

SANSPRO V.5.30 Release Notes:

02-02-2024

1. New Features

Due to the use of new **Dynamic Array system**, SANSPRO V.5.30 is **very fast**. Typically **3-5 times faster** than previous version. This speed is helpful when conducting Time History Analysis which requires thousands of matrix operations.

1. Modify Fa,Fv,Ss,S1 for Near Fault Condition
2. Control Parameter for Performance Based Design (for future use)
3. Unfactored Loadcomb at separate table
4. Maximum Drift limit can be different in X,Z direction following shearwall condition
5. Coordinate offset in X,Z directions for inclined building and curved facade
6. Edit facility for multiple beam load type
7. Coordinate offset in Y directions generator for curved shape roof
8. Dome Roof shape Generator
9. Cone and Pyramid roof shape generator
10. Format Error in reading Foundation data file, fixed
11. More parallel processing to speed up graphics and calculation, faster for computer with multiple core and supporting AVX2 or AVX-512 (AMD Zen 4 CPU series 7000 or above, Intel Xeon, Intel Skylake i9/i7, Cascade Lake i9)
12. Glulam G-nn wood grade (PT Kayu Lapis Indonesia)
13. Virtual Memory is now obsolete, Dynamic Arrays are now used for all variables
Large Memory will be needed, minimum of 8 GB recommended for 32-bit version and 16 to 64 GB for 64-bit version
14. Increase analysis speed from changing to Dynamic Arrays = 3.0 to 5.0 times
15. FEM Data export using Direct memory will give faster response
16. Generate shell elements from Slab Region using user defined element size
17. Faster Stress and Moment contour drawing for Shell element
18. Ground Motion Dataset read, display and select (Export and Read)
(Ground motion must be scaled or modified accordingly before used in Sanspro)
19. Linear Time History Analysis using selected Ground Motion
20. Faster Linear Time History Methods,
Explicit : Constant Acceleration,
Implicit : Newmark-Beta, Wilson-Theta or Hilber-Alpha Method
21. Soil Data, Soil Profile and Automatic Foundation design using closest Soil Data
22. Preliminary Prestressed Beam Design
23. Pile Foundation design using axial and lateral load capacity for gravity, moderate and extreme earthquake conditions

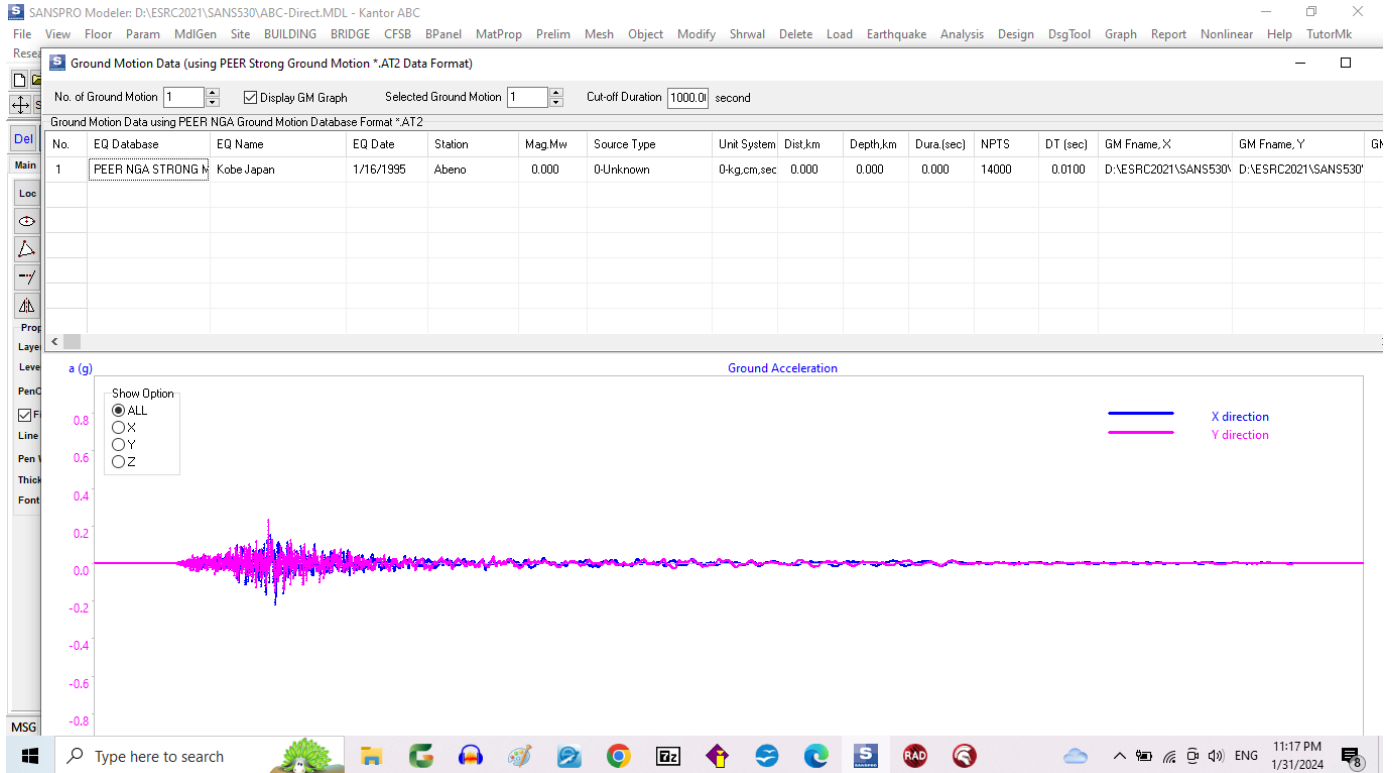
2. New License and Upgrade Price

New Personal License	: Rp. 7,000,000,-
New Corporate License (2 users)	: Rp. 12,000,000,-
Upgrade Price	: Rp. 1,000,000,- to Rp. 3,500,000 depends on version

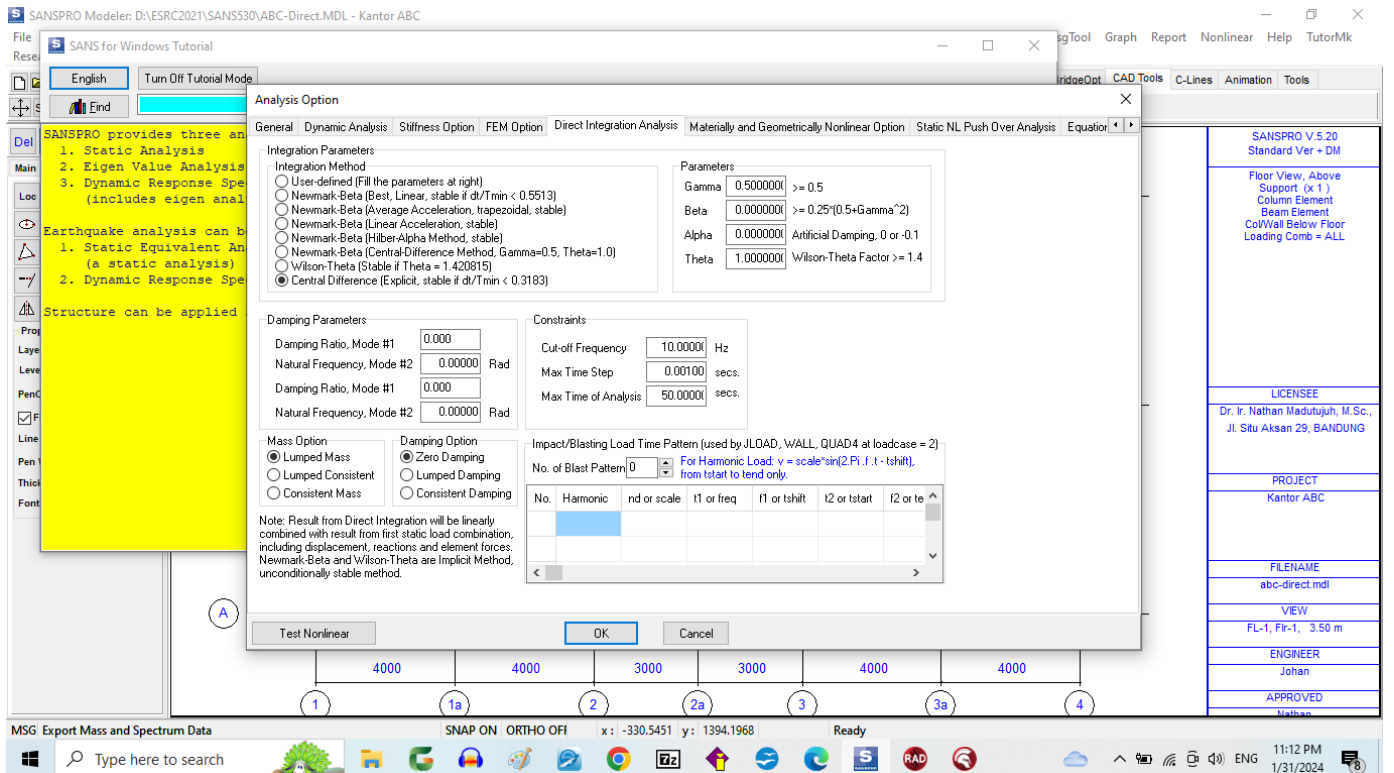
3. Contact Info

Ms. Devy Valianty (ESRC)
WA: 0838-2084-2452 (Office hours)

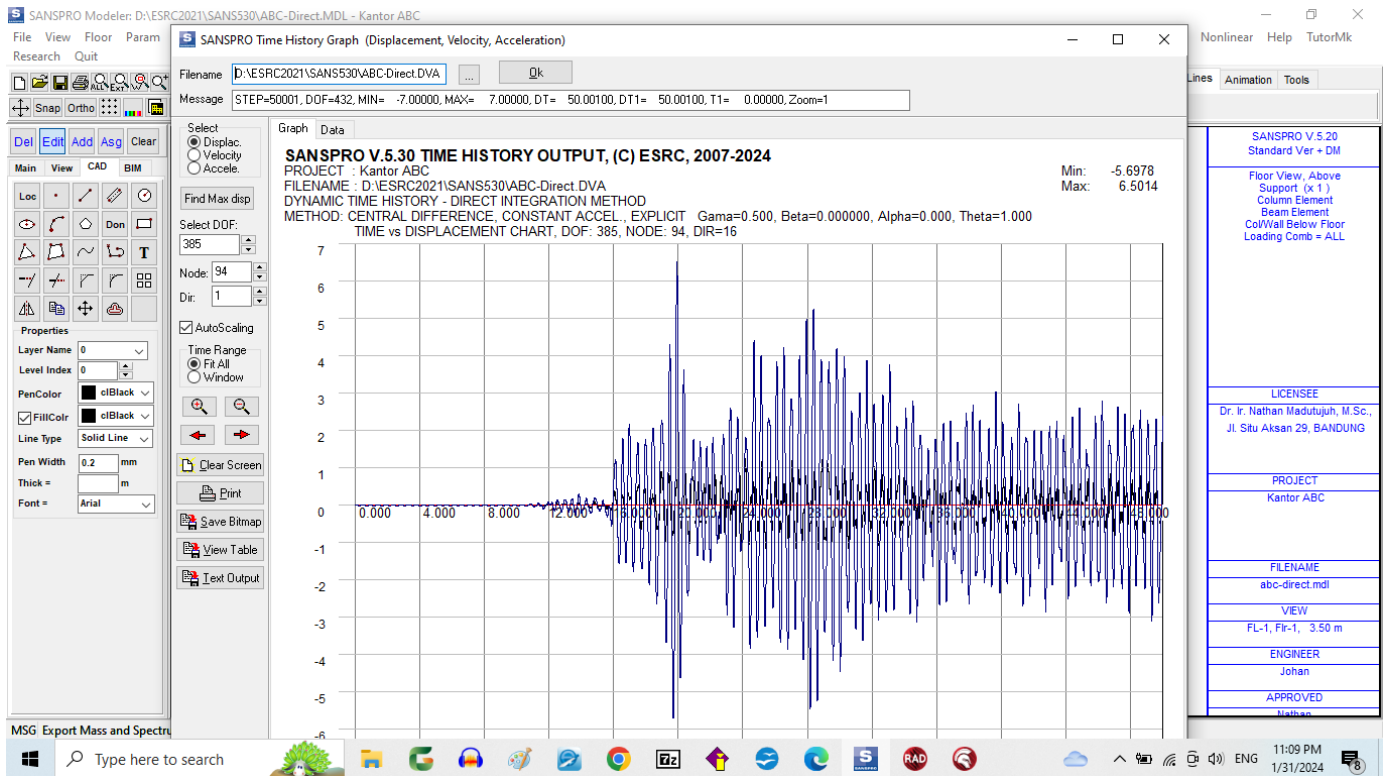
Earthquake Ground Motion Data



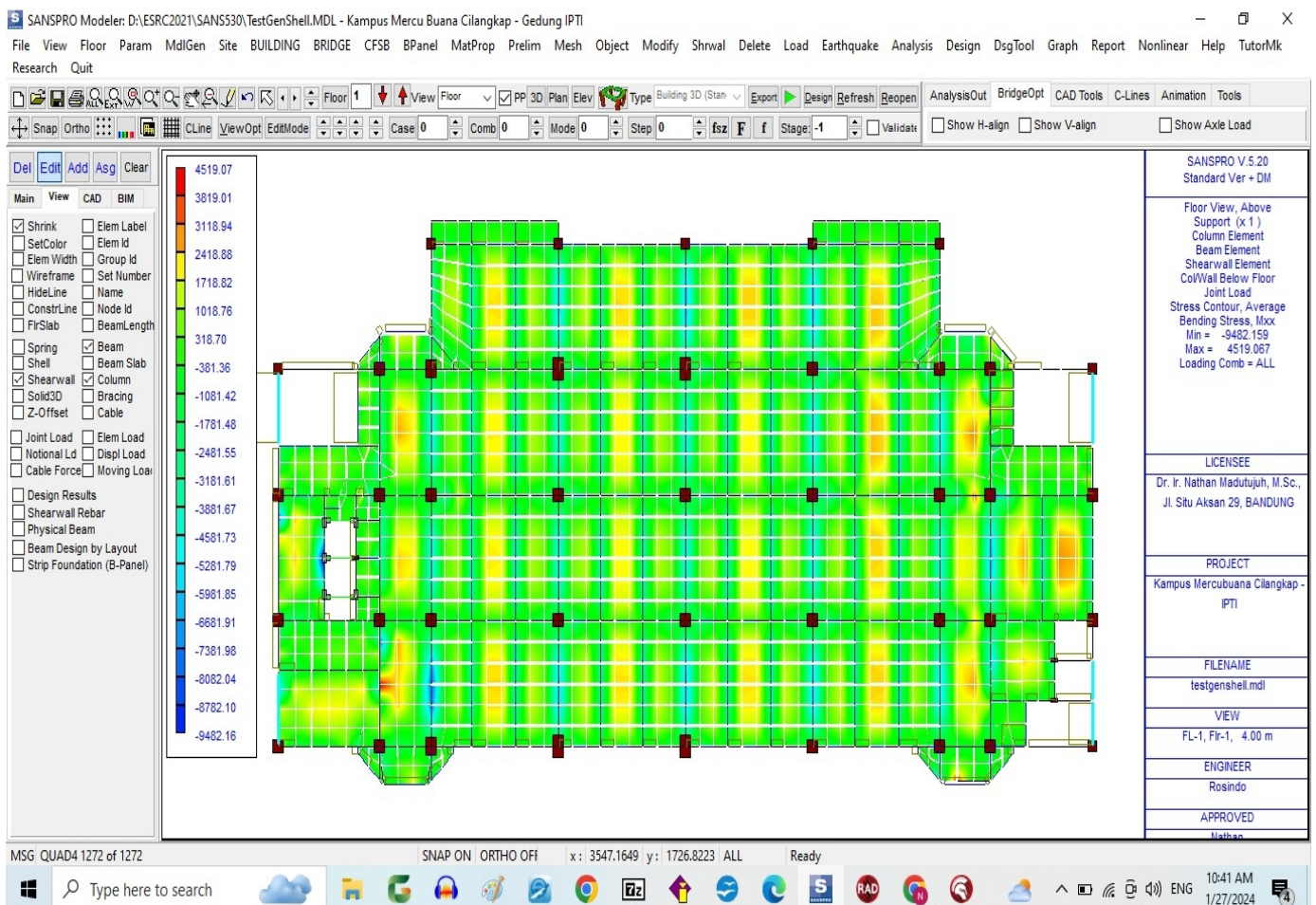
Time History Analysis – Direct Integration Method (LTHA)



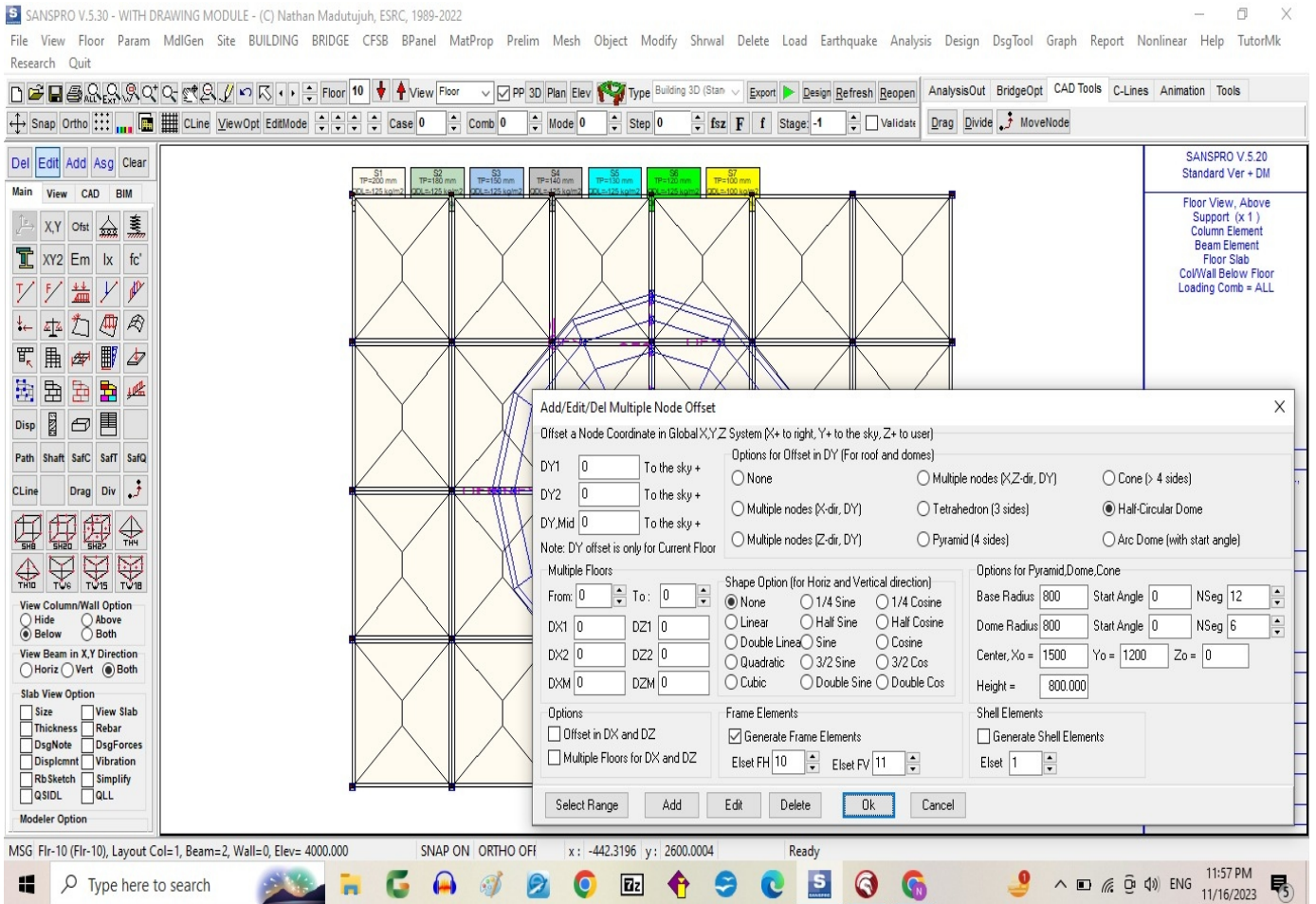
Time History Analysis Output Post-Processing



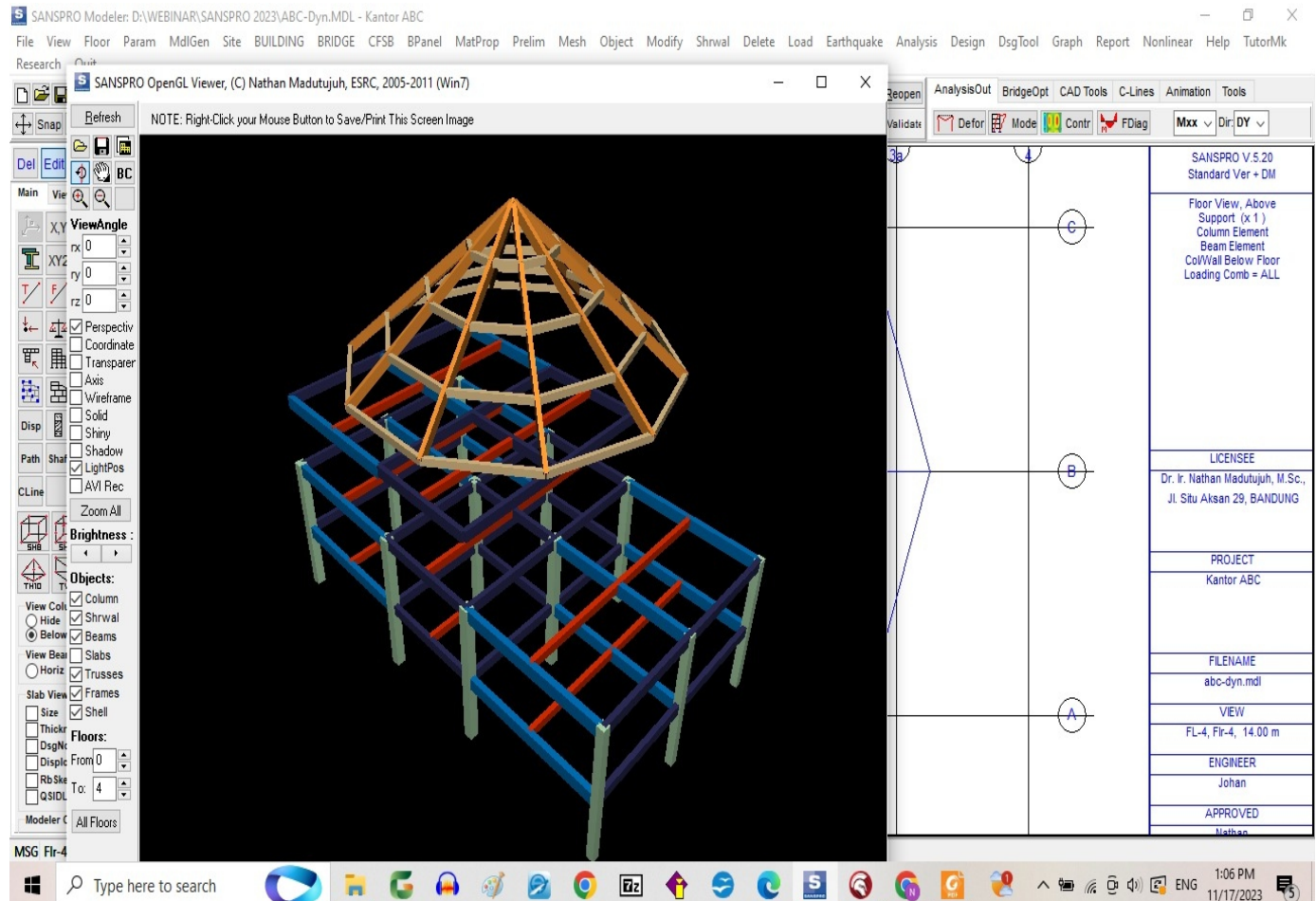
Semi-rigid floor slab generator using Shell element



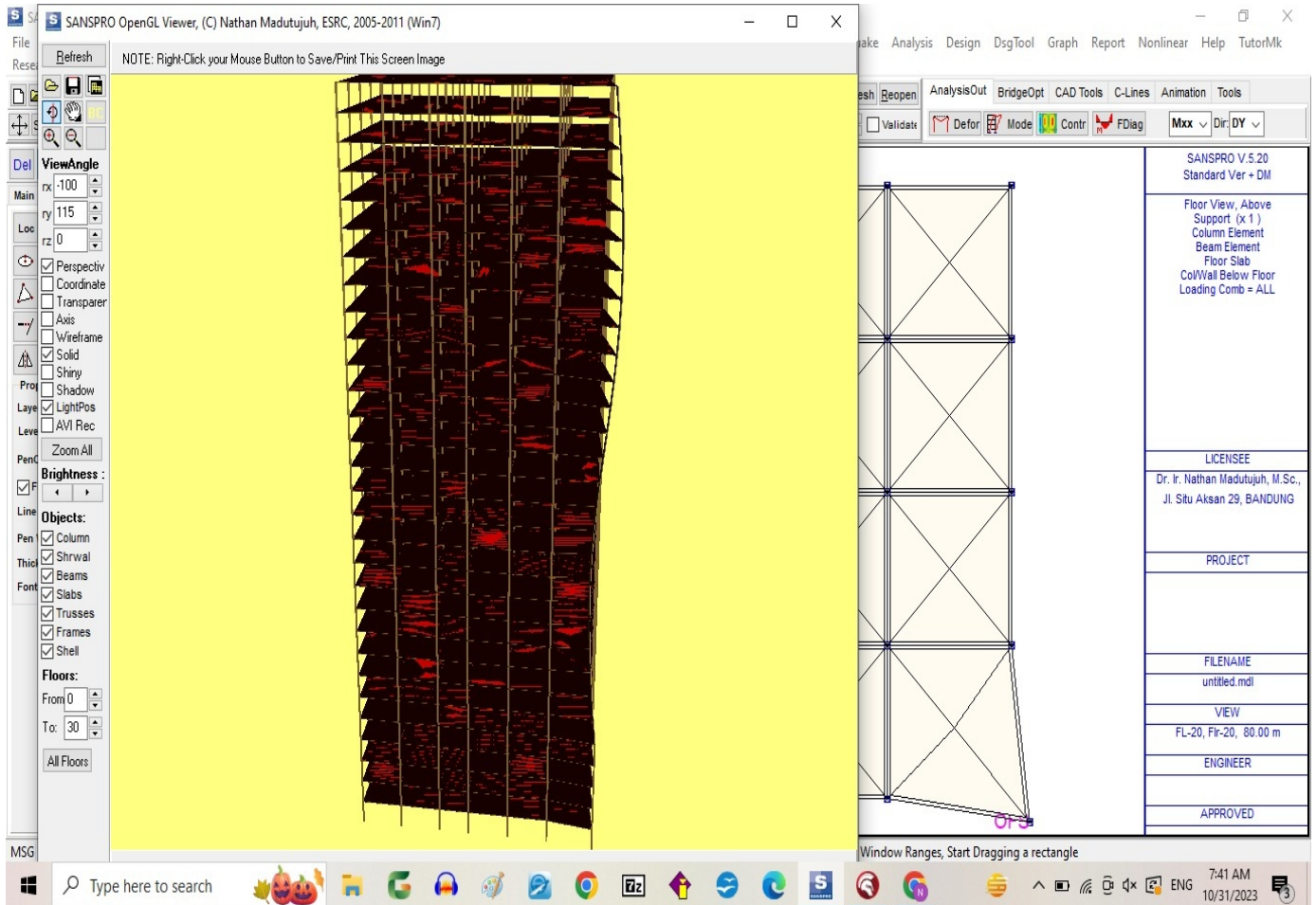
Dome Generator



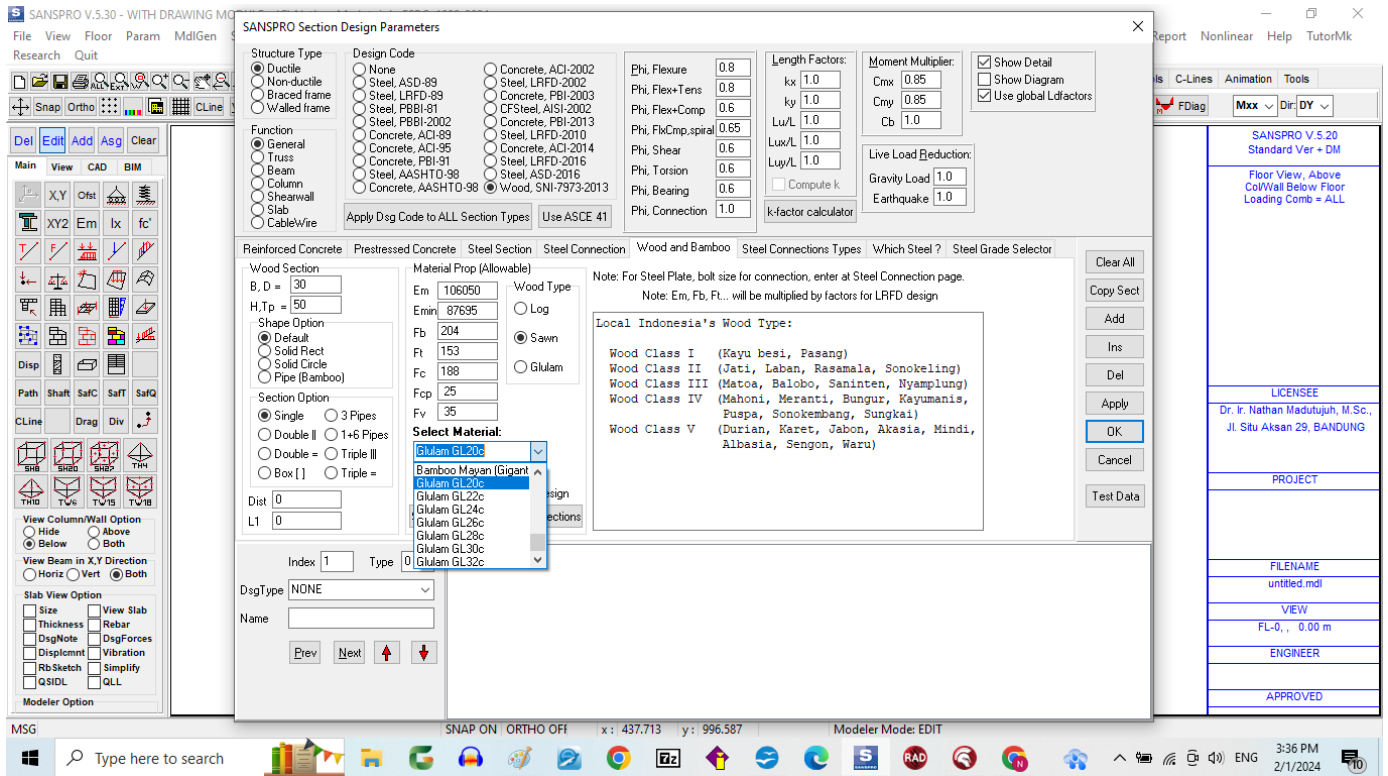
Dome Generator



Non-Vertical Buildings Facade (Inclined or curved)



Glulam Wood Design Data



Soil Data and Soil Profile

SANS-PRO Modeler: D:\ESRC2021\SANS530\TestBorLog.MDL

File View Floor Param MdlGen Site BUILDING BRIDGE CFSB BPanel MatProp Prelim Mesh Object Modify Shrwal Delete Load Earthquake Analysis Design DsgTool Graph Report Nonlinear Help TutorMk

Research Quit

Soil Layer Data Properties: Empty parameters can be automatically derived from correlation. Foundation capacity will be used if activated from Foundation Design Menu

Test Point: Global Coordinate Model Coordinate Layer Depth Footing or Pile Allowable Capacity

No. of Layer: 0
 Global: Z+ Upward
 Model: Y+ Upward

X = 0.00 m X = 0.00 cm
 Y = 0.00 m Y = 0.00 cm
 Z = 0.00 m Z = 0.00 cm

Grid/Wr Depth: 0.00 m
 Bearing Depth: 0.00 m
 C_s = 0.1 g

FrdType: DBP=0.00 cm Pc = 0.00 ton
 Len, Depth: 0.00 m Ap = 0.00 cm² Pt = 0.00 ton
 q_{allow} = 0.00 kg/cm² Kp = 0.00 cm
 Ph1=0.00 ton Ph2=0.00 ton Ph3=0.00 ton

Using Correlat:
 Derive c at
 Derive Kp
 Derive Ksv

No.	y1 (m)	y2 (m)	SoilCode	Descript	gc	fs	N _{sp}	E _{mod}	E _{m50}	G _{shr}	Poisson	G _s	Y _s	c	phi	Y _{s1}	c1	phi1	Di	
No.			USCS	Descript	kg/cm ²	kg/cm ²	N1(B0)	kg/cm ²	kg/cm ²	kg/cm ²	Ratio	ton/m ³	ton/m ³	kg/cm ²	deg	ton/m ³	kg/cm ²	deg	ar	

Clear All Add New Test Point Apply Changes and Generates Params OK Cancel

NOTE: This data is used to generate soil spring, soil pressure, and water pressure on QUAD4 Element (Shearwall and Slab) data. y1, y2, GWL are depth, + number, measured from ground level above. Bearing Depth is depth of bearing layer measured from top.

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SNAP ON ORTHO OFF x: -57.167 y: 998.294 Ready

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SANS-PRO V.5.20
 Standard Ver + DM
 Floor View, Above Col/Wall Below Floor Loading Comb = ALL
 LICENSEE
 Dr. Ir. Nathan Madutujuh, M.Sc.,
 Jl. Stu Aksan 29, BANDUNG
 PROJECT
 FILENAME
 testborlog.mdl
 VIEW
 FL-0, NONAME, 0.00 m
 ENGINEER
 APPROVED

Pile Foundation Design

SANS-PRO Modeler: D:\ESRC2021\SANS530\ABC-Direct2.MDL - Kantor ABC

File View Floor Param MdlGen Site BUILDING BRIDGE CFSB BPanel MatProp Prelim Mesh Object Modify Shrwal Delete Load Earthquake Analysis Design DsgTool Graph Report Nonlinear Help TutorMk

Research Quit

SANS-PRO Foundation Design Module (For this new version: Model can be run with any Load Factors)

Data Result Design Recommendations Pilecap Configuration

Load Factors for Design Forces
 LL Reduction Factor for Gravity: 1.00 Auto
 LL Reduction Factor for Earthq: 1.00

Design for Axial Load Only (M_x=M_z=0)
 Neglect Shear (Horizontal) Forces
 Save Detail Calculation Neglect Tension
 Increased Pile Capacity by 30%
 Reduce Pile capacity by pile weight
 Include Slab or Pilecap cost for comparison
 S.F. Tension 1.5 S.F. Shear 1.5
 Use Automatic Load Combination (18 Load combinations used, including 0.9 DL)
 Do not check for other pile type for single pile
 Show Forces per load case for each support

Foundation Capacity Design
 Foundation Capacity Design
 Multiplier for EQ Load, $0.9mF_{ac}Z = 3.00$
 Multiplier for EQ Load, $0.9mF_{ac}Z = 3.00$
 Capacity increased for temp load: 1.3
 Capacity increased for extreme load: 1.55
 High Liquefaction Risk

Axial Group Efficiency
 Not used
 Simple Formula
 Converse-Labarre*
 Los Angeles
 Seller-Keeeney

Lateral Group Efficiency
 Efficiency: 0.75 2x2
 Efficiency: 0.5 3x3

Pile Spacing Ratio
 S_{internal}: 3.0 D
 S_{1,edge}: 1.5 D

Pilecap/Footing Slab
 T_{p,min1}: 50 cm
 T_{p,min2}: cm
 Y_{soil}: 1600 kg/m³
 Auto Size
 Start w/ user thick

Concrete Properties (user defined)
 Phi, Moment: 0.9
 Phi, Shear: 0.65
 Comp Strength, f_c: 291 kg/cm²
 Concr. Cover, Top: 5.0 cm
 Concr. Cover, Bot: 10 cm
 Pile Embedded Len: 7.5 cm

Tie Beam/Sloof Size
 B: 30 cm H: 60 cm
 L: 8.0 m W: 6 m
 Uplift Nett Head for Tie Beam Head: 0 m

Rebar Properties (user defined)
 Rebar Diameter, db: 1.6 cm
 Stirrups Diam., dbv: 1.0 cm
 Side bar Diam., db_s: 1.2 cm
 Rebar F_y: 3900 kg/cm²
 Rebar F_{yv}: 2400 kg/cm²
 Rebar F_{y,side}: 2400 kg/cm²
 Pilecap/Slab MinRebar: 0.20 % (Range: 0.18% to 0.25%)

Foundation Strengthening
 Existing Foundation capacity
 Comp, Po = 0.0 ton
 Tension, To = 0.0 ton
 Lateral, Ho1 = 0.0 ton
 Lateral, Ho2 = 0.0 ton
 Lateral, Ho3 = 0.0 ton
 Note: Support reactions will be reduced by Existing Found Cap.
 Auto Pcap Rebar Selection
 Min Rebar Spacing: 10 cm
 Additional Options
 Avoid np = 3, use 2x2 piles
 Avoid np = 7, use 4x2 piles
 Avoid np = 8, use 3x3 piles
 Avoid np = 10, use 4x3 piles
 Avoid np = 15, use 4x4 piles
 Avoid np = 24, use 5x5 piles
 Avoid np = 35, use 6x6 piles
 Check All

Material Cost
 Concrete: 1200000 /m³
 Rebar: 13500 /kg

Earthquake Opt:
 Report Option (Idx Numb)
 ALL 1-10 Range
 1 Range
 Report Idx Range: Start Idx 0 End Idx 0
 Capacity from SOILDATA
 Generate Only Design Forces for Foundation Design
 View SOIL DATA

No.	Foundation Type	Size (a=b=D)	Thickness	Depth or L	Soil Strength	P _{comp,allow}	P _{tens,allow}	P _{horiz,6 mm}	P _{horiz,12 mm}	P _{horiz,25 mm}	Cost
		cm	cm	m	qa (kg/cm ²)	Pc (ton)	Pt (ton)	PH1(ton)	PH2(ton)	PH3(ton)	Unit Price
1	3(Square Pile)	30		20		60	30	3	4		

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SANS-PRO V.5.20
 Standard Ver + DM
 Floor View, Above Support (x 1) Column Element Beam Element Col/Wall Below Floor Loading Comb = ALL
 LICENSEE
 Dr. Ir. Nathan Madutujuh, M.Sc.,
 Jl. Stu Aksan 29, BANDUNG
 PROJECT
 Kantor ABC
 FILENAME
 abc-direct2.mdl
 VIEW
 FL-1, FR-1, 3.50 m
 ENGINEER
 Johan
 APPROVED
 Nathan