-0.	.50	488.7	1.	.60	478.5	3.	.70	463.1	6.	.81	434.6	8.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	358.6	-2.	.60	351.1	-0.	.70	341.1	3.	.80	327.4	6.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
	-0.98	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	510.0	-3.	.60	510.0	-3.	.70	510.0	-3.	.80	510.0	-3.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	361.5	-3.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
20.	1.0	0.1	369.1	-3.	.30	339.0	3.	.43	323.5	3.	.57	302.1	4.	.57	302.1	4.	.74	270.7	7.	.81	253.5	8.
		0.25	243.6	-4.	.31	225.6	1.	.42	217.1	3.	.54	206.8	4.	.54	206.8	4.	.67	194.2	7.	.81	178.5	10.
		0.5	161.9	-3.	.30	154.0	2.	.41	150.6	3.	.53	145.4	3.	.55	138.9	4.	.72	134.9	5.	.80	129.7	5.
		1.0	84.7	2.	.30	82.5	4.	.41	81.7	4.	.51	80.8	4.	.52	79.8	4.	.75	76.7	2.	.81	76.1	2.
	0.0	0.1	419.6	1.	.30	392.0	7.	.40	379.9	8.	.51	365.4	7.	.61	348.9	7.	.71	329.0	7.	.80	307.8	8.
		0.25	293.6	6.	.31	273.6	10.	.40	266.3	10.	.49	258.2	10.	.60	248.1	11.	.70	236.7	11.	.81	223.3	12.
		0.5	203.3	5.	.30	193.6	9.	.39	190.1	10.	.48	186.6	10.	.59	181.6	11.	.70	176.4	11.	.81	170.3	10.
		1.0	116.8	1.	.30	115.4	2.	.40	114.3	3.	.50	113.1	4.	.60	111.8	5.	.70	110.5	6.	.81	109.1	6.
	-0.98	0.1	500.9	-1.	.30	481.8	2.	.40	473.0	4.	.50	462.4	6.	.59	451.0	9.	.73	428.3	9.	.79	414.3	8.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	352.2	-1.	.70	339.8	3.	.80	325.2	7.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
30.	1.0	0.1	232.6	-5.	.32	205.0	0.	.45	192.6	2.	.45	192.6	2.	.59	178.0	5.	.75	160.2	9.	.80	154.9	10.
		0.25	159.4	-6.	.31	142.9	3.	.42	134.8	6.	.54	125.9	10.	.67	115.7	14.	.67	115.7	14.	.79	105.9	16.
		0.5	104.9	2.	.30	96.4	8.	.41	93.2	10.	.53	89.7	12.	.65	85.8	12.	.73	83.4	13.	.81	80.3	13.
		1.0	62.5	6.	.31	60.9	7.	.41	60.3	7.	.53	59.7	6.	.65	59.0	5.	.77	58.3	4.	.80	58.1	3.
	0.0	0.1	281.5	-2.	.30	253.5	7.	.41	242.8	7.	.51	231.7	7.	.61	220.6	7.	.70	207.7	7.	.81	193.2	8.
		0.25	200.2	-2.	.32	181.7	2.	.40	176.5	4.	.49	170.3	5.	.60	162.7	6.	.70	155.2	7.	.80	147.4	8.
		0.5	147.0	0.	.30	135.2	7.	.40	131.1	8.	.50	127.1	9.	.60	122.5	9.	.69	118.2	10.	.80	113.2	10.
		1.0	86.6	13.	.30	84.3	14.	.40	83.6	13.	.49	82.9	13.	.60	82.0	12.	.70	81.2	10.	.79	80.4	8.
	-0.98	0.1	387.8	-9.	.30	359.0	-1.	.40	347.7	2.	.50	335.4	6.	.60	321.9	10.	.69	308.5	13.	.80	291.7	15.
		0.25	297.9	8.	.30	276.9	15.	.39	269.8	17.	.50	260.7	17.	.60	251.6	17.	.69	243.7	17.	.80	232.2	15.
		0.5	228.1	-2.	.30	220.8	1.	.40	216.4	3.	.50	211.8	5.	.60	206.9	7.	.70	201.9	6.	.80	196.6	6.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 23

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	372.9	-2.	.30	365.1	1.	.40	361.2	2.	.51	355.2	2.	.62	346.3	3.	.75	328.4	4.	.79	319.3	3.
		0.25	277.9	-2.	.30	271.1	1.	.40	267.9	2.	.50	263.7	3.	.61	258.1	4.	.72	250.1	5.	.79	244.2	5.
		0.5	193.0	-2.	.30	189.6	-0.	.40	188.2	0.	.50	186.4	1.	.60	184.4	2.	.70	181.9	4.	.80	178.8	5.
		1.0	120.5	-2.	.30	119.6	-1.	.40	119.2	-1.	.50	118.8	-1.	.60	118.4	-0.	.70	117.9	0.	.80	117.3	-1.
	0.0	0.1	393.0	-2.	.30	387.2	-0.	.40	384.2	0.	.50	379.9	2.	.60	373.6	3.	.70	364.5	5.	.79	350.2	4.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	299.0	-2.	.60	294.2	-1.	.70	287.7	1.	.80	278.6	5.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
	-0.98	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	393.0	-2.	.70	393.0	-2.	.80	393.0	-2.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	300.9	-3.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
20.	1.0	0.1	305.7	3.	.31	286.0	6.	.43	275.7	6.	.43	275.7	6.	.56	262.7	7.	.70	244.6	9.	.80	230.0	9.
		0.25	219.8	3.	.31	206.1	7.	.42	199.9	7.	.54	192.3	8.	.66	183.5	10.	.77	174.9	11.	.78	173.2	11.
		0.5	157.9	1.	.30	151.3	5.	.41	148.6	5.	.52	145.5	6.	.62	142.3	7.	.76	137.3	6.	.80	135.9	6.
		1.0	101.5	1.	.30	99.2	4.	.40	98.4	4.	.51	97.4	4.	.63	96.4	3.	.76	95.1	-0.	.80	94.6	-1.
	0.0	0.1	337.2	5.	.31	319.6	8.	.41	312.3	8.	.50	304.3	8.	.60	293.4	7.	.70	280.5	8.	.81	264.1	7.
		0.25	255.7	8.	.30	242.0	12.	.40	236.3	12.	.50	230.1	12.	.59	223.3	13.	.70	214.8	13.	.80	205.5	13.
		0.5	189.8	6.	.30	182.6	9.	.39	180.1	10.	.49	176.9	12.	.59	173.4	12.	.69	169.6	12.	.81	164.4	10.
		1.0	127.4	-2.	.30	126.5	-1.	.40	125.7	-1.	.50	124.9	0.	.60	124.1	1.	.70	123.2	1.	.80	122.3	2.
	-0.98	0.1	387.2	-0.	.30	375.7	3.	.40	370.3	4.	.50	363.7	6.	.60	355.6	6.	.70	345.2	6.	.81	332.1	3.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	294.9	-1.	.70	286.8	2.	.80	277.2	5.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	206.1	-3.	.80	205.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
30.	1.0	0.1	211.5	10.	.31	192.2	16.	.43	183.3	16.	.57	172.5	16.	.57	172.5	16.	.74	157.8	17.	.80	151.5	18.
		0.25	155.8	9.	.31	143.5	13.	.43	138.4	13.	.56	132.0	14.	.56	132.0	14.	.70	124.9	15.	.81	118.9	16.
		0.5	119.3	5.	.31	112.9	7.	.42	109.9	8.	.54	106.2	9.	.65	102.6	11.	.72	100.5	11.	.80	97.7	11.
		1.0	77.3	9.	.31	75.5	9.	.41	74.8	9.	.53	74.1	8.	.65	73.3	7.	.65	73.3	7.	.79	72.3	4.
	0.0	0.1	247.2	8.	.30	227.4	16.	.40	220.0	17.	.50	211.4	16.	.61	202.3	15.	.71	192.0	14.	.79	183.8	14.
		0.25	187.5	13.	.31	173.7	16.	.41	169.0	16.	.50	164.3	16.	.59	159.2	15.	.70	152.5	15.	.79	140.9	15.
		0.5	146.2	11.	.31	139.0	13.	.41	136.5	12.	.49	134.1	12.	.59	131.3	11.	.69	128.5	11.	.61	124.9	10.
		1.0	103.4	10.	.30	101.1	12.	.39	100.3	12.	.49	99.5	12.	.60	98.7	11.	.67	98.0	10.	.79	97.0	7.
	-0.98	0.1	317.4	2.	.30	299.3	8.	.40	292.0	10.	.50	284.0	13.	.61	273.7	13.	.69	266.0	13.	.80	253.9	11.
		0.25	258.7	11.	.30	244.1	16.	.40	238.7	16.	.50	232.7	16.	.59	226.4	16.	.69	219.5	16.	.81	210.8	14.
		0.5	208.1	-3.	.30	202.6	-0.	.40	199.4	1.	.50	196.1	3.	.60	192.5	5.	.69	189.2	6.	.61	184.3	6.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.

PREDICTED CAPACITIES AND ERRORS USING EQUATIONS FOR MOMENT MAGNIFICATION - COLUMN 24

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR	P_S/P	P_{EQ}	ERR
10.	1.0	0.1	496.7	-3.	.30	485.4	-1.	.40	479.5	0.	.50	471.8	2.	.61	459.8	3.	.73	437.1	5.	.80	417.6	7.
		0.25	359.3	-2.	.30	349.7	1.	.40	345.1	2.	.50	339.4	4.	.60	332.0	5.	.71	321.6	7.	.79	310.4	9.
		0.5	241.5	-1.	.30	237.0	0.	.40	235.0	1.	.50	232.7	2.	.60	229.9	3.	.70	226.0	5.	.80	222.5	7.
		1.0	135.9	1.	.30	134.4	2.	.40	133.7	2.	.51	133.0	2.	.61	132.3	2.	.72	131.4	2.	.81	130.6	0.
	0.0	0.1	526.5	-3.	.30	518.2	-1.	.40	513.4	-0.	.50	506.9	1.	.60	497.8	3.	.69	485.7	5.	.80	461.4	7.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	389.7	-2.	.60	382.7	-0.	.70	373.4	2.	.80	360.4	5.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
	-0.98	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.5	-3.	.70	526.5	-3.	.80	526.5	-3.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	392.4	-3.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
20.	1.0	0.1	399.4	1.	.31	371.1	6.	.43	356.6	6.	.55	338.3	7.	.55	338.3	7.	.70	311.9	9.	.79	292.6	11.
		0.25	277.8	2.	.31	259.2	6.	.42	250.6	7.	.54	240.8	8.	.66	228.8	11.	.66	226.8	11.	.80	213.4	13.
		0.5	195.0	0.	.30	186.5	4.	.40	183.1	5.	.52	179.1	6.	.63	173.3	7.	.77	164.4	8.	.81	161.3	7.
		1.0	109.3	3.	.30	106.6	6.	.40	105.6	5.	.51	104.5	5.	.62	103.3	5.	.74	101.8	4.	.79	101.2	3.
	0.0	0.1	445.3	3.	.30	420.1	8.	.40	409.4	9.	.50	397.2	8.	.60	381.8	8.	.71	362.3	9.	.80	346.3	9.
		0.25	327.8	8.	.30	308.4	12.	.40	300.8	13.	.49	292.6	13.	.60	282.5	14.	.70	270.5	14.	.81	256.4	15.
		0.5	237.2	6.	.30	227.6	10.	.39	224.1	11.	.49	219.9	12.	.59	215.4	13.	.70	210.2	13.	.80	204.4	13.
		1.0	147.8	-1.	.30	146.2	1.	.40	144.9	1.	.50	143.5	2.	.60	142.0	3.	.70	140.5	4.	.80	138.9	6.
	-0.98	0.1	518.1	-1.	.30	500.8	2.	.40	492.8	4.	.50	483.3	6.	.59	473.2	7.	.72	455.1	8.	.80	439.4	7.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	383.8	-1.	.70	372.1	2.	.80	358.4	6.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
30.	1.0	0.1	266.5	7.	.31	240.4	14.	.43	228.7	15.	.57	214.2	16.	.57	214.2	16.	.74	196.8	16.	.79	188.1	17.
		0.25	192.3	6.	.31	175.7	9.	.44	166.2	12.	.56	156.1	15.	.56	156.1	15.	.69	144.1	18.	.79	135.2	21.
		0.5	133.9	9.	.31	123.6	14.	.41	119.8	14.	.54	115.2	15.	.57	110.1	17.	.74	107.3	17.	.81	104.3	17.
		1.0	80.9	9.	.30	78.9	11.	.40	78.2	12.	.51	77.4	11.	.62	76.6	10.	.75	75.6	9.	.80	75.2	8.
	0.0	0.1	315.9	6.	.30	288.3	14.	.39	278.7	16.	.51	265.5	16.	.61	253.9	16.	.71	240.7	15.	.80	226.6	15.
		0.25	234.1	11.	.31	215.7	14.	.40	209.8	14.	.50	203.4	14.	.60	195.7	14.	.69	188.7	14.	.80	184.5	14.
		0.5	179.8	9.	.31	167.8	11.	.41	163.5	12.	.49	159.4	12.	.60	154.2	13.	.69	149.4	14.	.79	144.1	14.
		1.0	111.7	16.	.31	108.8	17.	.40	108.0	16.	.49	107.0	16.	.60	105.9	15.	.69	105.0	14.	.80	103.8	12.
	-0.98	0.1	416.5	-2.	.30	390.1	5.	.40	379.5	7.	.50	368.0	10.	.60	355.2	13.	.72	337.5	14.	.80	325.8	13.
		0.25	332.0	12.	.30	311.5	17.	.40	303.8	17.	.50	295.5	18.	.59	287.1	18.	.70	276.8	18.	.81	265.9	16.
		0.5	261.9	-2.	.30	254.4	1.	.40	250.1	2.	.50	245.6	4.	.60	240.9	6.	.70	235.8	8.	.80	230.5	10.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.

APPENDIX H

COLUMN CAPACITIES AND ASSOCIATED ERRORS BY USING MODIFIED EI

Tables H1 to H24 give the column capacities predicted by using the basic moment magnification equation (Eqn. 6.1) and a modified EI (Eqn. 6.28). The C_m factor was not restricted to a lower limit of 0.4 (Eqn. 6.29). Capacity reduction factors are not included.

The tables also give the errors associated with these results by a comparison with the analytical column capacities (Eqn. 5.3).

The following notation is used in the tables:

P_{EI}	column capacity (kips) predicted by using Eqn. 6.28 to estimate EI, the basic moment magnification equation (Eqn. 6.1) and the ACI Rectangular Stress Block
ERR	Error, as a percentage, calculated by Eqn. 5.3
P_S/P_{AN}	ratio of sustained load to ultimate load (P_{sus}/P_{an} in text)
E/H	ratio of eccentricity to section depth (e/h in text)
E_1/E_2	ratio of end eccentricities (e_1/e_2 in text)
L/H	ratio of column length to section depth (L/h in text)

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 1

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	218.5	-7.	.30	213.4	-5.	.40	211.6	-4.	.50	209.7	-4.	.60	207.5	-8.	.70	205.5	-13.	.78	203.5	-20.
		0.25	136.3	-3.	.30	130.4	1.	.40	128.4	3.	.50	126.5	3.	.59	124.4	3.	.76	120.8	-5.	.79	120.3	-7.
		0.5	63.1	3.	.31	59.6	6.	.43	58.2	6.	.51	57.2	6.	.62	56.0	5.	.69	55.1	5.	.80	53.7	4.
		1.0	22.5	-5.	.29	22.1	-4.	.40	21.9	-4.	.51	21.7	-5.	.60	21.5	-5.	.70	21.3	-4.	.81	21.0	-4.
	0.0	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	232.7	-5.	.60	232.7	-5.	.68	232.7	-8.	.79	232.4	-18.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.73	157.5	-5.	.78	156.0	-5.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
	-0.98	0.1	232.7	-5.	.30	232.7	-5.	.40	232.7	-5.	.50	232.7	-5.	.60	232.7	-5.	.70	232.7	-5.	.80	232.7	-5.
		0.25	159.3	-6.	.30	159.3	-6.	.40	159.3	-6.	.50	159.3	-6.	.60	159.3	-6.	.70	159.3	-6.	.80	159.3	-6.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.8	-2.	.50	80.8	-2.	.60	80.8	-2.	.70	80.8	-2.	.80	80.8	-2.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
20.	1.0	0.1	163.4	-3.	.32	143.1	2.	.41	137.4	0.	.52	131.2	-2.	.66	124.2	-7.	.70	122.0	-9.	.83	115.0	-16.
		0.25	86.8	6.	.31	75.5	10.	.43	71.8	10.	.55	68.2	9.	.61	66.4	8.	.69	64.2	6.	.79	61.5	2.
		0.5	41.4	7.	.33	37.4	9.	.41	36.5	9.	.52	35.3	8.	.54	34.2	8.	.69	33.6	7.	.79	32.7	7.
		1.0	18.5	1.	.30	17.7	0.	.41	17.4	-1.	.50	17.2	-1.	.51	16.9	-1.	.70	16.6	-1.	.80	16.3	-0.
	0.0	0.1	188.7	-0.	.31	163.7	11.	.42	155.4	10.	.47	151.3	9.	.58	143.6	7.	.70	136.0	1.	.81	129.0	-5.
		0.25	112.5	16.	.33	95.2	23.	.42	91.1	23.	.51	87.1	22.	.61	83.1	21.	.70	79.4	19.	.80	75.9	16.
		0.5	63.1	18.	.32	54.8	23.	.41	52.9	23.	.50	51.1	24.	.61	49.0	23.	.70	47.1	22.	.81	45.0	20.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.61	25.0	-3.	.71	25.0	-4.	.80	25.0	-5.
	-0.98	0.1	227.2	-3.	.30	193.4	12.	.40	182.8	17.	.50	172.8	22.	.60	163.0	24.	.68	156.0	23.	.81	145.6	19.
		0.25	148.3	1.	.30	124.4	17.	.40	117.6	22.	.50	111.2	26.	.60	105.2	30.	.70	99.6	34.	.81	94.0	33.
		0.5	80.8	-2.	.30	80.8	-2.	.40	80.0	-1.	.50	76.0	4.	.60	72.2	9.	.70	68.6	13.	.80	65.2	17.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.
30.	1.0	0.1	100.6	6.	.31	82.3	8.	.40	78.3	5.	.53	73.1	1.	.53	69.2	-2.	.69	67.1	-3.	.83	62.7	-3.
		0.25	53.2	3.	.33	45.1	5.	.43	42.9	5.	.55	40.8	4.	.67	38.9	4.	.71	38.2	3.	.80	36.8	2.
		0.5	29.1	6.	.31	26.1	3.	.42	25.3	5.	.51	24.6	4.	.63	23.7	3.	.71	23.1	4.	.80	22.5	2.
		1.0	15.2	2.	.32	14.3	-0.	.39	14.1	-1.	.51	13.8	-0.	.59	13.6	-1.	.71	13.3	-2.	.80	13.1	-3.
	0.0	0.1	111.3	18.	.28	91.9	26.	.41	85.0	25.	.51	80.2	23.	.59	76.8	21.	.72	71.6	16.	.83	67.6	11.
		0.25	64.7	26.	.32	53.8	25.	.38	52.1	24.	.50	49.2	23.	.61	46.7	22.	.71	44.6	21.	.79	42.9	19.
		0.5	39.1	24.	.29	34.5	24.	.39	33.1	24.	.51	31.7	24.	.61	30.5	23.	.70	29.5	22.	.79	28.5	21.
		1.0	22.5	3.	.32	20.5	6.	.40	20.2	6.	.50	19.6	7.	.60	19.1	7.	.69	18.6	8.	.80	18.1	8.
	-0.98	0.1	123.6	29.	.30	99.3	43.	.40	93.1	47.	.51	86.9	48.	.61	81.9	48.	.69	78.6	47.	.80	74.1	44.
		0.25	78.8	46.	.31	64.6	54.	.41	60.9	55.	.51	57.9	55.	.62	54.5	54.	.70	52.3	52.	.81	49.6	50.
		0.5	54.2	31.	.30	46.1	42.	.40	43.9	44.	.50	41.9	47.	.63	39.5	48.	.72	38.0	47.	.80	35.7	46.
		1.0	25.0	-2.	.30	25.0	-2.	.40	25.0	-2.	.50	25.0	-2.	.60	25.0	-2.	.70	25.0	-2.	.80	25.0	-2.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 2

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	344.3	-7.	.30	336.1	-5.	.40	333.2	-4.	.50	330.1	-3.	.60	327.0	-4.	.70	323.6	-8.	.82	319.3	-14.
		0.25	204.7	-2.	.30	194.7	3.	.40	191.4	5.	.50	187.6	6.	.61	183.1	5.	.71	178.8	2.	.80	175.2	-2.
		0.5	79.3	-2.	.31	74.6	[illegible]	.41	73.2	2.	.51	71.7	2.	.61	70.4	2.	.70	69.1	1.	.80	67.7	1.
		1.0	25.6	-9.	.31	25.1	-10.	.40	24.9	-11.	.51	24.7	-11.	.61	24.5	-10.	.72	24.3	-10.	.79	24.1	-11.
	0.0	0.1	367.4	-5.	.30	367.4	-5.	.40	367.4	-5.	.50	367.4	-5.	.60	367.4	-5.	.69	367.4	-5.	.81	367.0	-11.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	242.0	-4.	.80	236.7	-2.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
	-0.98	0.1	367.4	-5.	.30	367.4	-5.	.40	367.4	-5.	.50	367.4	-5.	.60	367.4	-5.	.70	367.4	-5.	.80	367.4	-5.
		0.25	244.2	-5.	.30	244.2	-5.	.40	244.2	-5.	.50	244.2	-5.	.60	244.2	-5.	.70	244.2	-5.	.80	244.2	-5.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	104.2	-1.	.60	104.2	-1.	.70	104.2	-1.	.80	104.2	-1.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
20.	1.0	0.1	252.6	-2.	.31	219.6	7.	.41	210.2	7.	.51	201.0	6.	.63	191.1	3.	.70	185.2	0.	.80	177.3	-4.
		0.25	122.3	6.	.32	104.4	11.	.43	99.1	12.	.54	94.2	12.	.67	89.1	11.	.71	87.5	10.	.80	84.3	7.
		0.5	51.6	2.	.32	46.5	2.	.41	45.2	3.	.51	43.9	2.	.62	42.5	2.	.69	41.6	2.	.78	40.5	2.
		1.0	21.3	-6.	.30	20.3	-7.	.40	20.0	-7.	.50	19.7	-6.	.61	19.4	-8.	.68	19.2	-7.	.81	18.7	-7.
	0.0	0.1	293.9	0.	.30	253.2	14.	.40	241.2	16.	.50	229.1	16.	.62	216.5	14.	.70	208.8	11.	.80	199.5	7.
		0.25	163.3	20.	.30	137.4	29.	.42	129.5	30.	.49	124.5	30.	.60	118.0	30.	.70	112.5	28.	.79	107.5	26.
		0.5	82.9	15.	.31	71.4	22.	.41	68.5	23.	.50	65.8	24.	.60	63.2	24.	.70	60.7	24.	.80	58.3	24.
		1.0	28.1	-1.	.30	28.1	-2.	.40	28.1	-3.	.52	28.1	-4.	.62	28.1	-5.	.70	28.1	-6.	.80	28.1	-7.
	-0.98	0.1	355.5	-2.	.30	299.3	14.	.40	282.3	19.	.50	266.5	23.	.59	253.5	27.	.73	234.7	29.	.81	225.2	27.
		0.25	219.4	6.	.30	180.6	22.	.40	169.9	27.	.50	160.2	31.	.60	151.4	35.	.70	143.2	39.	.80	135.7	42.
		0.5	104.2	-1.	.30	104.2	-1.	.40	104.2	-1.	.50	101.3	2.	.60	96.0	7.	.70	91.1	12.	.80	86.5	16.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.
30.	1.0	0.1	150.9	9.	.31	122.6	17.	.40	115.5	15.	.51	108.7	13.	.61	102.9	11.	.71	97.7	9.	.79	93.8	6.
		0.25	72.6	-1.	.31	61.0	-1.	.42	57.9	0.	.53	55.1	1.	.64	52.5	1.	.70	51.2	1.	.79	49.3	0.
		0.5	36.0	-1.	.32	32.0	-3.	.42	31.0	-3.	.51	30.1	-2.	.63	28.9	-1.	.71	28.2	-3.	.80	27.5	-2.
		1.0	17.5	-4.	.31	16.4	-8.	.43	16.0	-7.	.51	15.8	-7.	.60	15.5	-7.	.70	15.2	-7.	.80	14.9	-6.
	0.0	0.1	168.3	20.	.30	136.0	32.	.42	125.6	32.	.51	119.0	32.	.61	112.2	30.	.72	105.9	28.	.81	100.9	25.
		0.25	93.4	32.	.31	74.5	34.	.40	70.9	33.	.50	67.1	32.	.60	63.8	31.	.71	60.7	29.	.80	58.1	27.
		0.5	50.1	24.	.32	42.9	23.	.42	41.1	23.	.50	39.8	23.	.60	38.2	24.	.70	36.8	23.	.81	35.2	23.
		1.0	26.4	-5.	.32	24.0	-1.	.40	23.4	0.	.50	22.8	1.	.59	22.2	2.	.70	21.6	3.	.80	20.9	4.
	-0.98	0.1	185.1	31.	.30	149.3	45.	.40	139.6	48.	.49	131.8	51.	.60	123.2	54.	.69	117.0	53.	.81	109.9	51.
		0.25	112.1	50.	.30	90.7	59.	.40	85.3	60.	.50	80.5	61.	.60	76.2	61.	.71	72.1	60.	.80	68.8	59.
		0.5	71.9	31.	.30	59.7	42.	.40	56.6	45.	.50	53.8	48.	.62	50.7	49.	.71	48.6	50.	.80	46.6	50.
		1.0	28.1	-1.	.30	28.1	-1.	.40	28.1	-1.	.50	28.1	-1.	.60	28.1	-1.	.70	28.1	-1.	.80	28.1	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 3

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	224.1	-7.	.30	219.8	-5.	.40	218.1	-4.	.50	216.3	-4.	.60	214.5	-7.	.69	212.7	-10.	.80	210.2	-19.
		0.25	148.8	-3.	.30	143.6	0.	.40	141.8	2.	.50	139.8	3.	.59	137.9	4.	.72	134.9	-1.	.79	133.1	-5.
		0.5	75.3	3.	.31	72.0	5.	.41	70.8	6.	.51	69.6	5.	.61	68.3	5.	.69	67.3	3.	.79	65.3	3.
		1.0	27.4	-3.	.30	26.9	-2.	.40	26.7	-1.	.50	26.5	0.	.61	26.2	0.	.69	26.0	1.	.81	25.7	1.
	0.0	0.1	236.3	-5.	.30	236.3	-5.	.40	236.3	-5.	.50	236.3	-5.	.60	236.3	-5.	.72	236.3	-10.	.80	236.3	-17.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.8	-5.	.70	168.8	-5.	.80	168.8	-5.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
	-0.98	0.1	236.3	-5.	.30	236.3	-5.	.40	236.3	-5.	.50	236.3	-5.	.60	236.3	-5.	.70	236.3	-5.	.80	236.3	-5.
		0.25	168.8	-5.	.30	168.8	-5.	.40	168.8	-5.	.50	168.8	-5.	.60	168.8	-5.	.70	168.8	-5.	.80	168.8	-5.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	92.0	-2.	.80	92.0	-2.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.50	30.2	0.	.70	30.2	0.	.80	30.2	0.
20.	1.0	0.1	176.9	-5.	.30	158.8	0.	.40	153.0	-1.	.51	146.8	-3.	.62	140.9	-6.	.71	135.9	-10.	.79	130.8	-13.
		0.25	101.7	5.	.30	90.8	10.	.40	87.4	11.	.52	83.4	9.	.65	79.4	7.	.70	78.0	5.	.80	74.7	2.
		0.5	52.3	8.	.31	48.1	8.	.42	46.7	8.	.53	45.4	8.	.53	44.1	7.	.70	43.2	7.	.80	42.0	6.
		1.0	22.9	-1.	.30	22.0	3.	.40	21.7	4.	.49	21.5	3.	.59	21.2	4.	.71	20.8	3.	.80	20.5	4.
	0.0	0.1	202.5	-4.	.31	180.2	5.	.41	172.4	5.	.51	165.2	4.	.62	157.3	-0.	.72	150.5	-5.	.81	144.3	-8.
		0.25	131.0	10.	.29	115.4	18.	.40	110.0	18.	.50	105.7	18.	.62	100.3	16.	.71	96.0	14.	.80	92.4	11.
		0.5	79.2	11.	.29	71.4	17.	.39	68.8	18.	.50	66.3	19.	.61	63.7	18.	.71	61.3	16.	.80	59.3	15.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.
	-0.98	0.1	236.3	-5.	.30	213.1	5.	.40	202.9	10.	.50	192.9	14.	.61	181.8	16.	.69	174.1	15.	.80	164.6	12.
		0.25	168.8	-5.	.30	149.1	7.	.40	142.0	11.	.50	135.2	16.	.60	128.4	20.	.70	121.8	24.	.80	115.6	25.
		0.5	92.0	-2.	.30	92.0	-2.	.40	92.0	-2.	.50	92.0	-2.	.60	92.0	-2.	.70	91.6	-1.	.80	86.3	4.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.50	30.2	0.	.70	30.2	0.	.80	30.2	0.
30.	1.0	0.1	114.9	6.	.33	94.9	7.	.45	89.4	5.	.51	86.7	5.	.58	83.5	3.	.73	77.7	-1.	.79	75.2	-3.
		0.25	65.8	8.	.32	57.1	8.	.43	54.6	8.	.55	52.1	8.	.61	50.7	7.	.69	49.3	6.	.80	47.1	3.
		0.5	37.7	5.	.31	34.3	7.	.41	33.4	6.	.52	32.3	6.	.54	31.3	5.	.69	30.8	5.	.79	29.3	4.
		1.0	19.1	-1.	.30	18.3	1.	.40	18.0	1.	.49	17.7	3.	.58	17.5	3.	.71	17.1	2.	.80	16.8	3.
	0.0	0.1	127.2	13.	.28	106.7	21.	.42	98.5	20.	.51	93.8	18.	.61	89.0	16.	.69	85.4	13.	.78	81.7	10.
		0.25	79.9	24.	.27	69.6	24.	.42	65.0	23.	.50	62.7	22.	.61	59.9	21.	.72	57.1	19.	.80	55.0	17.
		0.5	51.6	22.	.28	46.5	23.	.40	44.4	22.	.50	42.9	21.	.61	41.4	20.	.71	39.8	19.	.82	38.4	17.
		1.0	30.0	-4.	.28	28.1	1.	.39	27.3	3.	.49	26.7	4.	.60	26.0	5.	.69	25.4	5.	.79	24.8	6.
	-0.98	0.1	141.6	24.	.31	115.2	37.	.42	107.9	39.	.51	102.5	40.	.61	96.8	41.	.69	92.5	39.	.81	86.9	36.
		0.25	97.8	37.	.31	82.1	46.	.41	78.0	47.	.50	74.4	47.	.61	70.7	47.	.73	66.8	44.	.80	64.4	43.
		0.5	72.5	19.	.30	63.0	30.	.40	60.3	33.	.50	57.8	36.	.60	55.4	38.	.73	52.4	38.	.81	50.5	37.
		1.0	30.2	0.	.30	30.2	0.	.40	30.2	0.	.50	30.2	0.	.60	30.2	0.	.70	30.2	0.	.80	30.2	0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 4

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	349.9	-7.	.30	342.5	-5.	.40	339.8	-4.	.50	337.0	-3.	.61	333.8	-4.	.69	331.1	-6.	.82	326.7	-12.
		0.25	220.1	-2.	.30	210.4	3.	.40	206.5	4.	.50	202.6	6.	.61	197.9	6.	.70	194.2	3.	.81	189.5	-0.
		0.5	93.6	-0.	.30	88.8	3.	.41	87.1	3.	.50	85.5	3.	.60	84.0	3.	.70	82.2	3.	.80	80.6	3.
		1.0	28.9	-4.	.30	28.3	-2.	.40	28.1	-2.	.51	27.9	-1.	.60	27.7	-1.	.71	27.5	-1.	.80	27.2	0.
	0.0	0.1	370.8	-5.	.30	370.8	-5.	.40	370.8	-5.	.50	370.8	-5.	.60	370.8	-5.	.69	370.8	-5.	.80	370.8	-10.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	252.7	-4.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
	-0.98	0.1	370.8	-5.	.30	370.8	-5.	.40	370.8	-5.	.50	370.8	-5.	.60	370.8	-5.	.70	370.8	-5.	.80	370.8	-5.
		0.25	255.7	-5.	.30	255.7	-5.	.40	255.7	-5.	.50	255.7	-5.	.60	255.7	-5.	.70	255.7	-5.	.80	255.7	-5.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	118.6	-1.	.80	118.6	-1.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
20.	1.0	0.1	267.3	-4.	.29	237.4	5.	.39	228.5	5.	.48	220.4	5.	.62	207.8	2.	.70	200.3	0.	.80	191.6	-3.
		0.25	138.4	8.	.30	121.1	14.	.41	115.7	14.	.51	110.8	14.	.60	107.0	14.	.70	102.5	12.	.80	98.5	10.
		0.5	62.3	4.	.29	57.0	7.	.39	55.4	8.	.49	53.8	8.	.60	52.1	9.	.70	50.6	8.	.80	49.0	8.
		1.0	24.4	-2.	.30	23.4	0.	.41	23.1	1.	.51	22.8	2.	.61	22.5	2.	.70	22.2	2.	.79	21.9	4.
	0.0	0.1	308.8	-3.	.30	270.7	10.	.40	258.9	12.	.50	246.9	12.	.62	234.2	10.	.70	225.6	8.	.81	214.2	4.
		0.25	183.2	16.	.31	156.3	26.	.41	149.4	27.	.50	143.1	27.	.60	136.1	27.	.72	129.0	26.	.81	123.4	23.
		0.5	100.1	12.	.31	87.9	20.	.40	84.6	21.	.50	81.5	22.	.60	78.4	23.	.71	74.9	22.	.80	72.3	22.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
	-0.98	0.1	370.8	-5.	.30	320.2	9.	.40	303.4	14.	.50	287.3	18.	.59	273.5	22.	.73	254.0	24.	.80	244.9	23.
		0.25	246.2	-1.	.30	207.0	15.	.40	195.5	20.	.50	185.0	24.	.60	175.1	28.	.70	165.9	32.	.80	157.2	36.
		0.5	118.6	-1.	.30	118.6	-1.	.40	118.6	-1.	.50	118.6	-1.	.60	118.6	-1.	.70	113.7	3.	.80	108.1	8.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.
30.	1.0	0.1	165.5	8.	.29	137.5	15.	.37	131.2	14.	.47	124.7	13.	.59	116.5	12.	.74	108.2	9.	.81	104.7	7.
		0.25	95.5	7.	.30	73.5	9.	.39	70.4	9.	.50	67.3	10.	.61	64.2	10.	.70	61.7	10.	.80	59.3	9.
		0.5	43.9	1.	.30	39.5	4.	.40	38.4	4.	.49	37.3	6.	.61	36.0	6.	.72	34.9	6.	.81	34.6	6.
		1.0	20.5	-1.	.31	19.4	-1.	.40	19.2	0.	.51	18.8	1.	.60	18.6	1.	.70	18.2	2.	.81	17.9	2.
	0.0	0.1	184.4	17.	.33	148.3	28.	.42	140.3	28.	.51	133.4	28.	.59	127.4	27.	.73	118.4	25.	.80	114.2	23.
		0.25	106.0	30.	.28	90.1	33.	.39	85.1	32.	.50	80.9	32.	.61	76.9	31.	.72	73.1	30.	.80	70.4	29.
		0.5	62.4	24.	.29	55.0	26.	.40	52.7	26.	.49	50.8	26.	.60	48.8	26.	.71	46.9	26.	.81	45.1	25.
		1.0	31.5	-5.	.30	30.5	-3.	.39	29.8	-1.	.49	29.1	1.	.59	28.3	2.	.69	27.7	4.	.80	26.9	6.
	-0.98	0.1	206.4	27.	.30	165.9	41.	.40	155.6	45.	.51	145.9	48.	.61	137.2	49.	.70	130.9	48.	.82	122.6	46.
		0.25	131.3	44.	.30	108.5	54.	.40	102.5	55.	.50	97.2	56.	.61	91.7	57.	.70	87.7	56.	.79	83.6	55.
		0.5	90.0	23.	.30	76.6	35.	.40	73.0	38.	.50	69.7	40.	.60	66.5	43.	.71	63.4	44.	.80	60.8	44.
		1.0	31.5	1.	.30	31.5	1.	.40	31.5	1.	.50	31.5	1.	.60	31.5	1.	.70	31.5	1.	.80	31.5	1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 5

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	259.4	-6.	.30	253.8	-4.	.40	251.6	-3.	.50	249.3	-3.	.60	246.7	-5.	.71	243.4	-11.	.79	240.8	-16.
		0.25	172.9	-3.	.30	167.2	0.	.40	165.2	2.	.49	163.1	3.	.61	160.4	3.	.70	158.0	2.	.82	154.8	-6.
		0.5	106.8	2.	.30	102.8	6.	.40	101.3	7.	.51	99.6	8.	.60	98.0	8.	.74	95.6	3.	.78	94.7	2.
		1.0	47.3	1.	.30	46.2	4.	.40	45.9	4.	.51	45.4	4.	.60	45.0	4.	.70	44.5	4.	.79	44.0	4.
	0.0	0.1	275.6	-4.	.30	275.6	-4.	.40	275.6	-4.	.50	275.6	-4.	.60	275.6	-4.	.69	275.6	-8.	.80	273.5	-16.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	195.4	-5.	.70	195.4	-5.	.79	195.4	-6.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
	-0.98	0.1	275.6	-4.	.30	275.6	-4.	.40	275.6	-4.	.50	275.6	-4.	.60	275.6	-4.	.70	275.6	-4.	.80	275.6	-4.
		0.25	195.4	-5.	.30	195.4	-5.	.40	195.4	-5.	.50	195.4	-5.	.60	195.4	-5.	.70	195.4	-5.	.80	195.4	-5.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	124.6	-5.	.70	124.6	-5.	.80	124.6	-5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
20.	1.0	0.1	202.0	-3.	.31	181.0	1.	.42	174.1	1.	.52	167.4	-0.	.61	161.8	-2.	.70	156.0	-5.	.80	149.1	-8.
		0.25	127.6	1.	.30	116.8	6.	.40	112.6	7.	.50	108.9	8.	.61	104.6	7.	.72	100.2	5.	.81	97.0	1.
		0.5	76.4	8.	.31	70.6	12.	.41	68.9	12.	.63	66.6	11.	.60	65.3	11.	.70	63.5	9.	.80	61.5	7.
		1.0	36.7	4.	.30	37.2	7.	.41	36.6	7.	.51	35.1	6.	.59	35.6	6.	.69	35.0	7.	.81	34.3	6.
	0.0	0.1	231.2	-1.	.31	204.8	7.	.41	197.1	7.	.50	189.8	7.	.63	178.8	4.	.73	170.9	1.	.80	165.0	-2.
		0.25	155.5	9.	.31	139.5	14.	.41	135.0	14.	.48	131.4	14.	.61	125.3	13.	.72	120.0	10.	.80	116.3	8.
		0.5	106.7	8.	.30	97.1	16.	.39	94.2	17.	.49	91.4	19.	.60	88.0	18.	.73	84.0	15.	.80	81.8	13.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.81	51.4	2.
	-0.98	0.1	275.6	-4.	.30	242.7	8.	.40	230.8	13.	.50	219.2	17.	.62	205.7	18.	.69	197.7	18.	.80	186.2	15.
		0.25	195.4	-5.	.30	178.4	4.	.40	170.5	9.	.50	162.7	13.	.60	155.2	17.	.70	147.8	21.	.79	141.3	22.
		0.5	124.6	-5.	.30	124.6	-5.	.40	124.6	-5.	.50	124.6	-5.	.60	123.5	-4.	.70	118.3	1.	.80	112.9	5.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.
30.	1.0	0.1	134.6	1.	.31	114.7	5.	.44	107.6	3.	.56	101.7	2.	.60	99.7	2.	.69	95.3	2.	.82	89.6	0.
		0.25	86.3	3.	.32	75.9	7.	.43	72.7	8.	.54	69.7	8.	.61	67.9	8.	.70	65.5	8.	.82	62.7	5.
		0.5	55.1	7.	.31	50.5	10.	.42	49.0	10.	.53	47.5	10.	.60	46.7	8.	.69	45.5	8.	.82	43.8	6.
		1.0	31.9	3.	.30	30.4	5.	.40	29.9	5.	.51	29.4	4.	.60	28.9	4.	.69	28.4	4.	.81	27.8	2.
	0.0	0.1	140.9	14.	.30	124.6	21.	.43	116.1	19.	.50	112.2	18.	.60	106.4	16.	.71	100.8	14.	.81	95.7	11.
		0.25	101.4	16.	.30	88.6	18.	.40	84.8	18.	.50	81.3	17.	.59	78.3	18.	.71	74.4	17.	.81	71.4	15.
		0.5	71.5	17.	.33	63.9	20.	.41	62.1	20.	.50	60.4	20.	.60	58.4	20.	.71	56.1	19.	.80	54.4	16.
		1.0	40.1	7.	.31	43.0	10.	.40	42.1	10.	.50	41.1	11.	.60	40.2	11.	.69	39.3	11.	.81	38.1	9.
	-0.98	0.1	162.5	26.	.30	134.5	38.	.42	126.1	40.	.50	120.6	41.	.61	113.8	41.	.69	108.8	40.	.78	103.6	37.
		0.25	120.7	34.	.31	102.7	41.	.41	98.3	42.	.50	94.1	43.	.62	89.0	42.	.72	85.0	41.	.80	81.6	39.
		0.5	95.4	20.	.30	84.1	30.	.40	80.7	32.	.50	77.5	35.	.60	74.5	38.	.68	72.2	39.	.81	68.4	35.
		1.0	52.9	0.	.30	52.9	0.	.40	52.9	0.	.50	52.9	0.	.60	52.9	0.	.70	52.9	0.	.80	52.9	0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 6

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	383.5	-7.	.30	374.8	-4.	.40	371.5	-3.	.50	368.1	-2.	.60	364.3	-3.	.70	360.3	-7.	.81	355.5	-11.
		0.25	244.2	-2.	.30	234.8	2.	.40	231.6	4.	.50	228.1	5.	.59	224.8	6.	.70	220.8	6.	.80	216.9	4.
		0.5	132.2	4.	.30	126.1	8.	.41	123.8	8.	.52	121.3	9.	.61	119.3	8.	.70	117.1	8.	.80	114.4	7.
		1.0	51.7	-0.	.30	50.5	1.	.41	50.1	1.	.51	49.7	1.	.60	49.2	2.	.71	48.7	2.	.80	48.2	2.
	0.0	0.1	408.4	-4.	.30	408.4	-4.	.40	408.4	-4.	.50	408.4	-4.	.60	408.4	-4.	.69	408.4	-5.	.80	407.3	-10.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	278.4	-3.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
	-0.98	0.1	408.4	-4.	.30	408.4	-4.	.40	408.4	-4.	.50	408.4	-4.	.60	408.4	-4.	.70	408.4	-4.	.80	408.4	-4.
		0.25	281.2	-5.	.30	281.2	-5.	.40	281.2	-5.	.50	281.2	-5.	.60	281.2	-5.	.70	281.2	-5.	.80	281.2	-5.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	163.2	-2.	.60	163.2	-2.	.70	163.2	-2.	.80	163.2	-2.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
20.	1.0	0.1	291.4	-3.	.31	257.9	4.	.42	247.6	4.	.52	237.5	3.	.61	229.3	2.	.69	221.3	0.	.80	211.7	-3.
		0.25	169.4	3.	.31	149.8	10.	.41	143.7	12.	.51	138.0	13.	.60	133.3	13.	.70	128.0	12.	.80	123.0	10.
		0.5	89.4	9.	.31	81.6	12.	.42	79.2	13.	.53	76.6	13.	.60	75.0	13.	.69	73.1	13.	.81	70.5	12.
		1.0	42.4	3.	.31	40.6	4.	.40	40.0	5.	.51	39.3	4.	.59	38.8	5.	.71	38.0	5.	.80	37.4	5.
	0.0	0.1	336.1	-1.	.30	294.9	10.	.41	281.4	12.	.50	270.0	12.	.61	256.4	11.	.72	244.3	8.	.81	234.4	5.
		0.25	211.4	13.	.30	187.1	19.	.41	178.3	20.	.50	171.6	21.	.61	163.1	21.	.70	156.7	21.	.79	150.0	20.
		0.5	130.8	16.	.32	116.1	22.	.40	112.4	23.	.50	108.6	24.	.60	104.3	24.	.71	100.0	24.	.80	96.5	23.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	56.8	0.
	-0.98	0.1	405.0	-4.	.30	348.9	11.	.40	330.6	15.	.50	313.2	20.	.60	296.5	24.	.69	281.6	25.	.80	266.0	23.
		0.25	279.0	-3.	.30	237.2	12.	.40	225.4	16.	.50	214.3	20.	.60	203.7	24.	.70	193.6	28.	.80	183.8	32.
		0.5	163.2	-2.	.30	163.2	-2.	.40	163.2	-2.	.50	157.1	2.	.60	149.7	6.	.70	142.6	11.	.80	135.7	15.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.
30.	1.0	0.1	187.5	2.	.30	156.4	9.	.40	148.2	8.	.52	139.2	7.	.60	133.9	6.	.69	128.0	5.	.80	121.5	4.
		0.25	107.8	4.	.31	93.2	10.	.42	88.8	10.	.54	84.7	11.	.60	82.5	11.	.71	79.1	11.	.80	76.2	10.
		0.5	63.2	7.	.31	57.4	9.	.41	55.6	10.	.52	53.9	9.	.60	52.7	10.	.71	51.0	10.	.81	49.5	9.
		1.0	34.7	4.	.31	32.9	3.	.42	32.3	4.	.52	31.7	4.	.60	31.3	4.	.71	30.6	3.	.79	30.2	3.
	0.0	0.1	205.3	16.	.30	170.7	26.	.42	158.7	25.	.50	151.7	25.	.60	143.9	24.	.71	136.2	22.	.81	129.4	20.
		0.25	128.7	21.	.31	109.7	24.	.40	105.0	24.	.49	100.5	24.	.60	95.6	24.	.69	91.8	24.	.81	87.3	23.
		0.5	83.6	22.	.30	74.1	25.	.41	71.2	25.	.51	68.7	25.	.59	66.7	25.	.70	64.2	25.	.79	62.1	24.
		1.0	50.8	6.	.30	47.1	9.	.40	45.9	10.	.49	45.0	11.	.60	43.7	12.	.69	42.7	12.	.81	41.4	12.
	-0.98	0.1	227.4	27.	.30	185.4	41.	.40	174.4	44.	.50	164.4	46.	.60	155.0	47.	.72	145.2	47.	.80	139.4	46.
		0.25	154.8	41.	.31	129.4	49.	.40	122.9	50.	.50	117.1	51.	.60	111.3	52.	.69	106.3	51.	.79	101.5	50.
		0.5	113.6	29.	.30	98.2	39.	.40	93.9	41.	.50	89.8	44.	.60	85.9	46.	.72	81.5	48.	.80	73.8	48.
		1.0	57.6	-0.	.30	57.6	-0.	.40	57.6	-0.	.50	57.6	-0.	.60	57.6	-0.	.70	57.6	-0.	.80	57.6	-0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 7

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	270.5	-6.	.30	266.2	-5.	.40	264.5	-4.	.50	262.6	-3.	.61	260.3	-5.	.69	258.1	-8.	.81	255.0	-15.
		0.25	193.0	-4.	.30	188.6	-1.	.40	186.8	-0.	.50	185.0	1.	.58	180.9	1.	.75	179.2	-1.	.79	178.2	-2.
		0.5	127.8	-1.	.30	124.3	1.	.40	123.0	2.	.50	121.6	3.	.60	120.0	5.	.71	118.0	3.	.79	116.5	0.
		1.0	60.8	0.	.30	59.8	2.	.40	59.4	2.	.50	59.0	2.	.60	58.5	3.	.71	57.9	2.	.79	57.4	2.
	0.0	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	283.0	-4.	.72	283.0	-8.	.80	283.0	-14.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	210.7	-5.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
	-0.98	0.1	283.0	-4.	.30	283.0	-4.	.40	283.0	-4.	.50	283.0	-4.	.60	283.0	-4.	.70	283.0	-4.	.80	283.0	-4.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	210.7	-5.	.70	210.7	-5.	.80	210.7	-5.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
20.	1.0	0.1	227.7	-7.	.30	210.8	-3.	.40	204.9	-3.	.50	199.0	-4.	.62	191.5	-6.	.71	185.3	-10.	.79	179.6	-13.
		0.25	154.6	-2.	.30	145.2	1.	.40	142.0	1.	.49	138.9	1.	.61	134.5	0.	.71	130.7	1.	.80	126.6	-5.
		0.5	99.2	3.	.31	93.5	7.	.41	91.6	7.	.52	89.5	6.	.61	87.6	5.	.70	85.6	3.	.80	83.6	-1.
		1.0	51.7	2.	.31	50.0	4.	.40	49.5	3.	.50	48.8	3.	.61	48.2	3.	.70	47.5	2.	.80	46.8	1.
	0.0	0.1	257.5	-7.	.30	238.7	-1.	.40	231.1	-1.	.50	223.9	-1.	.62	214.5	-4.	.72	206.0	-8.	.80	198.6	-12.
		0.25	188.1	0.	.30	174.9	5.	.40	170.3	6.	.49	165.7	6.	.61	160.1	4.	.71	155.1	2.	.80	150.1	-1.
		0.5	137.3	-2.	.30	128.8	5.	.39	125.9	7.	.50	122.6	8.	.60	119.2	8.	.73	114.7	4.	.81	111.5	0.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
	-0.98	0.1	283.0	-4.	.30	281.3	-3.	.40	272.2	0.	.51	261.4	4.	.60	250.6	5.	.72	237.3	4.	.81	226.9	2.
		0.25	210.7	-5.	.30	210.7	-5.	.40	210.7	-5.	.50	210.7	-5.	.60	203.6	-1.	.70	195.3	3.	.80	187.4	6.
		0.5	141.8	-4.	.30	141.8	-4.	.40	141.8	-4.	.50	141.8	-4.	.60	141.8	-4.	.70	141.8	-4.	.80	141.8	-4.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.
30.	1.0	0.1	165.7	-0.	.33	144.7	1.	.44	138.2	-0.	.56	131.5	-1.	.59	129.9	-1.	.72	122.7	-2.	.80	117.9	-5.
		0.25	114.6	-1.	.30	103.8	1.	.41	100.3	2.	.52	97.0	2.	.60	94.1	2.	.70	91.3	1.	.79	88.3	-3.
		0.5	76.1	3.	.31	70.9	4.	.42	69.2	3.	.53	67.5	3.	.60	66.2	3.	.73	64.2	-0.	.79	63.2	-2.
		1.0	43.8	-1.	.30	42.1	2.	.41	41.5	2.	.51	40.9	0.	.59	40.4	0.	.71	39.7	-1.	.81	39.1	-2.
	0.0	0.1	182.4	5.	.30	158.6	11.	.43	150.0	10.	.51	144.6	9.	.60	138.6	8.	.72	131.3	6.	.81	126.0	2.
		0.25	135.8	8.	.30	122.0	10.	.41	116.9	9.	.50	113.2	9.	.60	109.2	8.	.70	105.1	7.	.81	100.7	4.
		0.5	99.9	8.	.29	92.1	10.	.40	89.5	11.	.50	87.0	11.	.60	84.4	10.	.71	81.6	8.	.81	79.3	4.
		1.0	65.4	-2.	.30	61.9	1.	.40	60.7	1.	.50	59.5	2.	.60	58.3	2.	.70	56.9	1.	.79	55.8	-1.
	-0.98	0.1	205.1	15.	.30	174.9	23.	.40	165.7	24.	.50	157.9	26.	.59	150.5	26.	.71	142.2	25.	.80	135.2	22.
		0.25	164.2	18.	.31	144.6	26.	.40	139.2	28.	.50	133.6	28.	.60	128.0	28.	.70	122.6	27.	.80	117.1	23.
		0.5	137.3	-1.	.30	123.9	9.	.40	119.6	12.	.50	115.5	15.	.60	111.3	18.	.69	107.6	21.	.82	102.0	18.
		1.0	66.4	-1.	.30	66.4	-1.	.40	66.4	-1.	.50	66.4	-1.	.60	66.4	-1.	.70	66.4	-1.	.80	66.4	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 8

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	395.4	-7.	.30	388.3	-5.	.40	385.6	-4.	.50	382.6	-3.	.60	379.4	-3.	.70	375.7	-6.	.80	371.4	-9.
		0.25	269.4	-2.	.30	261.4	1.	.40	258.5	2.	.50	255.4	3.	.60	252.1	4.	.68	249.0	5.	.80	244.3	3.
		0.5	157.6	3.	.30	151.8	6.	.40	149.7	7.	.51	147.3	7.	.60	145.4	7.	.70	142.6	6.	.81	139.7	5.
		1.0	65.2	-1.	.30	64.0	1.	.41	63.5	1.	.50	63.1	1.	.60	62.5	2.	.70	61.9	2.	.79	61.3	2.
	0.0	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.6	-4.	.69	415.6	-4.	.80	415.6	-9.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	300.2	-4.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
	-0.98	0.1	415.6	-4.	.30	415.6	-4.	.40	415.6	-4.	.50	415.6	-4.	.60	415.6	-4.	.70	415.6	-4.	.80	415.6	-4.
		0.25	300.2	-4.	.30	300.2	-4.	.40	300.2	-4.	.50	300.2	-4.	.60	300.2	-4.	.70	300.2	-4.	.80	300.2	-4.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.60	71.8	-1.
20.	1.0	0.1	320.8	-6.	.30	292.2	-0.	.40	282.6	0.	.50	272.7	0.	.51	262.7	-0.	.70	253.8	-2.	.79	244.3	-4.
		0.25	203.2	0.	.30	184.6	7.	.39	178.7	8.	.49	172.9	9.	.61	166.1	9.	.70	160.4	8.	.80	154.4	6.
		0.5	114.9	7.	.31	106.8	9.	.41	104.3	9.	.51	101.6	10.	.60	99.3	10.	.70	96.8	9.	.79	94.2	8.
		1.0	54.8	0.	.30	52.9	4.	.40	52.2	4.	.50	51.5	4.	.59	50.8	4.	.70	50.1	5.	.81	49.2	4.
	0.0	0.1	366.3	-6.	.30	331.8	4.	.40	319.7	5.	.50	307.4	5.	.60	295.3	4.	.72	281.0	2.	.80	271.6	-1.
		0.25	250.4	6.	.31	227.0	13.	.40	220.1	13.	.49	213.5	14.	.61	204.6	14.	.72	195.4	14.	.81	187.8	12.
		0.5	167.1	7.	.30	152.6	15.	.40	148.1	15.	.49	144.0	16.	.60	138.8	17.	.71	133.6	16.	.81	128.8	14.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
	-0.98	0.1	415.6	-4.	.30	393.5	2.	.40	377.1	6.	.50	360.2	10.	.59	344.3	13.	.73	321.5	14.	.79	309.9	14.
		0.25	300.2	-4.	.30	293.5	-2.	.40	281.3	2.	.50	269.2	7.	.60	257.3	11.	.70	245.5	15.	.80	233.9	19.
		0.5	185.6	-3.	.30	185.6	-3.	.40	185.6	-3.	.50	185.6	-3.	.60	185.6	-3.	.70	185.6	-3.	.80	185.6	-3.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.
30.	1.0	0.1	221.0	2.	.33	186.8	6.	.45	175.9	6.	.57	166.2	6.	.60	164.3	6.	.70	156.8	5.	.81	149.0	3.
		0.25	137.7	4.	.31	122.0	8.	.41	117.4	8.	.52	112.8	9.	.60	109.9	9.	.71	105.2	9.	.81	101.5	7.
		0.5	84.9	6.	.32	78.1	7.	.42	76.0	7.	.53	73.9	7.	.61	72.3	7.	.70	70.6	6.	.81	63.5	6.
		1.0	46.0	-1.	.30	44.0	2.	.40	43.4	2.	.50	42.7	3.	.60	42.1	3.	.71	41.3	3.	.79	40.8	3.
	0.0	0.1	242.8	10.	.33	203.7	18.	.41	194.8	18.	.50	186.5	18.	.60	176.9	17.	.71	167.3	16.	.81	159.9	14.
		0.25	165.3	17.	.30	144.9	19.	.40	139.0	19.	.50	133.2	19.	.59	128.3	19.	.70	122.6	19.	.80	117.9	18.
		0.5	113.7	17.	.32	102.2	19.	.41	99.4	19.	.49	96.9	19.	.59	93.7	19.	.71	90.2	18.	.79	87.8	17.
		1.0	70.3	-3.	.30	65.9	2.	.40	64.6	4.	.48	63.3	4.	.59	61.8	5.	.70	60.3	5.	.79	59.0	9.
	-0.98	0.1	271.3	20.	.29	227.3	31.	.42	211.0	34.	.50	202.3	36.	.60	191.9	37.	.70	182.1	38.	.79	173.0	36.
		0.25	201.4	29.	.30	172.5	38.	.40	164.8	40.	.50	157.4	41.	.60	150.3	42.	.70	143.2	41.	.81	136.6	40.
		0.5	158.0	13.	.30	139.6	23.	.40	134.1	26.	.50	128.9	29.	.60	123.9	32.	.69	119.6	34.	.80	114.4	34.
		1.0	71.8	-1.	.30	71.8	-1.	.40	71.8	-1.	.50	71.8	-1.	.60	71.8	-1.	.70	71.8	-1.	.80	71.8	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 9

L/H	E_1/E_2	ξ/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	300.0	-5.	.30	293.7	-3.	.40	291.2	-2.	.50	288.5	-2.	.61	285.0	-4.	.70	281.7	-7.	.79	277.8	-12.
		0.25	205.8	-3.	.30	200.1	-0.	.40	197.9	1.	.50	195.6	2.	.61	192.6	2.	.70	190.0	2.	.79	187.1	-2.
		0.5	135.1	-2.	.30	131.9	1.	.40	130.7	2.	.50	129.4	3.	.60	128.0	4.	.70	126.4	5.	.79	124.3	2.
		1.0	70.7	3.	.30	69.3	4.	.40	68.8	4.	.51	68.2	5.	.60	67.6	5.	.71	66.8	4.	.80	66.1	3.
	0.0	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.4	-3.	.72	318.0	-8.	.80	315.0	-12.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.80	229.1	-4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
	-0.98	0.1	318.4	-3.	.30	318.4	-3.	.40	318.4	-3.	.50	318.4	-3.	.60	318.4	-3.	.70	318.4	-3.	.80	318.4	-3.
		0.25	229.1	-4.	.30	229.1	-4.	.40	229.1	-4.	.50	229.1	-4.	.60	229.1	-4.	.70	229.1	-4.	.80	229.1	-4.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
20.	1.0	0.1	238.8	-2.	.31	216.6	2.	.42	209.3	1.	.51	202.2	1.	.60	195.8	2.	.74	185.0	-2.	.80	183.4	-4.
		0.25	158.6	0.	.31	147.4	4.	.40	143.9	5.	.50	140.1	5.	.60	136.0	6.	.72	131.6	4.	.80	128.1	1.
		0.5	106.4	1.	.30	100.0	7.	.41	97.6	8.	.50	95.5	9.	.60	93.3	9.	.72	90.4	6.	.80	88.3	3.
		1.0	58.4	4.	.31	56.2	7.	.40	55.4	7.	.51	54.5	7.	.60	53.8	6.	.69	53.0	6.	.81	51.8	4.
	0.0	0.1	272.5	-1.	.31	245.2	6.	.41	236.2	6.	.50	228.0	6.	.60	218.1	6.	.70	208.5	3.	.80	199.6	1.
		0.25	193.1	5.	.31	176.8	10.	.41	171.7	11.	.49	166.9	11.	.60	161.0	11.	.72	154.6	9.	.80	149.8	6.
		0.5	139.7	2.	.30	131.0	8.	.39	128.4	10.	.49	125.4	10.	.59	122.0	11.	.71	118.1	10.	.81	117.2	6.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	76.7	-0.
	-0.98	0.1	318.4	-3.	.30	290.6	6.	.40	277.8	10.	.50	264.3	14.	.62	249.3	15.	.72	235.7	15.	.81	223.9	13.
		0.25	229.1	-4.	.30	226.4	-4.	.40	219.5	0.	.50	210.6	4.	.60	201.7	8.	.70	192.7	12.	.81	182.8	15.
		0.5	150.2	-4.	.30	150.2	-4.	.40	150.2	-4.	.50	150.2	-4.	.60	150.2	-4.	.70	150.2	-4.	.80	150.2	-4.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.
30.	1.0	0.1	165.4	2.	.32	143.5	7.	.44	135.9	6.	.58	128.3	5.	.60	127.3	5.	.71	121.2	5.	.80	116.7	4.
		0.25	116.5	-1.	.31	104.5	3.	.43	100.5	4.	.53	97.1	5.	.60	94.7	5.	.70	91.4	6.	.78	88.7	5.
		0.5	79.9	4.	.32	74.0	6.	.42	72.2	6.	.53	70.1	7.	.60	68.8	6.	.69	67.2	5.	.79	65.4	3.
		1.0	48.2	2.	.30	46.2	5.	.41	45.4	4.	.52	44.6	4.	.59	44.1	4.	.71	43.2	3.	.81	42.3	2.
	0.0	0.1	180.8	12.	.32	154.4	20.	.42	147.3	19.	.50	141.7	17.	.60	135.7	16.	.71	128.8	14.	.80	123.0	13.
		0.25	134.2	12.	.32	119.8	14.	.41	115.6	13.	.50	112.0	13.	.60	107.8	13.	.70	103.6	13.	.81	98.9	12.
		0.5	101.6	8.	.32	92.5	12.	.40	90.3	13.	.48	88.2	14.	.60	85.1	14.	.71	82.2	13.	.80	79.8	11.
		1.0	69.2	5.	.31	65.0	8.	.40	63.7	8.	.49	62.5	9.	.60	60.9	8.	.69	59.7	8.	.80	59.1	6.
	-0.98	0.1	200.9	24.	.31	169.2	35.	.42	158.9	36.	.49	153.3	37.	.57	147.2	38.	.68	139.1	37.	.80	130.7	34.
		0.25	159.9	26.	.31	139.7	34.	.41	133.8	35.	.50	129.1	35.	.61	123.1	36.	.72	117.3	34.	.79	113.7	33.
		0.5	133.7	7.	.30	120.5	16.	.40	116.3	19.	.50	112.1	22.	.60	108.0	25.	.69	104.5	27.	.79	100.2	26.
		1.0	78.4	-1.	.30	78.4	-1.	.40	78.4	-1.	.50	78.4	-1.	.60	78.4	-1.	.70	78.4	-1.	.80	78.4	-1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 10

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	422.5	-6.	.30	413.2	-4.	.40	409.7	-3.	.50	405.9	-2.	.60	401.6	-3.	.70	396.9	-5.	.81	391.1	-10.
		0.25	278.3	-2.	.30	269.2	2.	.40	265.8	3.	.50	262.4	4.	.60	258.6	5.	.71	254.2	5.	.81	249.5	4.
		0.5	172.6	2.	.30	166.0	6.	.40	163.7	7.	.50	161.1	8.	.61	158.1	9.	.71	155.2	3.	.80	152.2	7.
		1.0	76.2	2.	.30	74.6	4.	.40	73.9	4.	.51	73.2	4.	.60	72.6	4.	.70	71.7	5.	.79	71.0	5.
	0.0	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.5	-4.	.69	449.5	-5.	.81	446.6	-10.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	314.9	-4.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
	-0.98	0.1	449.5	-4.	.30	449.5	-4.	.40	449.5	-4.	.50	449.5	-4.	.60	449.5	-4.	.70	449.5	-4.	.80	449.5	-4.
		0.25	314.9	-4.	.30	314.9	-4.	.40	314.9	-4.	.50	314.9	-4.	.60	314.9	-4.	.70	314.9	-4.	.80	314.9	-4.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	198.7	-3.	.80	198.7	-3.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
20.	1.0	0.1	328.4	-3.	.31	294.0	3.	.42	283.3	3.	.52	272.7	3.	.56	263.8	3.	.71	252.6	1.	.80	243.2	-1.
		0.25	205.5	2.	.30	188.5	7.	.40	182.8	8.	.50	176.7	9.	.60	170.2	10.	.71	163.3	10.	.80	153.1	8.
		0.5	123.3	9.	.32	113.8	12.	.42	110.8	12.	.53	107.7	12.	.60	105.7	13.	.71	102.4	12.	.79	99.7	11.
		1.0	62.4	4.	.30	59.9	7.	.40	59.1	7.	.51	58.1	7.	.60	57.3	8.	.70	56.3	7.	.80	55.4	7.
	0.0	0.1	377.1	-1.	.30	335.7	8.	.41	321.1	9.	.50	309.3	10.	.61	294.5	9.	.71	281.1	8.	.81	268.9	5.
		0.25	251.3	9.	.31	226.1	15.	.40	218.5	16.	.49	211.6	16.	.60	203.6	17.	.70	195.5	16.	.80	188.5	15.
		0.5	172.7	8.	.30	157.1	16.	.39	152.5	13.	.50	147.2	20.	.60	142.0	20.	.70	137.0	20.	.80	132.0	14.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.81	82.9	3.
	-0.98	0.1	449.5	-4.	.30	397.2	8.	.40	377.9	13.	.50	358.9	17.	.59	341.3	20.	.70	322.8	21.	.79	306.2	21.
		0.25	314.9	-4.	.30	289.8	4.	.40	276.8	9.	.50	264.2	13.	.60	252.0	17.	.70	240.0	21.	.80	228.3	25.
		0.5	198.7	-3.	.30	198.7	-3.	.40	198.7	-3.	.50	198.7	-3.	.60	198.7	-3.	.70	191.0	1.	.80	182.7	5.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.
30.	1.0	0.1	219.1	0.	.31	187.6	7.	.42	177.9	6.	.54	167.3	5.	.60	163.1	6.	.70	155.3	6.	.80	147.7	6.
		0.25	140.0	3.	.31	123.3	9.	.42	118.1	9.	.54	113.6	10.	.60	110.4	10.	.69	106.7	11.	.81	102.1	10.
		0.5	89.1	6.	.31	81.7	10.	.42	79.3	11.	.52	76.9	11.	.60	75.4	10.	.70	73.1	10.	.79	71.4	10.
		1.0	51.3	3.	.30	48.9	5.	.41	48.1	5.	.51	47.3	5.	.60	46.5	5.	.69	45.8	6.	.81	44.3	5.
	0.0	0.1	239.7	13.	.30	202.8	23.	.43	190.3	22.	.50	183.0	21.	.60	174.1	20.	.70	165.8	19.	.80	157.7	18.
		0.25	164.7	16.	.31	142.9	19.	.42	136.4	19.	.50	131.7	19.	.59	126.7	20.	.70	121.3	20.	.80	116.2	20.
		0.5	115.5	17.	.31	104.0	21.	.41	100.4	21.	.49	97.7	22.	.60	94.2	22.	.70	91.0	22.	.80	87.9	20.
		1.0	74.4	6.	.30	69.4	11.	.40	67.9	11.	.49	66.4	11.	.59	64.8	12.	.69	63.3	12.	.80	61.5	12.
	-0.98	0.1	266.0	25.	.30	220.4	38.	.41	207.2	40.	.50	197.6	42.	.60	187.2	43.	.70	177.0	43.	.80	167.7	42.
		0.25	196.1	34.	.31	167.3	42.	.40	159.9	43.	.50	152.9	44.	.60	145.6	45.	.70	139.0	44.	.81	132.3	43.
		0.5	154.4	20.	.30	135.9	30.	.40	130.5	32.	.50	125.3	35.	.60	120.3	38.	.69	116.0	40.	.80	110.7	39.
		1.0	85.3	1.	.30	85.3	1.	.40	85.3	1.	.50	85.3	1.	.60	85.3	1.	.70	85.3	1.	.80	85.3	1.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 11

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	315.7	-6.	.30	311.3	-4.	.40	309.5	-4.	.49	307.5	-3.	.62	304.5	-5.	.70	301.9	-7.	.79	299.0	-10.
		0.25	231.6	-4.	.30	227.3	-2.	.40	225.6	-1.	.50	223.7	-0.	.60	221.7	1.	.70	219.0	0.	.80	216.3	-4.
		0.5	159.6	-3.	.30	157.0	-1.	.40	156.0	-1.	.50	154.9	0.	.60	153.6	1.	.70	152.2	2.	.81	150.4	-0.
		1.0	89.4	1.	.30	88.1	3.	.40	87.6	3.	.51	87.0	3.	.61	86.4	3.	.71	85.7	2.	.80	84.9	1.
	0.0	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.9	-3.	.71	328.9	-6.	.79	328.9	-10.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
	-0.98	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.50	328.9	-3.	.60	328.9	-3.	.70	328.9	-3.	.80	328.9	-3.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
20.	1.0	0.1	273.9	-7.	.30	257.6	-4.	.40	252.0	-5.	.49	245.9	-5.	.61	238.1	-5.	.72	229.5	-8.	.81	222.5	-12.
		0.25	194.1	-4.	.30	184.9	-2.	.39	181.6	-1.	.49	178.2	-1.	.60	174.0	-1.	.72	169.5	-4.	.79	166.4	-6.
		0.5	136.5	-4.	.30	131.6	-0.	.40	129.5	1.	.49	127.4	2.	.61	124.7	2.	.72	121.9	-2.	.81	119.3	-6.
		1.0	77.6	1.	.30	75.4	3.	.41	74.6	2.	.51	73.8	3.	.60	72.9	3.	.70	71.9	1.	.80	71.0	-1.
	0.0	0.1	308.0	-7.	.30	290.1	-3.	.41	282.8	-4.	.50	276.1	-4.	.60	267.3	-4.	.72	256.6	-8.	.81	247.5	-12.
		0.25	235.3	-3.	.30	222.8	1.	.40	218.2	1.	.49	213.6	2.	.60	208.1	1.	.71	202.1	-2.	.80	196.3	-5.
		0.5	171.9	-4.	.30	168.8	-2.	.40	166.0	-1.	.49	163.4	1.	.59	160.4	2.	.72	156.0	0.	.81	153.2	-3.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.
	-0.98	0.1	328.9	-3.	.30	328.9	-3.	.40	328.9	-3.	.51	323.0	-2.	.60	312.4	-1.	.70	300.7	-2.	.79	287.7	-3.
		0.25	248.9	-4.	.30	248.9	-4.	.40	248.9	-4.	.50	248.9	-4.	.60	248.9	-4.	.70	248.9	-4.	.80	248.9	-4.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.9	-4.	.50	171.9	-4.	.60	171.9	-4.	.70	171.9	-4.	.80	171.9	-4.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	95.3	-0.	.80	96.3	-0.
30.	1.0	0.1	210.7	-2.	.33	188.4	-1.	.44	181.2	-1.	.54	174.2	-2.	.60	170.6	-2.	.69	164.8	-2.	.79	158.4	-4.
		0.25	154.4	-6.	.31	143.9	-5.	.41	140.4	-5.	.50	137.1	-5.	.60	133.7	-4.	.70	129.9	-5.	.79	126.2	-8.
		0.5	110.4	-5.	.30	104.3	-2.	.40	102.3	-2.	.50	100.3	-2.	.60	98.1	-2.	.72	95.6	-4.	.80	93.7	-8.
		1.0	66.8	-1.	.30	64.4	-1.	.40	63.6	-1.	.51	62.8	-1.	.60	62.0	-2.	.69	61.2	-2.	.78	60.3	-4.
	0.0	0.1	233.0	2.	.31	207.1	7.	.42	198.4	6.	.50	191.6	6.	.60	184.0	5.	.69	177.0	4.	.81	168.3	2.
		0.25	180.9	3.	.30	166.7	3.	.42	161.5	3.	.49	157.9	3.	.60	153.1	2.	.69	148.8	1.	.80	143.4	-2.
		0.5	141.1	-2.	.30	133.0	0.	.40	130.2	1.	.50	127.0	1.	.59	124.2	1.	.72	120.0	0.	.79	117.4	-3.
		1.0	96.3	-4.	.30	92.7	-1.	.40	91.2	-1.	.49	89.8	-1.	.60	88.0	-1.	.70	86.3	-2.	.80	84.5	-5.
	-0.98	0.1	265.4	9.	.30	231.4	16.	.40	220.8	17.	.50	211.0	18.	.59	202.0	19.	.71	191.1	18.	.81	181.5	16.
		0.25	223.8	6.	.30	201.6	15.	.40	194.8	16.	.49	188.4	17.	.60	181.4	18.	.71	173.3	16.	.81	166.3	14.
		0.5	171.9	-4.	.30	171.9	-4.	.40	171.8	-4.	.50	166.9	-1.	.60	161.9	2.	.69	157.3	5.	.80	151.6	6.
		1.0	96.3	-0.	.30	96.3	-0.	.40	96.3	-0.	.50	96.3	-0.	.60	96.3	-0.	.70	96.3	-0.	.80	96.3	-0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 12

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	439.5	-6.	.30	432.5	-5.	.40	429.7	-4.	.50	426.5	-3.	.60	423.1	-3.	.70	419.0	-5.	.80	414.1	-8.
		0.25	310.3	-3.	.30	303.0	-1.	.40	300.2	0.	.50	297.1	1.	.60	293.8	2.	.69	290.2	4.	.81	285.5	3.
		0.5	205.8	-1.	.30	200.2	2.	.40	198.1	3.	.50	195.8	4.	.60	193.2	5.	.71	190.0	5.	.80	187.0	4.
		1.0	97.3	1.	.30	95.7	2.	.40	95.1	2.	.50	94.3	2.	.60	93.6	3.	.70	92.7	3.	.79	91.9	3.
	0.0	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	460.0	-4.	.69	460.0	-4.	.81	460.0	-8.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	339.1	-4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
	-0.98	0.1	460.0	-4.	.30	460.0	-4.	.40	460.0	-4.	.50	460.0	-4.	.60	460.0	-4.	.70	460.0	-4.	.80	460.0	-4.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	339.1	-4.	.70	339.1	-4.	.80	339.1	-4.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
20.	1.0	0.1	368.9	-7.	.31	340.6	-2.	.40	332.3	-2.	.50	322.4	-2.	.60	311.6	-2.	.71	300.4	-3.	.81	289.4	-6.
		0.25	248.2	-2.	.30	233.1	2.	.39	228.1	3.	.49	222.9	4.	.60	216.5	4.	.70	210.9	3.	.82	203.5	1.
		0.5	159.5	3.	.31	150.2	7.	.41	147.1	7.	.53	143.5	7.	.60	141.1	7.	.70	137.7	6.	.81	133.8	4.
		1.0	82.8	2.	.31	80.1	4.	.41	79.1	4.	.51	78.2	3.	.60	77.2	4.	.70	76.1	4.	.80	74.9	3.
	0.0	0.1	418.7	-7.	.31	386.5	-0.	.40	375.4	0.	.49	364.3	1.	.61	349.5	0.	.71	335.5	-1.	.80	322.9	-3.
		0.25	303.1	1.	.30	281.1	7.	.40	274.1	7.	.49	267.5	8.	.60	258.7	8.	.71	249.9	7.	.80	241.6	6.
		0.5	219.8	-1.	.30	207.5	5.	.40	202.5	7.	.49	197.7	9.	.61	191.5	10.	.71	185.8	9.	.80	180.6	8.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
	-0.98	0.1	460.0	-4.	.30	458.3	-3.	.40	443.3	-0.	.50	426.7	4.	.59	410.1	7.	.71	388.2	8.	.80	371.3	7.
		0.25	339.1	-4.	.30	339.1	-4.	.40	339.1	-4.	.50	339.1	-4.	.60	329.2	-1.	.70	315.9	3.	.80	302.2	8.
		0.5	226.0	-3.	.30	226.0	-3.	.40	226.0	-3.	.50	226.0	-3.	.60	226.0	-3.	.70	226.0	-3.	.80	226.0	-3.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.
30.	1.0	0.1	268.4	-1.	.33	234.1	2.	.44	223.5	2.	.56	213.4	2.	.60	209.7	2.	.68	202.5	2.	.79	192.4	1.
		0.25	185.1	-2.	.31	167.5	1.	.40	162.2	2.	.51	156.9	3.	.60	152.0	4.	.71	146.5	4.	.81	141.3	2.
		0.5	122.2	2.	.31	113.9	3.	.41	111.3	4.	.51	108.7	4.	.59	106.6	4.	.71	103.6	3.	.81	100.8	1.
		1.0	70.2	-0.	.31	67.4	2.	.41	66.4	2.	.52	65.4	2.	.60	64.6	1.	.70	63.7	1.	.80	62.6	1.
	0.0	0.1	296.0	5.	.33	254.7	12.	.41	244.8	12.	.50	235.7	12.	.60	224.9	11.	.71	214.6	11.	.80	205.7	9.
		0.25	218.6	9.	.30	196.7	10.	.41	189.1	10.	.49	183.7	10.	.60	176.3	11.	.70	169.6	11.	.80	163.4	10.
		0.5	160.7	8.	.32	147.3	11.	.41	143.5	11.	.50	139.3	12.	.60	135.8	12.	.70	131.8	12.	.80	127.6	10.
		1.0	104.8	-2.	.31	98.9	2.	.39	97.4	2.	.48	95.7	2.	.59	93.4	3.	.70	91.4	3.	.79	89.4	3.
	-0.98	0.1	333.8	14.	.29	284.9	23.	.40	269.5	25.	.50	256.7	27.	.59	244.8	29.	.72	229.2	29.	.80	220.8	28.
		0.25	265.4	18.	.30	233.8	27.	.40	224.5	28.	.49	216.6	30.	.60	206.7	30.	.71	197.6	30.	.80	190.0	29.
		0.5	220.8	-0.	.30	199.6	9.	.40	192.7	12.	.50	185.9	16.	.60	179.2	19.	.69	173.3	21.	.80	166.0	24.
		1.0	106.2	-0.	.30	106.2	-0.	.40	106.2	-0.	.50	106.2	-0.	.60	106.2	-0.	.70	106.2	-0.	.80	106.2	-0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 13

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	232.2	-6.	.30	226.5	-3.	.40	224.4	-2.	.51	222.0	-3.	.61	219.5	-6.	.76	217.4	-10.	.78	215.1	-16.
		0.25	144.8	-1.	.30	138.1	3.	.40	135.9	5.	.51	133.2	5.	.63	130.4	4.	.73	127.7	3.	.78	126.5	0.
		0.5	75.4	6.	.30	71.2	12.	.40	69.7	12.	.53	67.9	11.	.66	66.1	11.	.72	65.1	10.	.80	64.0	7.
		1.0	30.1	2.	.31	29.3	3.	.41	29.0	3.	.52	28.6	4.	.63	28.3	3.	.75	27.9	3.	.80	27.7	4.
	0.0	0.1	247.9	-5.	.30	247.9	-5.	.40	247.9	-5.	.50	247.9	-5.	.60	247.9	-5.	.69	247.8	-7.	.81	244.9	-17.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	170.3	-4.	.70	166.7	-2.	.80	162.[illegible]	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.82	97.4	-8.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
	-0.98	0.1	247.9	-5.	.30	247.9	-5.	.40	247.9	-5.	.50	247.9	-5.	.60	247.9	-5.	.70	247.9	-5.	.80	247.9	-5.
		0.25	171.2	-5.	.30	171.2	-5.	.40	171.2	-5.	.50	171.2	-5.	.60	171.2	-5.	.70	171.2	-5.	.80	171.2	-5.
		0.5	97.4	-1.	.30	97.4	-1.	.40	97.4	-1.	.50	97.4	-1.	.60	97.4	-1.	.70	97.4	-1.	.80	97.4	-1.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
20.	1.0	0.1	169.7	-2.	.32	147.3	7.	.45	138.8	5.	.45	138.8	5.	.64	127.7	1.	.64	127.7	1.	.79	119.7	-5.
		0.25	93.7	1.	.31	80.9	11.	.44	76.7	12.	.52	73.9	12.	.59	72.0	12.	.68	69.2	11.	.79	66.0	9.
		0.5	43.5	8.	.32	43.6	13.	.43	42.1	13.	.56	40.4	14.	.56	40.4	14.	.73	38.4	13.	.79	37.6	13.
		1.0	23.6	7.	.31	22.3	7.	.42	21.9	8.	.55	21.4	7.	.55	21.4	7.	.68	20.8	8.	.80	21.3	8.
	0.0	0.1	195.3	2.	.30	168.0	15.	.41	159.4	15.	.51	151.8	15.	.60	145.5	13.	.69	139.7	10.	.79	132.6	6.
		0.25	116.7	17.	.32	100.1	25.	.42	95.0	25.	.49	91.7	25.	.61	86.4	24.	.71	82.5	23.	.79	79.3	21.
		0.5	68.9	21.	.31	60.2	28.	.41	57.8	29.	.50	55.8	29.	.60	53.5	29.	.70	51.3	28.	.80	49.2	26.
		1.0	34.4	-0.	.30	33.9	1.	.40	32.9	4.	.50	32.1	6.	.60	31.1	9.	.72	30.1	10.	.80	29.3	11.
	-0.98	0.1	233.7	1.	.30	196.2	17.	.40	185.0	22.	.50	174.4	26.	.60	164.6	29.	.69	156.8	28.	.81	147.0	25.
		0.25	150.9	7.	.30	125.9	23.	.40	119.0	27.	.50	112.6	31.	.60	106.7	35.	.70	101.2	33.	.80	95.4	38.
		0.5	97.4	-1.	.30	86.6	10.	.40	82.2	15.	.50	78.0	19.	.60	74.1	23.	.70	70.5	27.	.80	66.9	31.
		1.0	34.4	-0.	.30	34.4	-0.	.40	34.4	-0.	.50	34.4	-0.	.60	34.4	-0.	.70	34.4	-0.	.80	34.4	-0.
30.	1.0	0.1	103.6	3.	.37	81.8	5.	.37	81.8	5.	.49	76.7	2.	.61	72.0	-1.	.75	66.9	-5.	.80	65.1	-6.
		0.25	57.0	-4.	.33	48.2	4.	.46	45.3	5.	.46	45.3	5.	.61	42.5	6.	.68	41.3	6.	.80	39.4	5.
		0.5	33.2	5.	.33	29.5	8.	.45	28.3	9.	.45	28.3	9.	.59	27.0	8.	.75	25.7	8.	.80	25.3	5.
		1.0	18.6	6.	.32	17.3	6.	.44	16.9	6.	.44	16.9	6.	.57	16.4	6.	.69	16.0	6.	.82	15.6	5.
	0.0	0.1	113.0	17.	.32	90.9	28.	.42	85.6	27.	.51	81.4	26.	.61	76.8	24.	.72	72.7	21.	.79	69.9	19.
		0.25	67.3	[illegible]	.28	57.0	23.	.38	54.3	22.	.51	50.9	22.	.59	48.9	22.	.70	40.5	21.	.80	44.4	20.
		0.5	42.5	[illegible]	[illegible]	37.2	24.	.43	35.3	25.	.50	34.3	25.	.60	32.9	25.	.69	31.8	25.	.79	30.6	24.
		1.0	25.9	[illegible]	[illegible]	23.5	18.	.40	23.0	18.	.50	22.4	18.	.59	21.8	19.	.71	21.1	18.	.80	20.5	18.
	-0.98	0.1	124.2	29.	[illegible]	99.9	43.	.40	93.6	47.	.50	88.0	50.	.60	83.0	53.	.73	77.3	51.	.81	73.8	49.
		0.25	[illegible]	[illegible]	.30	65.8	57.	.41	61.8	58.	.50	58.8	58.	.61	55.5	53.	.72	52.5	56.	.80	50.5	55.
		0.5	55.6	42.	.30	47.3	51.	.40	45.0	53.	.50	43.0	54.	.59	41.2	54.	.68	39.6	54.	.81	37.4	52.
		1.0	34.4	-0.	.30	34.4	-0.	.40	33.3	3.	.50	32.0	7.	.60	30.8	10.	.70	29.6	14.	.80	28.5	17.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 1

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR
10.	1.0	0.1	358.2	-7.	.30	349.3	-4.	.40	346.1	-3.	.50	342.8	-2.	.62	338.7	-3.	.78	332.7	-10.	.80	331.6	-12.
		0.25	213.1	-1.	.30	202.2	4.	.40	198.6	6.	.50	194.7	7.	.62	190.4	7.	.77	184.9	4.	.81	183.1	2.
		0.5	95.1	2.	.30	89.4	8.	.41	87.5	8.	.53	85.5	8.	.65	83.3	7.	.77	81.0	6.	.80	80.7	6.
		1.0	34.0	-2.	.31	33.1	-1.	.41	32.8	-2.	.52	32.4	-1.	.63	32.0	-2.	.73	31.7	-1.	.83	31.3	-2.
	0.0	0.1	382.8	-5.	.30	382.8	-5.	.40	382.8	-5.	.50	382.8	-5.	.60	382.8	-5.	.69	382.8	-5.	.80	380.6	-9.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	255.5	-4.	.70	249.9	-2.	.80	244.2	0.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
	-0.98	0.1	382.8	-5.	.30	382.8	-5.	.40	382.8	-5.	.50	382.8	-5.	.60	382.8	-5.	.70	382.8	-5.	.80	382.8	-5.
		0.25	256.4	-5.	.30	256.4	-5.	.40	256.4	-5.	.50	256.4	-5.	.60	256.4	-5.	.70	256.4	-5.	.80	256.4	-5.
		0.5	125.2	-1.	.30	125.2	-1.	.40	125.2	-1.	.50	125.2	-1.	.60	125.2	-1.	.70	125.2	-1.	.80	125.2	-1.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
20.	1.0	0.1	258.8	-2.	.31	224.3	10.	.44	211.4	10.	.44	211.4	10.	.59	197.1	8.	.72	185.3	4.	.84	176.7	-2.
		0.25	130.5	0.	.32	111.3	10.	.44	105.4	11.	.58	98.8	13.	.58	98.8	13.	.67	95.3	12.	.82	89.4	10.
		0.5	60.5	4.	.32	54.0	8.	.44	52.0	8.	.58	49.8	9.	.54	48.9	9.	.73	47.4	9.	.80	46.4	3.
		1.0	27.0	2.	.32	25.5	2.	.43	24.9	3.	.54	24.4	3.	.57	23.8	4.	.72	23.6	4.	.79	23.3	3.
	0.0	0.1	300.4	2.	.30	257.0	16.	.40	245.0	19.	.51	231.2	19.	.62	218.8	17.	.72	208.4	14.	.81	200.2	11.
		0.25	168.9	20.	.30	142.8	30.	.41	134.6	31.	.50	129.4	31.	.60	122.0	31.	.71	115.9	30.	.79	111.3	28.
		0.5	90.2	20.	.31	77.7	28.	.40	74.6	29.	.50	71.5	30.	.60	68.7	30.	.70	65.8	29.	.80	63.3	28.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	37.6	0.	.60	36.4	2.	.72	35.2	4.	.79	34.4	6.
	-0.98	0.1	361.8	1.	.30	302.1	17.	.40	284.5	22.	.50	268.3	26.	.59	254.7	30.	.73	236.3	32.	.79	228.1	31.
		0.25	221.7	10.	.30	182.2	26.	.40	171.7	30.	.50	162.2	34.	.60	153.2	37.	.70	144.9	41.	.80	137.2	44.
		0.5	125.2	-1.	.30	115.9	7.	.40	109.5	12.	.50	103.7	17.	.60	98.3	21.	.70	93.3	25.	.80	88.6	29.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	38.3	-1.	.60	38.3	-1.	.70	38.3	-1.	.80	38.3	-1.
30.	1.0	0.1	154.5	6.	.35	122.0	15.	.35	122.0	15.	.52	110.3	12.	.62	105.0	10.	.73	99.0	7.	.81	95.0	5.
		0.25	77.6	-8.	.35	64.1	-3.	.35	64.1	-3.	.49	59.9	-2.	.54	56.1	1.	.72	54.2	1.	.80	52.3	0.
		0.5	41.2	-0.	.34	36.1	2.	.46	34.5	3.	.46	34.5	3.	.59	33.0	4.	.74	31.4	5.	.81	30.7	4.
		1.0	21.4	2.	.32	19.8	2.	.44	19.2	3.	.44	19.2	3.	.57	18.7	3.	.69	18.2	3.	.80	17.8	4.
	0.0	0.1	170.4	19.	.31	136.7	33.	.42	127.2	34.	.51	120.8	33.	.61	113.7	32.	.72	107.5	31.	.81	102.6	29.
		0.25	93.7	30.	.30	77.5	31.	.40	73.4	31.	.51	69.5	30.	.61	66.0	28.	.70	63.3	27.	.80	60.4	25.
		0.5	54.3	20.	.32	46.4	23.	.41	44.6	24.	.50	42.9	25.	.60	41.2	25.	.70	39.6	25.	.80	38.0	25.
		1.0	30.5	11.	.31	27.4	14.	.40	26.7	15.	.50	25.9	15.	.59	25.2	16.	.69	24.4	17.	.81	23.6	17.
	-0.98	0.1	188.7	30.	.30	150.0	45.	.40	140.3	48.	.50	131.7	51.	.59	124.7	54.	.73	115.1	55.	.81	110.2	54.
		0.25	113.3	51.	.30	91.9	60.	.40	86.7	62.	.51	81.3	63.	.60	77.2	63.	.71	72.8	62.	.80	69.7	61.
		0.5	73.3	41.	.30	61.1	51.	.40	57.9	53.	.51	54.9	55.	.60	52.4	56.	.69	50.3	56.	.80	47.7	56.
		1.0	38.3	-1.	.30	38.3	-1.	.40	38.3	-1.	.50	37.8	-0.	.60	36.3	4.	.70	34.8	8.	.80	33.4	12.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 15

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	239.5	-6.	.30	234.7	-4.	.40	232.8	-3.	.50	230.8	-2.	.63	228.1	-5.	.73	225.6	-11.	.82	223.3	-18.
		0.25	159.5	-2.	.30	153.5	2.	.40	151.3	4.	.50	149.0	5.	.61	146.6	5.	.69	144.5	4.	.81	141.3	-4.
		0.5	91.9	5.	.30	87.7	9.	.40	86.2	10.	.52	84.4	10.	.64	82.4	9.	.79	79.8	5.	.83	73.0	3.
		1.0	37.9	-0.	.30	36.9	2.	.40	36.6	3.	.50	36.2	4.	.60	35.8	5.	.71	35.3	5.	.80	34.9	6.
	0.0	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.50	253.3	-5.	.72	253.3	-9.	.79	252.3	-15.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	182.6	-5.	.79	179.2	-9.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.50	112.9	-3.	.70	112.9	-3.	.80	112.9	-7.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
	-0.98	0.1	253.3	-5.	.30	253.3	-5.	.40	253.3	-5.	.50	253.3	-5.	.60	253.3	-5.	.70	253.3	-5.	.80	253.3	-5.
		0.25	182.6	-5.	.30	182.6	-5.	.40	182.6	-5.	.50	182.6	-5.	.60	182.6	-5.	.70	182.6	-5.	.80	182.6	-5.
		0.5	112.9	-3.	.30	112.9	-3.	.40	112.9	-3.	.50	112.9	-3.	.60	112.9	-3.	.70	112.9	-3.	.80	112.9	-3.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
20.	1.0	0.1	185.2	-1.	.32	163.8	5.	.45	155.5	5.	.53	150.5	4.	.62	144.8	2.	.75	137.0	-2.	.81	133.6	-4.
		0.25	111.6	5.	.32	98.5	11.	.44	93.8	12.	.57	89.2	13.	.57	89.2	13.	.77	82.3	10.	.80	81.3	9.
		0.5	62.3	9.	.31	56.9	13.	.43	54.9	14.	.57	52.8	13.	.57	52.8	13.	.71	50.6	13.	.79	49.3	12.
		1.0	30.2	3.	.31	28.8	7.	.41	28.3	8.	.52	27.8	9.	.63	27.3	9.	.69	27.0	9.	.81	26.3	9.
	0.0	0.1	211.4	-0.	.30	186.2	10.	.41	177.5	11.	.50	170.7	12.	.63	160.7	9.	.72	153.6	6.	.80	147.9	3.
		0.25	136.8	14.	.30	121.1	20.	.41	115.9	21.	.50	111.6	21.	.60	106.3	21.	.71	101.5	19.	.80	97.3	18.
		0.5	88.0	16.	.30	78.6	23.	.41	75.7	24.	.49	73.3	25.	.61	70.2	25.	.70	67.8	23.	.81	64.9	21.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	42.2	2.	.69	41.1	4.	.80	39.9	7.
	-0.98	0.1	251.2	-4.	.30	217.9	10.	.40	206.7	15.	.50	195.8	19.	.60	185.3	22.	.69	176.4	22.	.81	164.8	19.
		0.25	177.4	-2.	.30	151.9	13.	.40	144.4	17.	.50	137.3	21.	.60	130.5	25.	.70	123.9	29.	.81	117.0	29.
		0.5	112.9	-3.	.30	112.9	-3.	.40	108.2	1.	.50	103.2	6.	.60	98.4	10.	.70	93.3	14.	.81	88.7	16.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	43.1	-0.
30.	1.0	0.1	119.1	2.	.33	98.1	12.	.33	93.1	12.	.49	90.5	10.	.58	86.3	9.	.69	81.5	7.	.80	77.5	7.
		0.25	71.3	2.	.32	61.5	10.	.45	58.3	10.	.45	58.3	10.	.60	55.0	11.	.60	55.0	11.	.83	50.1	10.
		0.5	43.6	5.	.32	39.3	10.	.44	39.0	11.	.56	36.6	11.	.56	36.6	11.	.70	35.1	11.	.81	33.8	10.
		1.0	24.3	3.	.31	23.0	5.	.42	22.5	5.	.53	22.1	6.	.65	21.6	6.	.77	21.1	7.	.81	20.9	7.
	0.0	0.1	129.6	14.	.29	108.4	27.	.42	100.9	26.	.50	96.2	25.	.61	90.7	24.	.70	86.9	22.	.81	81.8	23.
		0.25	83.8	21.	.27	73.1	27.	.41	68.5	26.	.50	65.5	25.	.58	63.2	25.	.69	60.4	24.	.78	55.0	24.
		0.5	56.5	20.	.30	50.2	25.	.41	48.2	25.	.50	46.7	25.	.60	45.0	25.	.69	43.6	25.	.81	41.7	23.
		1.0	35.4	8.	.28	32.8	13.	.40	31.9	14.	.49	31.1	15.	.60	30.2	16.	.69	29.5	16.	.79	28.7	16.
	-0.98	0.1	142.6	24.	.30	116.6	38.	.40	109.7	41.	.49	104.0	44.	.59	98.1	47.	.69	93.0	46.	.81	87.5	44.
		0.25	99.4	41.	.30	83.6	50.	.40	79.3	51.	.50	75.7	52.	.60	71.9	52.	.71	68.2	51.	.80	65.4	49.
		0.5	74.7	32.	.30	64.9	41.	.40	62.1	43.	.50	59.4	46.	.61	56.8	47.	.69	54.7	47.	.80	52.3	45.
		1.0	43.1	-0.	.30	43.1	-0.	.40	43.1	-0.	.50	43.1	-0.	.60	43.1	-0.	.70	43.1	-0.	.80	41.9	3.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 16

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR
10.	1.0	0.1	365.8	-7.	.30	357.8	-4.	.40	354.9	-3.	.50	351.7	-3.	.60	348.3	-2.	.75	343.0	-7.	.81	340.8	-10.
		0.25	230.8	-0.	.30	220.7	4.	.40	217.2	6.	.50	213.6	7.	.60	209.9	8.	.77	203.6	5.	.80	202.3	4.
		0.5	114.1	4.	.30	107.9	8.	.41	105.7	8.	.53	103.3	9.	.65	100.8	8.	.65	100.8	8.	.78	97.7	3.
		1.0	40.3	-2.	.30	39.3	1.	.40	39.0	1.	.50	38.6	2.	.61	38.2	3.	.78	37.5	4.	.79	37.4	4.
	0.0	0.1	388.0	-5.	.30	388.0	-5.	.40	388.0	-5.	.50	388.0	-5.	.60	388.0	-5.	.69	388.0	-5.	.80	387.3	-4.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	268.1	-4.	.80	262.4	-2.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
	-0.98	0.1	388.0	-5.	.30	388.0	-5.	.40	388.0	-5.	.50	388.0	-5.	.60	388.0	-5.	.70	388.0	-5.	.80	388.0	-5.
		0.25	270.1	-5.	.30	270.1	-5.	.40	270.1	-5.	.50	270.1	-5.	.60	270.1	-5.	.70	270.1	-5.	.80	270.1	-5.
		0.5	145.6	-2.	.30	145.6	-2.	.40	145.6	-2.	.50	145.6	-2.	.60	145.6	-2.	.70	145.6	-2.	.80	145.6	-2.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
20.	1.0	0.1	275.4	-1.	.31	241.5	9.	.43	229.2	9.	.43	229.2	9.	.58	215.4	8.	.67	207.8	6.	.78	197.8	2.
		0.25	149.9	6.	.32	129.9	14.	.44	123.3	15.	.44	123.3	15.	.58	116.5	16.	.76	107.8	14.	.82	105.3	13.
		0.5	74.1	6.	.31	66.9	11.	.43	64.5	13.	.55	62.1	14.	.55	62.1	14.	.68	59.5	14.	.61	57.1	13.
		1.0	32.5	2.	.31	30.9	5.	.41	30.4	5.	.52	29.8	6.	.63	29.3	7.	.74	26.7	7.	.78	26.4	8.
	0.0	0.1	317.3	-0.	.30	276.2	13.	.40	263.7	15.	.50	251.2	16.	.62	237.3	15.	.70	229.0	13.	.81	217.2	9.
		0.25	191.2	18.	.31	163.7	27.	.40	156.5	28.	.50	149.4	29.	.61	142.1	29.	.71	135.4	28.	.80	129.8	27.
		0.5	110.1	19.	.31	96.4	27.	.40	92.9	28.	.50	89.4	28.	.60	85.9	29.	.71	82.1	29.	.81	78.8	28.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	44.0	3.
	-0.98	0.1	380.0	-3.	.30	324.3	12.	.40	306.6	17.	.50	289.9	22.	.59	275.8	25.	.72	256.9	28.	.80	246.0	27.
		0.25	249.8	3.	.30	209.4	19.	.40	198.2	23.	.50	187.8	27.	.60	177.8	31.	.70	168.4	35.	.80	159.5	38.
		0.5	145.6	-2.	.30	143.6	-1.	.40	136.3	4.	.50	129.5	9.	.60	123.1	14.	.70	117.0	18.	.80	111.2	22.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.
30.	1.0	0.1	170.5	5.	.33	139.5	16.	.47	127.6	16.	.47	127.6	16.	.67	115.3	15.	.74	111.3	14.	.82	106.8	12.
		0.25	92.1	-1.	.33	77.9	7.	.45	73.7	9.	.45	73.7	9.	.55	67.4	12.	.75	64.8	12.	.81	63.1	12.
		0.5	50.9	2.	.32	45.4	6.	.45	43.5	7.	.45	43.5	7.	.57	41.9	9.	.70	40.2	10.	.79	39.0	10.
		1.0	26.2	1.	.31	24.6	4.	.42	24.2	4.	.54	23.6	5.	.65	23.1	6.	.77	22.5	6.	.79	22.4	7.
	0.0	0.1	157.7	16.	.30	153.1	31.	.41	142.9	32.	.51	135.5	32.	.61	128.2	31.	.71	121.3	30.	.81	115.1	28.
		0.25	110.5	27.	.30	93.2	32.	.41	87.8	33.	.50	84.2	33.	.60	80.1	32.	.71	76.4	32.	.81	72.8	31.
		0.5	68.0	22.	.30	59.5	26.	.40	57.1	28.	.50	55.0	28.	.59	53.0	29.	.71	50.7	29.	.80	48.9	29.
		1.0	39.1	6.	.31	35.7	11.	.40	34.9	12.	.49	34.0	13.	.59	33.1	15.	.69	32.2	16.	.80	31.2	17.
	-0.98	0.1	207.4	27.	.30	166.9	41.	.40	156.5	45.	.50	147.2	48.	.60	138.8	51.	.68	132.5	52.	.81	123.7	50.
		0.25	133.2	47.	.30	109.9	56.	.40	104.0	58.	.50	98.5	59.	.60	93.4	59.	.70	88.9	59.	.81	84.0	57.
		0.5	92.5	35.	.30	78.7	45.	.40	75.0	47.	.50	71.4	50.	.60	68.2	52.	.73	64.4	52.	.61	62.2	52.
		1.0	45.3	-0.	.30	45.3	-0.	.40	45.3	-0.	.50	45.3	-0.	.60	45.3	-0.	.70	45.3	-0.	.80	45.3	-0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 17

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	292.9	-4.	.30	285.6	-1.	.40	282.7	-0.	.50	279.7	-1.	.60	276.3	-2.	.70	272.4	-5.	.79	268.5	-10.
		0.25	195.0	0.	.30	187.6	4.	.40	185.0	5.	.50	182.2	6.	.59	179.2	6.	.70	175.7	5.	.78	172.9	1.
		0.5	122.8	2.	.30	118.6	5.	.40	117.1	6.	.50	115.5	8.	.60	113.8	9.	.70	112.0	10.	.80	109.9	8.
		1.0	63.0	5.	.30	61.3	8.	.40	60.7	9.	.49	60.1	10.	.59	59.4	10.	.71	58.5	10.	.79	57.7	8.
	0.0	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	312.3	-2.	.72	308.2	-5.	.81	304.6	-11.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	221.0	-3.	.81	215.2	-5.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
	-0.98	0.1	313.2	-3.	.30	313.2	-3.	.40	313.2	-3.	.50	313.2	-3.	.60	313.2	-3.	.70	313.2	-3.	.80	313.2	-3.
		0.25	224.4	-4.	.30	224.4	-4.	.40	224.4	-4.	.50	224.4	-4.	.60	224.4	-4.	.70	224.4	-4.	.80	224.4	-4.
		0.5	143.1	-4.	.30	143.1	-4.	.40	143.1	-4.	.50	143.1	-4.	.60	143.1	-4.	.70	143.1	-4.	.80	143.1	-4.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
20.	1.0	0.1	218.2	1.	.30	193.5	9.	.40	185.9	9.	.49	178.7	8.	.59	171.7	8.	.69	163.8	7.	.79	156.6	5.
		0.25	137.9	5.	.30	125.0	11.	.39	121.1	12.	.50	117.0	12.	.60	113.0	12.	.70	109.1	13.	.81	104.7	11.
		0.5	89.3	8.	.30	82.2	15.	.39	80.1	16.	.48	77.9	16.	.59	75.5	16.	.69	73.2	16.	.78	71.0	14.
		1.0	49.5	7.	.29	47.2	12.	.39	46.5	12.	.49	45.6	12.	.59	44.7	13.	.71	43.7	13.	.80	42.8	12.
	0.0	0.1	248.2	5.	.30	216.7	16.	.40	206.8	16.	.51	197.1	16.	.61	187.9	16.	.72	177.3	14.	.80	170.7	12.
		0.25	166.3	14.	.31	147.7	20.	.41	142.5	20.	.50	137.5	21.	.60	131.9	21.	.71	125.9	20.	.81	120.4	19.
		0.5	116.3	11.	.30	106.4	19.	.40	103.3	20.	.49	100.4	21.	.60	96.8	22.	.70	93.1	22.	.80	89.6	21.
		1.0	72.4	1.	.30	68.9	6.	.40	67.2	9.	.50	65.6	11.	.60	63.9	13.	.72	61.8	14.	.81	60.2	13.
	-0.98	0.1	294.5	3.	.30	251.1	18.	.40	237.5	22.	.50	224.3	26.	.61	211.1	29.	.73	197.3	29.	.80	189.0	27.
		0.25	213.7	1.	.30	184.5	14.	.40	175.7	18.	.50	167.2	22.	.60	159.1	26.	.70	151.2	30.	.80	143.6	31.
		0.5	143.1	-4.	.30	143.1	-4.	.40	138.9	-1.	.50	133.1	4.	.60	127.4	8.	.70	121.8	12.	.80	116.2	16.
		1.0	72.4	1.	.30	72.4	1.	.40	72.4	1.	.50	72.4	1.	.60	72.4	1.	.70	72.4	1.	.80	72.4	1.
30.	1.0	0.1	139.5	-3.	.30	118.7	6.	.39	113.9	7.	.47	109.0	8.	.61	102.4	9.	.70	97.9	9.	.80	93.1	9.
		0.25	93.1	-0.	.30	82.1	10.	.38	79.3	11.	.48	76.2	12.	.57	73.6	12.	.69	70.2	13.	.81	67.1	13.
		0.5	62.8	6.	.29	57.6	12.	.39	55.9	13.	.48	54.4	14.	.57	53.0	14.	.71	50.8	13.	.81	49.2	12.
		1.0	39.3	5.	.30	37.2	8.	.40	36.4	9.	.49	35.8	9.	.58	35.1	9.	.68	34.4	9.	.81	33.5	8.
	0.0	0.1	150.8	11.	.31	126.1	24.	.42	119.0	23.	.50	113.9	23.	.60	108.4	21.	.71	102.9	20.	.79	98.5	19.
		0.25	106.0	12.	.32	91.9	19.	.41	88.2	20.	.49	85.1	21.	.61	80.8	22.	.71	77.5	22.	.80	74.5	22.
		0.5	77.6	15.	.31	69.5	22.	.40	67.3	23.	.50	65.0	24.	.60	62.7	24.	.70	60.6	23.	.80	58.6	23.
		1.0	53.4	13.	.31	49.5	18.	.39	48.4	19.	.49	47.3	19.	.60	45.9	19.	.70	44.7	19.	.80	43.5	18.
	-0.98	0.1	164.4	25.	.30	135.9	38.	.40	128.3	41.	.50	121.3	45.	.60	115.0	47.	.70	109.1	50.	.81	102.6	48.
		0.25	122.5	39.	.30	105.0	48.	.40	100.3	49.	.51	95.1	50.	.60	91.0	50.	.71	86.6	49.	.80	82.9	48.
		0.5	98.5	29.	.30	86.6	37.	.40	83.1	40.	.50	79.7	42.	.61	76.3	44.	.70	73.5	44.	.80	70.5	43.
		1.0	72.4	1.	.30	71.0	3.	.40	68.6	7.	.50	66.3	10.	.60	64.0	13.	.70	61.8	16.	.80	59.6	19.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 18

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	417.7	-5.	.30	407.3	-3.	.40	403.4	-2.	.50	399.3	-1.	.60	394.9	-1.	.70	390.0	-4.	.81	384.2	-8.
		0.25	266.0	0.	.30	254.7	5.	.40	250.7	6.	.50	246.7	7.	.60	242.6	8.	.69	238.3	8.	.80	233.3	7.
		0.5	158.3	4.	.30	151.2	8.	.40	148.4	10.	.49	145.8	12.	.59	142.9	13.	.72	138.6	12.	.82	135.5	11.
		1.0	69.3	3.	.30	67.4	6.	.39	66.7	7.	.49	66.0	7.	.60	65.2	8.	.70	64.3	8.	.80	63.4	8.
	0.0	0.1	446.5	-4.	.30	446.5	-4.	.40	446.5	-4.	.50	446.5	-4.	.60	446.5	-4.	.70	444.2	-3.	.80	439.4	-7.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	305.2	-2.	.80	293.2	0.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
	-0.98	0.1	446.5	-4.	.30	446.5	-4.	.40	446.5	-4.	.50	446.5	-4.	.60	446.5	-4.	.70	446.5	-4.	.80	446.5	-4.
		0.25	310.7	-4.	.30	310.7	-4.	.40	310.7	-4.	.50	310.7	-4.	.60	310.7	-4.	.70	310.7	-4.	.80	310.7	-4.
		0.5	187.0	-2.	.30	187.0	-2.	.40	187.0	-2.	.50	187.0	-2.	.60	187.0	-2.	.70	187.0	-2.	.80	187.0	-2.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
20.	1.0	0.1	307.5	-1.	.30	270.8	10.	.40	259.5	10.	.50	248.8	10.	.60	238.7	9.	.69	228.8	8.	.80	218.7	5.
		0.25	181.0	4.	.30	162.6	11.	.39	157.1	12.	.49	151.0	14.	.58	145.6	15.	.69	139.0	16.	.79	133.0	15.
		0.5	104.5	9.	.29	95.5	16.	.39	92.6	17.	.48	90.1	18.	.58	87.4	18.	.71	84.0	18.	.79	81.8	17.
		1.0	54.2	7.	.30	51.5	10.	.40	50.5	11.	.49	49.7	11.	.60	48.7	11.	.69	47.7	12.	.79	46.8	12.
	0.0	0.1	352.9	3.	.30	306.1	16.	.40	291.8	18.	.51	277.1	18.	.61	264.3	18.	.72	250.5	16.	.80	240.5	14.
		0.25	221.1	16.	.31	193.2	24.	.40	185.6	25.	.50	178.4	25.	.60	170.6	26.	.70	163.8	25.	.80	156.6	24.
		0.5	144.1	16.	.30	127.8	26.	.40	123.2	27.	.49	118.7	28.	.61	113.6	29.	.70	109.4	29.	.80	105.2	28.
		1.0	79.6	1.	.30	76.5	4.	.40	74.5	7.	.50	72.5	9.	.60	70.5	12.	.70	68.5	14.	.80	66.4	15.
	-0.98	0.1	422.0	2.	.30	356.7	17.	.40	336.8	22.	.50	318.1	26.	.59	302.2	30.	.73	278.8	31.	.80	269.1	31.
		0.25	285.8	4.	.30	242.0	19.	.40	229.5	23.	.50	217.9	27.	.60	206.8	31.	.70	196.2	34.	.80	186.2	38.
		0.5	187.0	-2.	.30	177.7	3.	.40	169.7	8.	.50	162.1	12.	.60	154.7	16.	.70	147.2	20.	.80	139.9	24.
		1.0	79.6	1.	.30	79.6	1.	.40	79.6	1.	.50	79.6	1.	.60	79.6	1.	.70	79.6	1.	.80	79.6	1.
30.	1.0	0.1	192.1	-0.	.31	160.8	7.	.40	152.7	6.	.49	145.6	7.	.61	136.9	7.	.70	131.3	7.	.79	125.6	7.
		0.25	115.8	-2.	.29	100.6	8.	.38	96.7	10.	.46	93.7	11.	.63	87.1	14.	.71	84.2	14.	.81	81.1	14.
		0.5	72.3	7.	.30	65.4	12.	.39	63.6	12.	.48	61.8	14.	.59	59.5	14.	.69	57.7	14.	.79	55.9	14.
		1.0	42.7	6.	.30	40.2	9.	.39	39.5	9.	.49	38.6	9.	.60	37.8	10.	.71	36.9	10.	.81	36.1	10.
	0.0	0.1	209.0	14.	.31	172.5	28.	.41	162.3	29.	.51	154.3	28.	.60	146.4	28.	.71	138.6	26.	.79	132.7	25.
		0.25	134.4	18.	.30	114.6	22.	.41	108.6	23.	.50	104.4	24.	.59	99.8	25.	.69	95.6	26.	.80	90.9	25.
		0.5	90.7	19.	.31	80.0	25.	.40	77.3	26.	.50	74.5	27.	.60	71.9	28.	.70	69.2	28.	.80	66.5	28.
		1.0	58.8	15.	.31	54.0	19.	.40	52.7	20.	.49	51.4	20.	.60	49.9	21.	.69	48.6	21.	.81	47.1	21.
	-0.99	0.1	229.1	27.	.30	186.4	40.	.40	175.3	44.	.50	165.4	47.	.60	156.3	50.	.69	148.7	52.	.80	140.0	52.
		0.25	157.3	43.	.30	131.8	53.	.39	125.4	55.	.51	118.1	56.	.60	112.9	56.	.69	108.1	56.	.79	102.6	55.
		0.5	116.8	37.	.30	100.8	45.	.40	96.4	48.	.50	92.2	50.	.61	88.0	52.	.71	84.2	52.	.80	80.8	52.
		1.0	79.6	1.	.30	78.1	2.	.40	75.2	6.	.50	72.5	9.	.60	69.9	13.	.70	67.4	16.	.80	64.9	19.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 19

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR
10.	1.0	0.1	308.1	-4.	.30	302.5	-2.	.40	300.3	-1.	.50	297.8	-1.	.60	294.9	-2.	.69	291.8	-4.	.79	288.0	-10.
		0.25	220.3	-1.	.30	214.3	2.	.40	212.1	3.	.50	209.5	3.	.60	206.8	4.	.70	203.7	3.	.79	200.7	1.
		0.5	147.6	-0.	.30	144.2	2.	.40	142.8	3.	.50	141.4	4.	.60	139.8	5.	.69	138.2	6.	.79	136.2	5.
		1.0	82.7	3.	.30	81.0	5.	.40	80.4	5.	.51	79.6	5.	.62	78.7	6.	.71	77.9	5.	.81	76.9	4.
	0.0	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	324.0	-3.	.70	324.0	-5.	.81	326.8	-12.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.82	243.8	-7.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
	-0.98	0.1	324.0	-3.	.30	324.0	-3.	.40	324.0	-3.	.50	324.0	-3.	.60	324.0	-3.	.70	324.0	-3.	.80	324.0	-3.
		0.25	243.8	-4.	.30	243.8	-4.	.40	243.8	-4.	.50	243.8	-4.	.60	243.8	-4.	.70	243.8	-4.	.80	243.8	-4.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
20.	1.0	0.1	250.6	-1.	.30	229.0	5.	.39	221.7	5.	.49	214.2	5.	.59	207.0	5.	.70	197.6	4.	.79	190.1	2.
		0.25	170.3	3.	.30	158.4	7.	.40	154.5	7.	.49	150.5	7.	.59	146.4	9.	.70	141.7	7.	.79	137.7	6.
		0.5	113.1	2.	.30	111.5	8.	.39	109.3	8.	.49	106.7	9.	.58	104.2	9.	.70	101.0	9.	.80	98.2	6.
		1.0	67.8	5.	.30	65.3	8.	.40	64.3	7.	.51	63.2	8.	.61	62.2	7.	.70	61.3	7.	.80	60.1	5.
	0.0	0.1	292.8	0.	.31	256.4	8.	.40	247.3	8.	.50	238.3	9.	.60	228.0	9.	.71	217.0	7.	.80	207.9	5.
		0.25	205.5	7.	.30	188.8	13.	.40	182.9	13.	.49	177.9	13.	.60	171.5	13.	.70	165.4	12.	.80	159.3	10.
		0.5	150.9	3.	.30	141.5	9.	.39	138.5	11.	.49	135.1	12.	.60	131.5	13.	.69	128.0	13.	.80	124.1	11.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	90.6	2.	.69	88.7	4.	.79	86.4	3.
	-0.98	0.1	324.0	-3.	.30	300.1	5.	.40	287.4	9.	.50	274.0	13.	.60	260.2	16.	.72	244.5	16.	.80	233.0	15.
		0.25	243.8	-4.	.30	240.3	-2.	.40	231.1	2.	.50	221.9	6.	.60	212.5	10.	.70	203.0	14.	.81	192.1	15.
		0.5	164.3	-4.	.30	164.3	-4.	.40	164.3	-4.	.50	164.3	-4.	.60	164.3	-4.	.70	164.3	-4.	.80	164.3	-4.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.
30.	1.0	0.1	174.0	2.	.29	152.5	12.	.39	146.3	12.	.48	140.5	12.	.58	135.0	11.	.70	127.8	9.	.81	122.0	9.
		0.25	124.7	2.	.30	113.4	6.	.40	109.6	6.	.49	106.2	7.	.60	102.3	7.	.69	99.0	7.	.78	95.9	8.
		0.5	89.6	3.	.30	82.3	7.	.40	80.3	8.	.50	78.1	3.	.60	76.1	7.	.70	74.1	7.	.81	71.9	5.
		1.0	55.5	0.	.30	53.0	5.	.39	52.2	5.	.49	51.4	5.	.58	50.5	5.	.70	49.5	4.	.81	48.4	3.
	0.0	0.1	189.3	9.	.30	163.2	22.	.41	155.2	23.	.51	147.9	22.	.61	141.0	21.	.70	135.1	20.	.80	129.1	18.
		0.25	142.7	13.	.31	127.8	18.	.42	122.8	17.	.49	119.6	17.	.61	114.8	16.	.69	111.1	16.	.79	106.5	15.
		0.5	110.7	10.	.31	101.1	14.	.40	98.4	14.	.50	95.5	14.	.59	92.7	15.	.69	89.9	15.	.80	86.7	14.
		1.0	77.5	7.	.30	72.8	10.	.40	71.2	10.	.49	69.9	11.	.60	68.1	11.	.69	66.7	10.	.80	64.8	9.
	-0.98	0.1	208.9	18.	.30	176.7	30.	.40	167.7	34.	.49	160.2	37.	.61	150.7	39.	.71	142.7	39.	.80	136.8	38.
		0.25	168.5	27.	.30	147.7	36.	.40	141.9	37.	.50	136.1	38.	.59	130.7	38.	.70	125.0	38.	.79	119.3	37.
		0.5	142.4	10.	.30	128.4	19.	.40	124.0	22.	.50	119.7	24.	.60	115.5	27.	.69	111.6	29.	.80	106.9	29.
		1.0	92.2	-0.	.30	92.2	-0.	.40	92.2	-0.	.50	92.2	-0.	.60	92.2	-0.	.70	92.2	-0.	.80	92.2	-0.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 20

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	433.7	-5.	.30	425.5	-3.	.40	422.2	-2.	.50	418.5	-1.	.60	414.6	-1.	.70	410.3	-3.	.81	404.8	-7.
		0.25	296.4	-0.	.30	286.7	3.	.40	283.2	4.	.50	279.4	5.	.60	275.4	7.	.69	271.1	7.	.80	266.2	7.
		0.5	189.5	1.	.30	184.1	4.	.40	182.1	5.	.50	179.7	6.	.60	176.7	8.	.70	173.4	10.	.80	169.8	8.
		1.0	89.8	1.	.30	87.7	4.	.40	86.9	5.	.50	86.1	5.	.60	85.1	5.	.70	84.1	6.	.80	83.0	6.
	0.0	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.9	-3.	.69	457.9	-3.	.80	455.6	-7.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	333.2	-3.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
	-0.98	0.1	457.9	-3.	.30	457.9	-3.	.40	457.9	-3.	.50	457.9	-3.	.60	457.9	-3.	.70	457.9	-3.	.80	457.9	-3.
		0.25	334.2	-4.	.30	334.2	-4.	.40	334.2	-4.	.50	334.2	-4.	.60	334.2	-4.	.70	334.2	-4.	.80	334.2	-4.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	215.2	-2.	.70	215.2	-2.	.80	215.2	-2.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
20.	1.0	0.1	342.7	-1.	.31	308.1	7.	.40	298.1	7.	.49	287.2	7.	.59	276.5	7.	.70	264.8	6.	.81	252.3	4.
		0.25	213.4	9.	.30	200.3	9.	.40	194.6	10.	.50	188.8	11.	.59	183.5	12.	.70	176.4	12.	.80	169.6	12.
		0.5	137.0	9.	.30	126.8	13.	.41	123.4	14.	.51	120.0	14.	.62	116.3	14.	.70	113.4	14.	.80	110.0	13.
		1.0	72.2	3.	.30	69.0	7.	.39	68.0	9.	.49	67.0	9.	.59	65.7	9.	.70	64.4	9.	.80	63.2	13.
	0.0	0.1	390.1	-1.	.30	348.7	10.	.40	334.6	11.	.50	320.6	12.	.61	305.9	13.	.72	290.7	11.	.80	279.1	9.
		0.25	265.3	11.	.30	238.7	18.	.40	230.5	19.	.49	223.1	19.	.60	214.7	20.	.71	205.8	20.	.80	193.0	19.
		0.5	186.4	9.	.30	170.5	17.	.39	165.6	19.	.50	159.8	20.	.59	154.7	22.	.71	148.2	22.	.61	142.6	21.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	100.9	0.	.60	98.4	3.	.70	95.9	5.	.81	93.1	7.
	-0.98	0.1	457.9	-3.	.30	408.4	8.	.40	388.9	12.	.50	369.5	17.	.59	352.5	20.	.72	327.6	23.	.60	313.9	22.
		0.25	334.2	-4.	.30	302.9	6.	.40	289.4	10.	.50	276.2	14.	.60	263.4	18.	.70	250.8	22.	.80	238.4	26.
		0.5	215.2	-2.	.30	215.2	-2.	.40	215.2	-2.	.50	215.2	-2.	.60	210.6	-0.	.70	201.8	4.	.80	193.0	8.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	101.4	-0.
30.	1.0	0.1	225.3	1.	.30	196.4	13.	.39	188.5	14.	.48	180.4	14.	.57	172.3	13.	.70	162.1	13.	.80	154.7	13.
		0.25	150.0	3.	.30	132.8	10.	.40	127.8	11.	.49	123.3	12.	.60	118.5	13.	.70	113.8	13.	.80	109.8	14.
		0.5	98.5	5.	.29	90.7	11.	.39	88.3	11.	.49	85.8	12.	.58	83.5	12.	.70	80.7	12.	.81	78.1	11.
		1.0	58.2	1.	.30	55.3	5.	.40	54.3	6.	.50	53.3	6.	.59	52.4	7.	.70	51.3	8.	.80	50.4	9.
	0.0	0.1	248.6	11.	.30	210.8	24.	.40	200.5	27.	.51	189.5	27.	.61	180.2	26.	.71	171.2	25.	.80	163.3	24.
		0.25	174.5	16.	.31	151.3	23.	.41	145.3	24.	.50	139.6	24.	.60	134.2	24.	.69	128.9	24.	.80	123.1	24.
		0.5	125.1	17.	.31	112.3	21.	.40	109.0	22.	.50	105.6	23.	.60	102.1	23.	.70	98.6	24.	.79	95.5	23.
		1.0	83.1	8.	.30	77.4	14.	.40	75.7	14.	.49	74.1	14.	.59	72.2	15.	.70	70.2	15.	.80	68.3	15.
	-0.98	0.1	274.3	20.	.30	227.7	34.	.40	215.1	38.	.50	203.6	41.	.60	193.0	44.	.72	181.0	45.	.80	173.2	44.
		0.25	204.8	35.	.30	176.0	44.	.40	167.9	45.	.50	160.5	47.	.60	152.7	48.	.71	145.5	48.	.80	139.1	47.
		0.5	163.8	22.	.30	144.3	31.	.40	138.6	34.	.50	133.1	37.	.60	127.9	39.	.69	123.2	41.	.79	118.5	42.
		1.0	101.4	-0.	.30	101.4	-0.	.40	101.4	-0.	.50	101.4	-0.	.60	101.4	-0.	.70	101.4	-0.	.80	98.4	3.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 21

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	353.0	-2.	.30	344.0	0.	.40	340.4	1.	.51	335.8	1.	.63	330.4	-0.	.70	326.3	-2.	.80	320.7	-5.
		0.25	241.8	0.	.30	233.6	4.	.40	230.6	5.	.51	226.9	5.	.62	222.5	6.	.74	217.8	5.	.83	213.5	2.
		0.5	158.8	1.	.30	154.3	4.	.40	152.5	5.	.50	150.6	6.	.60	148.5	8.	.70	146.1	9.	.79	143.7	7.
		1.0	93.3	4.	.30	91.3	6.	.40	90.4	7.	.50	89.4	8.	.60	88.4	9.	.72	86.9	8.	.81	85.8	6.
	0.0	0.1	378.1	-2.	.30	378.1	-2.	.40	378.1	-2.	.50	378.1	-2.	.60	374.4	-1.	.70	369.3	-2.	.81	363.2	-7.
		0.26	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	275.1	-3.	.60	275.1	-3.	.70	273.0	-3.	.80	266.8	-0.
		0.57	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
	-0.98	0.1	378.1	-2.	.30	378.1	-2.	.40	378.1	-2.	.50	378.1	-2.	.60	378.1	-2.	.70	378.1	-2.	.80	378.1	-2.
		0.25	275.1	-3.	.30	275.1	-3.	.40	275.1	-3.	.50	275.1	-3.	.60	275.1	-3.	.70	275.1	-3.	.80	275.1	-3.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	180.4	-4.	.70	180.4	-4.	.80	180.4	-4.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
20.	1.0	0.1	265.3	3.	.31	236.6	12.	.43	225.0	11.	.57	212.2	11.	.57	212.2	11.	.74	197.3	12.	.78	193.4	11.
		0.25	177.2	5.	.31	162.6	11.	.42	157.2	11.	.55	151.2	12.	.67	144.7	13.	.67	144.7	13.	.78	139.3	12.
		0.5	121.1	5.	.30	114.0	11.	.40	111.4	12.	.52	108.6	12.	.63	105.6	13.	.78	101.5	12.	.81	100.9	11.
		1.0	74.2	7.	.30	71.0	11.	.41	69.8	12.	.51	68.5	12.	.63	67.0	12.	.78	65.1	10.	.80	64.8	9.
	0.0	0.1	300.5	6.	.30	265.0	17.	.42	251.4	18.	.50	241.9	18.	.60	230.6	18.	.70	219.8	18.	.79	209.5	17.
		0.25	212.9	12.	.31	192.1	18.	.43	184.5	19.	.50	179.4	19.	.60	172.9	19.	.69	166.9	20.	.80	159.6	19.
		0.5	155.7	8.	.30	144.1	15.	.41	140.0	16.	.52	135.7	17.	.59	132.7	18.	.70	128.2	18.	.81	123.3	17.
		1.0	103.0	0.	.30	100.7	2.	.40	98.8	4.	.50	96.9	6.	.60	94.8	8.	.69	92.9	10.	.82	89.6	10.
	-0.95	0.1	355.1	4.	.30	305.6	17.	.40	289.6	22.	.50	274.0	26.	.61	256.7	29.	.69	245.2	30.	.80	230.0	29.
		0.25	274.2	-3.	.30	241.0	9.	.40	230.5	13.	.50	220.2	17.	.60	209.9	21.	.70	199.9	25.	.80	193.3	28.
		0.5	180.4	-4.	.30	180.4	-4.	.40	180.4	-4.	.50	180.4	-4.	.60	176.7	-2.	.70	169.4	3.	.80	162.1	7.
		1.0	103.0	0.	.30	103.0	0.	.40	103.0	0.	.50	103.0	0.	.60	103.0	0.	.70	103.0	0.	.80	103.0	0.
30.	1.0	0.1	174.1	-2.	.31	150.1	10.	.42	142.3	12.	.55	134.2	13.	.55	134.2	13.	.70	125.0	14.	.80	119.3	14.
		0.25	124.3	1.	.31	111.8	9.	.41	107.9	11.	.54	103.4	12.	.67	98.8	12.	.67	98.8	12.	.79	94.5	12.
		0.5	91.3	3.	.30	84.2	9.	.42	81.5	10.	.53	79.1	11.	.65	76.4	11.	.65	76.4	11.	.79	73.2	11.
		1.0	59.3	3.	.30	56.3	8.	.40	55.3	9.	.51	54.3	10.	.63	53.0	9.	.76	51.6	8.	.79	51.3	8.
	0.0	0.1	187.6	9.	.30	160.0	22.	.42	151.0	23.	.51	144.7	23.	.60	138.3	23.	.70	131.6	23.	.81	124.9	22.
		0.25	141.2	9.	.31	125.3	19.	.41	120.3	20.	.51	116.1	20.	.60	111.8	21.	.69	106.1	21.	.80	103.5	20.
		0.5	109.9	11.	.31	100.6	17.	.42	97.4	17.	.50	95.0	18.	.59	92.3	18.	.71	88.9	18.	.80	86.0	18.
		1.0	80.1	10.	.30	74.9	15.	.41	73.0	16.	.53	71.0	16.	.60	69.7	16.	.69	68.1	16.	.81	66.0	14.
	-0.98	0.1	204.2	23.	.30	171.6	35.	.40	162.6	38.	.50	154.2	42.	.60	146.4	45.	.70	138.9	47.	.80	131.9	48.
		0.25	164.0	34.	.30	143.1	42.	.40	136.7	44.	.52	129.7	45.	.60	125.4	45.	.70	120.2	45.	.80	114.6	44.
		0.5	138.5	20.	.30	124.0	29.	.40	119.6	31.	.50	115.3	34.	.60	111.1	36.	.68	107.6	38.	.80	102.8	37.
		1.0	103.0	0.	.30	103.0	0.	.40	102.7	0.	.50	99.7	3.	.60	96.6	6.	.70	93.5	9.	.80	90.3	12.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 22

L/H	E_1/E_2	E/H	SHORT-TERM		P_s/P APPROX 0.3			P_s/P APPROX 0.4			P_s/P APPROX 0.5			P_s/P APPROX 0.6			P_s/P APPROX 0.7			P_s/P APPROX 0.8		
			P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR	P_s/P	P_{MEI}	ERR
10.	1.0	0.1	476.6	-4.	.30	464.7	-1.	.40	460.0	-0.	.50	454.8	0.	.62	448.5	-1.	.76	439.7	-3.	.78	437.7	-4.
		0.25	313.8	1.	.30	301.9	4.	.40	297.6	6.	.50	292.9	7.	.61	287.6	8.	.72	281.6	6.	.79	278.1	7.
		0.5	196.4	3.	.30	189.8	7.	.40	187.4	8.	.50	184.8	9.	.60	182.1	10.	.70	179.1	12.	.79	176.3	13.
		1.0	101.7	4.	.30	99.0	7.	.40	98.0	8.	.50	96.9	9.	.60	95.7	10.	.70	94.4	11.	.78	93.3	10.
	0.0	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	510.0	-3.	.60	509.5	-3.	.70	504.0	-2.	.81	497.1	-6.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	357.6	-2.	.80	349.4	0.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
	-0.98	0.1	510.0	-3.	.30	510.0	-3.	.40	510.0	-3.	.50	510.0	-3.	.60	510.0	-3.	.70	510.0	-3.	.80	510.0	-3.
		0.25	361.5	-3.	.30	361.5	-3.	.40	361.5	-3.	.50	361.5	-3.	.60	361.5	-3.	.70	361.5	-3.	.80	361.5	-3.
		0.5	228.1	-2.	.30	228.1	-2.	.40	228.1	-2.	.50	228.1	-2.	.60	228.1	-2.	.70	228.1	-2.	.80	228.1	-2.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
20.	1.0	0.1	354.7	1.	.30	314.1	11.	.43	298.8	11.	.57	281.5	11.	.57	281.5	11.	.74	261.8	10.	.81	252.8	9.
		0.25	222.5	5.	.31	201.2	12.	.42	193.7	13.	.54	186.0	14.	.54	186.0	14.	.67	177.8	15.	.81	169.0	15.
		0.5	144.6	8.	.30	132.9	15.	.41	128.9	17.	.53	124.5	17.	.55	119.9	17.	.72	117.3	17.	.80	114.1	17.
		1.0	79.8	7.	.30	76.0	12.	.41	74.6	12.	.51	73.2	13.	.62	71.7	14.	.75	69.9	13.	.81	69.0	13.
	0.0	0.1	404.8	4.	.30	354.0	16.	.40	337.9	13.	.51	321.8	18.	.61	306.7	18.	.71	291.9	18.	.80	278.7	16.
		0.25	268.9	14.	.31	239.3	22.	.40	231.0	22.	.49	222.9	23.	.60	213.7	23.	.70	204.6	23.	.81	195.5	23.
		0.5	186.9	12.	.30	171.0	20.	.39	166.2	21.	.48	161.8	22.	.59	156.0	24.	.70	150.6	24.	.81	144.2	24.
		1.0	116.8	1.	.30	111.2	6.	.40	108.5	8.	.50	105.7	10.	.60	102.9	13.	.70	100.1	15.	.81	97.0	16.
	-0.98	0.1	482.1	2.	.30	411.1	17.	.40	388.9	21.	.50	367.6	26.	.59	349.6	29.	.73	323.0	31.	.79	310.9	31.
		0.25	347.4	1.	.30	299.6	14.	.40	285.3	18.	.50	271.6	22.	.60	258.4	26.	.70	245.5	30.	.80	233.2	33.
		0.5	228.1	-2.	.30	228.1	-2.	.40	224.2	-1.	.50	214.9	4.	.60	205.7	8.	.70	196.7	12.	.80	187.7	15.
		1.0	116.8	1.	.30	116.8	1.	.40	116.8	1.	.50	116.8	1.	.60	116.8	1.	.70	116.8	1.	.80	116.8	1.
30.	1.0	0.1	227.3	-3.	.32	191.5	7.	.45	179.9	8.	.45	179.9	8.	.59	168.1	11.	.75	155.8	12.	.80	152.5	12.
		0.25	151.2	-1.	.31	132.7	10.	.42	126.9	12.	.54	121.1	14.	.67	115.0	15.	.67	115.0	15.	.79	109.5	15.
		0.5	101.6	5.	.30	92.6	12.	.41	89.7	14.	.53	86.7	15.	.65	83.5	15.	.73	81.6	15.	.81	79.7	14.
		1.0	63.3	5.	.31	59.7	9.	.41	58.6	9.	.53	57.2	10.	.65	55.9	10.	.77	54.4	10.	.80	54.1	10.
	0.0	0.1	246.1	11.	.30	206.5	24.	.41	195.3	25.	.51	185.3	26.	.51	176.5	25.	.70	168.0	25.	.81	159.5	24.
		0.25	171.7	12.	.32	149.2	20.	.40	143.9	21.	.49	138.1	23.	.60	131.7	24.	.70	126.0	24.	.80	120.9	24.
		0.5	125.6	15.	.30	112.5	22.	.40	108.8	23.	.50	105.2	24.	.60	101.5	25.	.69	98.1	25.	.80	94.4	25.
		1.0	86.1	13.	.30	79.8	18.	.40	77.9	19.	.49	76.2	20.	.60	74.1	20.	.70	72.1	20.	.79	70.2	20.
	-0.98	0.1	269.1	24.	.30	222.3	38.	.40	209.8	41.	.50	198.4	44.	.60	187.8	47.	.69	178.9	50.	.80	169.2	51.
		0.25	199.1	39.	.30	170.4	48.	.39	163.1	50.	.50	154.9	51.	.60	147.7	51.	.69	141.9	51.	.80	134.5	51.
		0.5	159.1	29.	.30	140.0	37.	.40	134.3	40.	.50	128.9	42.	.60	123.6	45.	.70	115.6	46.	.80	113.3	46.
		1.0	116.8	1.	.30	114.3	3.	.40	110.5	6.	.50	106.7	10.	.60	103.1	13.	.70	99.5	16.	.80	95.9	19.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 23

L/H	E_1/E_2'	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P, APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	375.2	-2.	.30	368.8	-0.	.40	366.2	0.	.51	362.8	-0.	.62	358.7	-1.	.75	352.6	-3.	.79	350.2	-6.
		0.25	275.8	-1.	.30	269.6	1.	.40	267.1	2.	.50	264.2	3.	.61	260.9	3.	.72	256.7	3.	.79	254.1	1.
		0.5	190.2	-1.	.30	186.5	1.	.40	185.1	2.	.50	183.5	3.	.60	181.7	4.	.70	179.6	5.	.80	177.3	6.
		1.0	118.8	-1.	.30	117.2	1.	.40	116.6	1.	.50	115.9	2.	.60	115.1	2.	.70	114.2	3.	.80	113.0	3.
	0.0	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	393.0	-2.	.70	393.0	-3.	.79	389.1	-6.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	300.9	-3.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.38	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
	-0.98	0.1	393.0	-2.	.30	393.0	-2.	.40	393.0	-2.	.50	393.0	-2.	.60	393.0	-2.	.70	393.0	-2.	.80	393.0	-2.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	300.9	-3.	.60	300.9	-3.	.70	300.9	-3.	.80	300.9	-3.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
20.	1.0	0.1	312.8	0.	.31	288.7	5.	.43	278.3	5.	.43	278.3	5.	.56	266.5	5.	.70	252.6	6.	.80	242.9	4.
		0.25	222.1	2.	.31	209.0	5.	.42	203.8	6.	.54	197.9	6.	.66	191.8	6.	.77	186.2	5.	.78	185.1	5.
		0.5	157.7	1.	.30	151.1	5.	.41	148.5	5.	.52	145.8	6.	.62	143.0	7.	.76	139.0	5.	.80	137.9	4.
		1.0	101.4	2.	.30	98.0	5.	.40	96.7	5.	.51	95.3	6.	.63	93.7	5.	.76	91.7	3.	.80	91.0	3.
	0.0	0.1	351.4	1.	.31	323.4	7.	.41	313.3	7.	.50	303.5	8.	.60	291.4	9.	.70	276.9	9.	.81	265.5	7.
		0.25	267.3	4.	.30	249.6	9.	.40	243.4	10.	.50	236.9	10.	.59	230.5	10.	.70	223.0	10.	.80	215.6	8.
		0.5	201.6	-0.	.30	191.4	5.	.39	188.2	6.	.49	184.3	8.	.59	180.1	9.	.69	175.8	9.	.81	170.3	7.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	125.5	-0.
	-0.98	0.1	393.0	-2.	.30	378.3	2.	.40	364.8	5.	.50	349.9	9.	.60	333.7	12.	.70	316.3	14.	.81	298.6	12.
		0.25	300.9	-3.	.30	300.9	-3.	.40	300.9	-3.	.50	299.6	-3.	.60	288.6	1.	.70	277.1	5.	.80	265.1	9.
		0.5	208.1	-3.	.30	208.1	-3.	.40	208.1	-3.	.50	208.1	-3.	.60	208.1	-3.	.70	208.1	-3.	.80	208.1	-3.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.
30.	1.0	0.1	226.5	3.	.31	201.1	12.	.43	191.6	13.	.57	181.2	12.	.57	181.2	12.	.74	168.8	11.	.80	163.9	11.
		0.25	169.6	1.	.31	156.3	5.	.43	151.4	5.	.56	145.7	5.	.56	145.7	5.	.70	139.8	5.	.81	135.1	5.
		0.5	127.4	-2.	.31	120.3	1.	.42	117.9	2.	.54	115.0	2.	.65	112.1	3.	.72	110.3	2.	.80	107.9	2.
		1.0	84.6	0.	.31	81.1	2.	.41	79.5	3.	.53	78.4	3.	.65	76.8	2.	.65	76.8	2.	.79	74.9	1.
	0.0	0.1	247.0	9.	.30	216.9	20.	.40	208.0	21.	.50	198.6	21.	.61	189.8	21.	.71	180.7	19.	.79	174.1	19.
		0.25	195.3	10.	.31	177.6	15.	.41	172.4	14.	.50	167.5	14.	.59	162.4	14.	.70	156.3	13.	.79	151.5	12.
		0.5	155.3	5.	.31	145.0	9.	.41	141.7	9.	.49	138.8	9.	.59	135.3	9.	.69	131.9	9.	.81	127.8	8.
		1.0	115.7	-1.	.30	109.9	4.	.39	108.0	5.	.49	105.9	6.	.60	103.6	6.	.67	101.9	7.	.79	99.2	5.
	-0.98	0.1	274.1	16.	.30	236.1	27.	.40	224.9	31.	.50	214.4	34.	.61	202.7	35.	.69	195.0	36.	.80	184.5	35.
		0.25	234.3	15.	.30	209.3	28.	.40	201.7	29.	.50	194.0	30.	.59	186.7	31.	.69	179.3	31.	.81	171.0	30.
		0.5	203.5	-1.	.30	186.2	8.	.40	180.5	11.	.50	174.9	13.	.60	169.3	16.	.69	164.3	19.	.81	157.2	20.
		1.0	127.4	-2.	.30	127.4	-2.	.40	127.4	-2.	.50	127.4	-2.	.60	127.4	-2.	.70	127.4	-2.	.80	127.4	-2.

PREDICTED CAPACITIES AND ERRORS USING ACI MOMENT MAGNIFICATION METHOD WITH MODIFIED EI - COLUMN 24

L/H	E_1/E_2	E/H	SHORT-TERM		P_S/P APPROX 0.3			P_S/P APPROX 0.4			P_S/P APPROX 0.5			P_S/P APPROX 0.6			P_S/P APPROX 0.7			P_S/P APPROX 0.8		
			P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR	P_S/P	P_{MEI}	ERR
10.	1.0	0.1	500.2	-4.	.30	491.0	-2.	.40	487.3	-1.	.50	483.1	-0.	.61	478.3	-1.	.73	471.4	-2.	.80	467.1	-4.
		0.25	354.1	-1.	.30	344.4	2.	.40	340.7	3.	.50	336.7	4.	.60	332.2	5.	.71	326.8	6.	.79	322.3	6.
		0.5	235.4	1.	.30	229.9	3.	.40	227.8	4.	.50	225.5	5.	.60	222.9	6.	.70	220.1	8.	.80	216.9	9.
		1.0	132.6	3.	.30	129.8	5.	.40	128.7	5.	.51	127.5	6.	.61	126.2	6.	.72	124.6	7.	.81	123.2	6.
	0.0	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.5	-3.	.69	526.5	-3.	.80	522.6	-5.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	392.4	-3.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
	-0.98	0.1	526.5	-3.	.30	526.5	-3.	.40	526.5	-3.	.50	526.5	-3.	.60	526.5	-3.	.70	526.5	-3.	.80	526.5	-3.
		0.25	392.4	-3.	.30	392.4	-3.	.40	392.4	-3.	.50	392.4	-3.	.60	392.4	-3.	.70	392.4	-3.	.80	392.4	-3.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
20.	1.0	0.1	406.0	-0.	.31	369.8	6.	.43	355.2	6.	.55	339.2	7.	.55	339.2	7.	.70	320.1	7.	.79	308.3	6.
		0.25	273.4	4.	.31	253.8	8.	.42	246.3	8.	.54	239.6	9.	.66	230.1	13.	.66	230.4	10.	.80	220.5	10.
		0.5	188.5	3.	.30	178.9	8.	.40	175.1	9.	.52	170.5	10.	.63	165.6	11.	.77	159.3	11.	.81	157.7	10.
		1.0	108.7	4.	.30	104.6	7.	.40	103.0	8.	.51	101.3	8.	.62	99.5	8.	.74	97.4	8.	.79	96.4	8.
	0.0	0.1	459.6	-0.	.30	416.8	8.	.40	402.1	9.	.50	387.3	10.	.60	371.2	11.	.71	353.9	11.	.80	337.7	9.
		0.25	331.1	7.	.30	303.7	14.	.40	294.9	14.	.49	286.3	15.	.60	276.7	15.	.70	266.4	16.	.81	255.9	15.
		0.5	241.6	5.	.30	226.4	11.	.39	221.7	12.	.49	216.2	14.	.59	210.7	15.	.70	204.9	16.	.80	193.6	15.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	145.4	1.	.70	142.0	3.	.80	138.4	6.
	-0.98	0.1	526.5	-3.	.30	488.7	5.	.40	468.2	9.	.50	446.9	13.	.59	426.8	16.	.72	399.3	19.	.80	380.9	19.
		0.25	392.4	-3.	.30	388.7	-2.	.40	373.8	2.	.50	358.7	6.	.60	343.6	10.	.70	328.3	14.	.80	312.8	13.
		0.5	261.9	-2.	.30	261.9	-2.	.40	261.9	-2.	.50	261.9	-2.	.60	261.9	-2.	.70	261.9	-2.	.80	261.9	-2.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.
30.	1.0	0.1	282.0	2.	.31	245.9	12.	.43	233.3	13.	.57	219.7	14.	.57	219.7	14.	.74	203.8	13.	.79	198.9	12.
		0.25	200.5	2.	.31	181.8	6.	.44	174.8	7.	.56	167.5	8.	.56	167.5	8.	.69	159.6	9.	.79	154.1	10.
		0.5	142.5	3.	.31	132.0	8.	.41	128.5	8.	.54	124.5	8.	.67	120.2	9.	.74	117.9	9.	.81	115.5	8.
		1.0	89.0	0.	.30	85.0	4.	.40	83.6	6.	.51	82.0	6.	.62	80.5	6.	.75	78.5	5.	.80	77.3	5.
	0.0	0.1	307.3	9.	.30	265.0	21.	.39	253.6	24.	.51	239.9	24.	.61	229.3	24.	.71	218.5	23.	.80	209.5	22.
		0.25	229.9	13.	.31	205.4	18.	.40	198.8	19.	.50	192.3	19.	.60	185.1	18.	.69	179.0	18.	.80	171.9	13.
		0.5	173.2	10.	.31	162.5	14.	.41	158.0	15.	.49	153.8	15.	.60	148.9	16.	.69	144.5	16.	.79	139.9	17.
		1.0	124.3	7.	.31	116.7	11.	.40	114.4	11.	.49	112.0	12.	.60	109.3	12.	.69	106.9	12.	.80	104.1	12.
	-0.98	0.1	340.1	17.	.30	287.5	30.	.40	272.7	33.	.50	258.9	37.	.60	246.0	40.	.72	230.8	41.	.80	222.2	41.
		0.25	272.4	28.	.30	238.9	36.	.40	229.1	38.	.50	219.7	39.	.59	211.1	40.	.70	201.5	40.	.81	192.5	39.
		0.5	228.9	11.	.30	206.3	19.	.40	199.3	22.	.50	192.4	25.	.60	185.6	28.	.70	178.9	30.	.80	172.0	33.
		1.0	147.8	-1.	.30	147.8	-1.	.40	147.8	-1.	.50	147.8	-1.	.60	147.8	-1.	.70	147.8	-1.	.80	147.8	-1.

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