

## PROJECT NAME:

Template Settings	Load Cases	Load Combinations
<b>OPTIONS &gt; PREFERENCES</b> <u>CONCRETE &amp; STEEL FRAME DESIGN OPTIONS</u> DESIGN CODE = ACI 2008 (CONCRETE), ASD01 (STEEL) <input type="checkbox"/> SEISMIC CATEGORY = B <input type="checkbox"/> PATTERN LIVE LOAD FACTOR = 0 <input type="checkbox"/> IF PATTERN FACTOR IS NON ZERO, ETABS INCREASES THE MID SPAN MOMENTS BY CONSIDERING BEAM AS S.S. AND LOADED WITH LIVE LOAD TIMES THIS FACTOR.  REINFORCEMENT BAR SIZES = T25 (COL DESIGN) <input type="checkbox"/> LIVE LOAD REDUCTION = NO <input type="checkbox"/>  <u>DIMENSIONS/TOLERANCES OPTIONS</u> FONT SIZE = 4 & 8 <input type="checkbox"/> AUTO ZOOM STEP = 100 <input type="checkbox"/>  <b>EDIT</b> GRIDS & BUBBLE SIZE <input type="checkbox"/> <u>STORIES</u> <input type="checkbox"/> UR LR 3 2 1 G (STORY HEIGHT = 2.0 m) BASE  <b>FILE</b> PRINT SETUP = A4 <input type="checkbox"/> USER COMMENTS & SESSION LOG = DELETE <input type="checkbox"/> <u>PROJECT INFORMATION</u> <input type="checkbox"/> COMPANY NAME = CLIENT NAME = PROJECT NAME= PROJECT NUMBER= MODEL NAME= <BUILDING NAME> MODEL DESCRIPTION= LATERAL + GRAVITY REVISION NO= ENGINEER= CHECKER=  <b>IMPORT &gt; edb</b> <input type="checkbox"/> CHECK LOAD COMBINATIONS AFTER IMPORTING FOR REPETITIONS OF LOAD CASES	<b>LOAD CASES</b> SW (DEAD) <input type="checkbox"/> SDL (SUPERDEAD) <input type="checkbox"/> LL (LIVE) (CODE: UBC-97) <input type="checkbox"/> E-X (QUAKE) (CODE: UBC-97) <input type="checkbox"/> E-Y (QUAKE) (CODE: UBC-97) <input type="checkbox"/> W-X (WIND) (CODE: UBC-97) <input type="checkbox"/> W-Y (WIND) (CODE: UBC-97) <input type="checkbox"/>  <u>WIND LOADING (UBC-97)</u> ANGLE = 0 & 90 <input type="checkbox"/> WIND SPEED = 90mi/h <input type="checkbox"/> *UBC FASTEST MILE = ASCE 3-SEC GUST SPEED / 1.18* IMPORTANCE FACTOR = 1.15 <input type="checkbox"/> EXPOSURE TYPE = C <input type="checkbox"/> INCLUDE PARAPET = 1m <input type="checkbox"/> STORY RANGE = ABOVE GROUND TO UPPER MOST <input type="checkbox"/> FOR UBC VS ASCE W-SPEED SEE IBC-2006 TABLE 1609.3.1 <u>PARAPET WIND LOADS</u> <input type="checkbox"/> ASSIGN RANGE UPTO UPPER ROOF DISPLAY> SHOW LOADS> JOINTS> WIND NOTE DOWN X & Y DIAPHRAGM LOAD REMOVE THE UPPER ROOF FROM LOAD CASE RANGE CLICK DIAPHRAGM EXTENTS NOTE DOWN THE COORDINATES FOR UPPER ROOF CREATE A NULL POINT AT THAT LOCATION APPLY NOTED JOINT LOADS ON THAT POINT *OR APPLY SHEAR & MOMENT ON JOINTS MANUALLY <u>EARTHQUAKE LOADING (UBC-97)</u> X DIR + Eccen Y <input type="checkbox"/> Y DIR + Eccen X <input type="checkbox"/> SOIL PROFILE TYPE = SD <input type="checkbox"/> IMPORTANCE FACTOR = 1.25 <input type="checkbox"/> OVERSTRENGTH FACTOR; R = 3.5 CONC & 4.5 STEEL <input type="checkbox"/> TIME PERIOD = PROGRAM CALCULATED <input type="checkbox"/> Ct in ft = 0.03 CONC & 0.035 STEEL <input type="checkbox"/>  <b>OPTIMIZE WALL LOADS BY SUBTRACTING</b> <input type="checkbox"/> BEAM DEPTH FROM STORY HEIGHT	<b>LOAD COMBINATIONS</b> <u>ADD DEFAULT LOAD COMBINATIONS</u> <input type="checkbox"/> STEEL FRAME DESIGN (FOR SERVICE) CONCRETE FRAME DESIGN (FOR ULTIMATE) EDIT LOAD COMBO NAMES IN TEXT FILE AND IMPORT AGAIN  <u>RENAME COMBINATIONS</u> ULTIMATE AS ULT-1,2,3... <input type="checkbox"/> SERVICE AS SRV-1,2,3... <input type="checkbox"/>  <u>ADD COMBINATIONS FOR DRIFTS</u> DRIFT-WX = SW+SDL+0.5LL+0.7W-X <input type="checkbox"/> DRIFT-WY = SW+SDL+0.5LL+0.7W-Y <input type="checkbox"/> CHECK EQ DRIFT BY FILE>PRINT TABLES>SUMMARY <input type="checkbox"/>  <u>MAKE ENVELOPE COMBINATIONS</u> ENV-SRV <input type="checkbox"/> ENV-ULT <input type="checkbox"/> ENV-W-DRIFT <input type="checkbox"/>  *MAKE SURE ITS "ENVE" IN TYPE <input type="checkbox"/>  <b>DEFINE &gt; MASS SOURCE</b> SW+SDL+0.25LL <input type="checkbox"/>  <b>ANALYZE &gt; SET ANALYSIS OPTIONS</b> DYNAMIC ANALYSIS = NO <input type="checkbox"/> P-DELTA: 1.2SW+1.2SDL+0.5LL <input type="checkbox"/> ITERATION BASED, MAX ITERATIONS 3 *CHECK IN LAST ANALYSIS RUN LOG IF THEY CONVERGE  <b>DESIGN LOAD COMBINATIONS</b> <input type="checkbox"/> CHECK STEEL & CONCRETE WALL DESIGN LOAD COMBOS  <b>LONG TERM DEFLECTION COMBINATION</b> <input type="checkbox"/> FACTOR = FROM ACI EQUATION 9-11 TLTD = FACTOR*(SUSTAINED LOADS) + SDL + LL+ SW SUSTAINED = ALL DEAD + 50% LIVE

**PROJECT NAME:**

Materials	Frame & Area Sections	Loads & Supports
<input type="checkbox"/> <b>MATERIALS</b> <u>CONCRETE</u> <input type="checkbox"/> 35MPA UNITS = N/mm DESIGN = CONCRETE ISOTROPIC POISON RATIO = 0.2 MASS= 2.446E-9 WEIGHT= 24E-4 f <sub>c</sub> = 35 & 40 f <sub>y</sub> & f <sub>ys</sub> = 414 E=4700(f <sub>c</sub> <sup>0.5</sup> ) FOR 35MPA: E=27805 SHEAR MODULUS = 0.4167E <sub>c</sub> [ G = E <sub>c</sub> /2*(1+v) ] EI = BENDING STIFFNESS & EA = AXIAL STIFFNESS	<input type="checkbox"/> <b>BEAMS [B-&lt;WIDTH&gt;-&lt;DEPTH&gt;]</b> <input type="checkbox"/> B-200X400 MATERIAL= 35MPA DESIGN TYPE= BEAM * <b>APPLY CORRECT COVER TO RIBS OF HCS</b> FOR DEPTH =>700mm COVER= 90  FOR DEPTH < 700mm COVER= 65	<input type="checkbox"/> <b>END RELEASES</b> <input type="checkbox"/> RELEASE BEAMS ON BEAMS
<input type="checkbox"/> <b>STEEL</b> <input type="checkbox"/> 345MPA UNITS = N/mm DESIGN = STEEL ISOTROPIC POISON RATIO = 0.3 MASS= 7.845E-9 WEIGHT= 7.698E-5 F <sub>y</sub> = 345 F <sub>u</sub> =450 E=200000 COST=1	<input type="checkbox"/> <b>COLUMNS [C-&lt;WIDTH&gt;-&lt;DEPTH&gt;]</b> <input type="checkbox"/> C-200X800 MATERIAL= 40MPA DESIGN TYPE= COLUMN TIES= RECTANGULAR TIES COVER= 60 BAR SIZE= T25 CHECK/DESIGN = DESIGN	<input type="checkbox"/> <b>ASSIGN RIGID JOINT DIAPHRAGMS</b> <input type="checkbox"/> REQUIRED ONLY FOR APPLYING WIND LOAD
<input type="checkbox"/> <b>NON-PRISMATIC SECTIONS</b> <input type="checkbox"/> <u>RECTANGULAR</u> WIDTH VARYING: E12 & EI3 LINEAR VARIATION DEPTH VARYING: E12 & EI3 CUBIC VARIATION	<input type="checkbox"/> <b>SLAB SECTIONS [??-&lt;THK&gt;]</b> <input type="checkbox"/> <u>SOLID SLABS</u> S-400 MATERIAL= 35MPA TYPE= SHELL BENDING THK = MEMBRANE THK THICK PLATE IF SPAN/THK < 15	<input type="checkbox"/> <b>SUPPORTS</b> WALLS & COLS ON MAT= FIXED <input type="checkbox"/> ISOLATED COLUMNS= PIN <input type="checkbox"/>
<u>SECTION</u> DEPTH VARYING: E12 & EI3 PARABOLIC VARIATION	<input type="checkbox"/> <b>HOLLOW CORE SLABS</b> <input type="checkbox"/> HC-350 MATERIAL= 35MPA BENDING THK=50 MEMBRANE= EQUIVALENT THK FROM TABLE TYPE= MEMBRANE 1WAY DISTRIBUTION = YES	<input type="checkbox"/> <b>MANUAL MESH</b> <input type="checkbox"/> MESH SIZE = SMALLER OF SPAN/10 OR 1m
	<input type="checkbox"/> <b>*APPLY SW OF BLOCKS IN HORDI SLABS (USUALLY 1.5kPa)</b> <input type="checkbox"/> <input type="checkbox"/> <b>*MEMBRANE DOES NOT WORK FOR RAMPS</b>	<input type="checkbox"/> <b>RESET MODIFIERS FOR FRAMES &amp; AREAS</b> DEFINE> FRANE SECTIONS > SECTION MODIFIERS <input type="checkbox"/> DEFINE> SLAB SECTIONS> SECTION MODIFIERS <input type="checkbox"/>  ALL MODIFIERS IN SECTIONS SHOULD BE 1, OTHERWISE THEY WILL BE MULTIPLIED WITH MODFIERS APPLIED BEFORE ANALYSIS IN NEXT STEP
	<input type="checkbox"/> <b>WALL SECTIONS [W-&lt;THK&gt;]</b> <input type="checkbox"/> W-200 MATERIAL= 40MPA BENDING THK = MEMBRANE THK TYPE= SHELL	<input type="checkbox"/> <b>MAKE TORSION BEAM GROUP</b> <input type="checkbox"/> IF STRUCTURAL SYSTEM HAS BOTH SOLID & HOLLOW CORE SLABS, THEN THOSE BEAMS SUPPORTING HOLLOW CORE SLABS MUST BE ASSIGNED A GROUP TO IDENTIFY EASILY TO ASSIGN MODIFIERS IN NEXT STEP
	<input type="checkbox"/> <b>IRREGULAR SHAPES</b> <input type="checkbox"/> ANY ODD SHAPE CAN TAKE AS SQUARE EQUIVALENT (SEE ACI FIG. R13.6.2.5)	<input type="checkbox"/> <b>APPLY MANUAL TORSION TO HC BEAMS</b> <input type="checkbox"/> T=(Bw+0.5C) * L/2 * LOAD C=50mm FOR HOLLOW CORE & 100mm FOR DT Bw=350mm FOR SIMPLIFICATION FOLLOW RIGHT HAND RULE FOR SIGN CHECK THE DIRECTION FOR MOMENT TO BE LOCAL 1-1 * <b>CAUTION:</b> CHECK THE APPROPRIATE OPTION FOR ADDING/REPLACING LOADS, AS IT WILL ALSO REPLACE THE GRAVITY LOADING
		<input type="checkbox"/> <b>CHECK AXIAL CAPACITY OF WALLS</b> <input type="checkbox"/> INPLANE MOMENT = M12 M11= M11+M12 <input type="checkbox"/> M22=M22+M12 <input type="checkbox"/>
		<input type="checkbox"/> <b>CHECK LOADS ON WALL</b> <input type="checkbox"/> CHECK LOADS APPLIED ON WALL ACCIDENTLY SELECT ONLY WALLS AND DISPLAY

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Just Before Running	Model Checking	Other
<input type="checkbox"/> <b>PROPERTY MODIFIERS [ACI 10.11, UBC 1910.11]</b> $I_e = (Mcr/Ma)^3 \times I_g + [1 - (Mcr/Ma)^3] \times I_{cr}$ (ACI 9.5.2.3) $Mcr = fr \cdot I_g / Y_t$ and $fr = 7.5 \times (f'c^{0.5})$ IN IMPERIAL UNITS <u>SELECT BY LINE OBJECT &gt; BEAMS</u> <input type="checkbox"/> I2=0.35    I3=0.35    J=0.35 <u>FOR GROUP = TORSION BEAMS</u> <input type="checkbox"/> I2=0.35    I3=0.35    J=1.00 <u>SELECT BY LINE OBJECT &gt; COLUMNS</u> <input type="checkbox"/> I2= 0.7    I3=0.7 <u>SELECT BY AREA OBJECT &gt; WALLS</u> <input type="checkbox"/> m11= 0.7 m22= 0.7 m12= 0.7 IF AFTER ANALYSIS WALLS ARE CRACKED REPLACE 0.7 BY 0.35 BASED ON MODULUS OF RUPTURE *m11,m22,m12 affects t* and f11,f22,f12 affects t* <u>SELECT BY WALL/SLAB SECTIONS &gt;</u> <input type="checkbox"/> SHELL SLAB SECTIONS m11= 0.25 m22= 0.25 m12= 0.25 * NO MODIFIERS FOR MEMBRANE SLAB SECTION* * THESE MODIFIERS ARE APPLIED TO USE THE SAME MODEL FOR LATERAL & GRAVITY ANALYSIS. (SEE ACI R8.8 & 10.10.4.1)	<input type="checkbox"/> <b>FILE &gt; LAST ANALYSIS RUN LOG</b> <input type="checkbox"/> "STRUCTURE IS UNSTABLE OR ILL CONDITIONED" SHOULD NOT APPEAR. <input type="checkbox"/> <b>DISPLACEMENTS</b> <input type="checkbox"/> SHOW TABLES > JOINT DISPLACEMENTS ON ENV-SRV COMBINATIONS FOR ALL STRUCTURE EXPORT TO EXCEL AND FIND UNUSUAL VALUES <input type="checkbox"/> <b>DISPLAY &gt; SHOW LOADS &gt; FRAME</b> <input type="checkbox"/> AFTER DISTRIBUTION BY TRIBUTARY METHOD <input type="checkbox"/> <b>BASE SHEAR</b> <input type="checkbox"/> SHOW TABLES > BUILDING OUTPUT > STORY SHEARS <input type="checkbox"/> <b>CHECK SEISMIC TIME PERIOD</b> <input type="checkbox"/> PRINT> PRINT SUMMARY <input type="checkbox"/> <b>CHECK DRIFT</b> <input type="checkbox"/> PRINT> PRINT SUMMARY ETABS GIVES DRIFT RATIO AS 1/X IF T< 0.7 THEN X > 0.7R/0.025 IF T=> 0.7 THEN X> 0.7R/0.020 <input type="checkbox"/> <b>MODE SHAPES</b> <input type="checkbox"/> <input type="checkbox"/> <b>AXIAL LOAD ON COL BY TRIBUTARY AREA</b> <input type="checkbox"/> <input type="checkbox"/> <b>OPENINGS MODELLED?</b> <input type="checkbox"/> <input type="checkbox"/> <b>DELETE UN-NECESSARY GROUPS</b> <input type="checkbox"/> <input type="checkbox"/> <b>ANALYZE&gt; CHECK MODEL</b> <input type="checkbox"/> APPLY GROUP TO BAD ELEMENTS CHECK LOAD TRANSFER ERROR <input type="checkbox"/> <b>WALL/COLUMN DISCONTINUITIES</b> <input type="checkbox"/> IF MODEL IS UNABLE TO RUN CHECK IF AT SOME STORIES WALLS/COLUMNS ARE DELETED ACCIDENTLY NOT MAKING A COMPLETE LOAD PATH <input type="checkbox"/> <b>THICKNESS OF SHELLS</b> <input type="checkbox"/> IF A SHELL IS DEFINED TOO THIN E.G. 1mm, TRY TO INCREASE ITS THICKNESS AND CHECK LOG AFTER EACH RUN SO THAT MODEL IS STABLE. <input type="checkbox"/> <b>BEAMS VS COLUMNS</b> <input type="checkbox"/> ALL VERTICAL LINES SHOULD BE DEFINED AS COLUMNS ALL HORIZONTAL LINES SHOULD BE DEFINED AS BEAMS CHECK BY TABLES	<input type="checkbox"/> <b>FILE/RUN ERRORS</b> <input type="checkbox"/> IF THE FILE CAN'T BE SAVED OR CAN'T BE RUN THEN CHECK FOR DISCONTINUITIES, LIKE A WALL DELETED ACCIDENTLY IN ONE STORY AND PRESENT IN UPPER & LOWER STORIES ETC. <input type="checkbox"/> <b>COLUMN VS WALL</b> <input type="checkbox"/> IF H/LEAST DIMENSION > 3, MODEL AS COLUMN (UBC) IF L> 4XTHK, MODEL AS COLUMN (ACI) <input type="checkbox"/> <b>STIFFNESS OF SUPPORTS</b> <input type="checkbox"/> FOR PIN END COLS, K=3EI/L FOR FIXED END COLS, K=4EI/L IF CORNER&EDGE COLS MODELLED AS SUPPORT ONLY, BENDING IS UNDERESTIMATED AT INTERIOR COLUMNS & SPANS <input type="checkbox"/> <b>SIZING OF MEMBERS</b> <input type="checkbox"/> $bd^2$ (in <sup>2</sup> ) = 20Mu (K-ft) $As$ (in <sup>2</sup> ) = Mu (K-ft)/ 4d (in) <u>FOR HOLLOW CORE</u> <input type="checkbox"/> MIN BEAM DEPTH = 50mm+SLAB THK+300 <u>FOR DOUBLE TEE</u> <input type="checkbox"/> MIN BEAM DEPTH=50mm+SLAB THK/2+300 TO 400 <input type="checkbox"/> <b>TIPS</b> <input type="checkbox"/> WALL LOCAL AXIS 3-3 SHOULD ALL BE INSIDE OR OUTSIDE SLAB LOCAL AXIS 3-3 SHOULD BE DRAWN ALL EITHER CLOCK OR ANTI CLOCKWISE FOR SAME ORIENTATION LINE LOCAL AXIS AVOID LIGHT COLORS FOR SECTION PROPERTIES <input type="checkbox"/> <b>FOR REVIEWING A MODEL</b> <input type="checkbox"/> SHOW ALL STORIES (ALT+V+L) RIGHT CLICK> VIEW ALL OBJECTS VIEW OPTIONS> DEFAULT <input type="checkbox"/> <b>CHECK TORSIONAL STABILITY</b> <input type="checkbox"/> VIEW>3D VIEW>XY PLAN CHECK ACCORDING TO UBC VIEW OPTIONS> DEFAULT * CHECK OTHER HOR & VER IRREGULARITIES
<input type="checkbox"/> <b>MESH</b> <input type="checkbox"/> <u>FOR WALLS &amp; SHELL SECTIONS</u> <input type="checkbox"/> 1m MAX MESH AREA SIZE <u>FOR MEMBRANES</u> <input type="checkbox"/> NO MESH		
<input type="checkbox"/> <b>CONCRETE &amp; STEEL OVERWRITES</b> <input type="checkbox"/> SWAY TYPE = SWAY ORDINARY		
<input type="checkbox"/> <b>EXTRUDE TO CHECK GEOMETRY</b> <input type="checkbox"/>		
<input type="checkbox"/> <b>CHANGE STEEL CODE TO AISC 360-05</b> <input type="checkbox"/>		
<input type="checkbox"/> <b>DISPLAY&gt; SHOW TABLES&gt; MODIFIERS</b> <input type="checkbox"/>		
<input type="checkbox"/> <b>EDIT&gt; AUTO RE LABEL ALL</b> <input type="checkbox"/> TO HAVE ARRANGED NUMBERING OF SYSTEM		
<input type="checkbox"/> <b>END OFFSETS</b> <input type="checkbox"/> ALL OFFSETS SHOULD BE AUTOMATIC, EXCEPT END OFFSETS OF BEAMS RESTING ON BEAMS SHOULD BE CHECKED AND APPLIED MANUALLY, LIKE RIBS IN HCS SLABS		
<input type="checkbox"/> <b>RIGID ZONE FACTOR SHOULD BE ZERO BY DEFAULT</b> <input type="checkbox"/>		