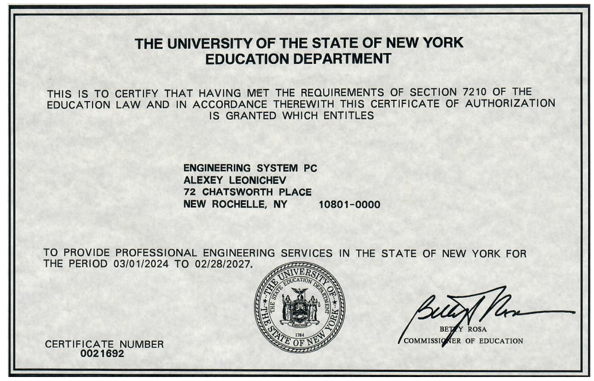
Engineering System, P.C.
P.O. Box 342, New York, NY 10014
E-mail: system@the-system.com
ph+1(646)584-5624; www.the-system.pro

Certified by New York State
Education Department to
provide Engineering Services
Certificate 0021692

Principal Engineer Alexey Leonichev, P.E. has 34 years of experience in design and construction, including 23 years in the US.
He is licensed and registered in the States of:
NY license #088085; **CT** license #0027112
PA license #076790; **MD** license #37184
OH license #74082; **MI** license #6201056424.
Expertise: Structural and Geotechnical Design and Analysis, Hydrology and Hydraulic Study, Grading Plans, ADA Compliance, Forensic Investigations and Engineering Surveying,


THE UNIVERSITY OF THE STATE OF NEW YORK
EDUCATION DEPARTMENT

THIS IS TO CERTIFY THAT HAVING MET THE REQUIREMENTS OF SECTION 7210 OF THE EDUCATION LAW AND IN ACCORDANCE THEREWITH THIS CERTIFICATE OF AUTHORIZATION IS GRANTED WHICH ENTITLES

ENGINEERING SYSTEM PC
ALEXEY LEONICHEV
72 CHATSWORTH PLACE
NEW ROCHELLE, NY 10801-0000

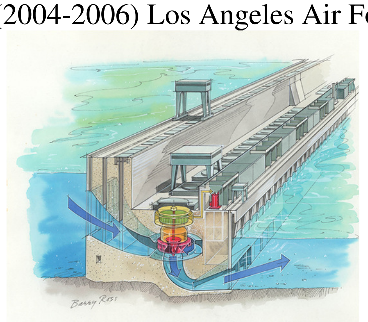
TO PROVIDE PROFESSIONAL ENGINEERING SERVICES IN THE STATE OF NEW YORK FOR THE PERIOD 03/01/2024 TO 02/28/2027.

CERTIFICATE NUMBER
0021692

BETTY ROSA
COMMISSIONER OF EDUCATION

<u>Most significant projects</u>:

(2018-2020) New York Power Authority Power Plants reconciliation
(2013-2014) Westinghouse Electric Company AP1000 Nuclear Power Plant
(2004-2006) Los Angeles Air Force Base, Space and Missile Center



Alexey Leonichev, P.E., will be glad to serve you as Engineer of Record for all your Engineering and Construction Projects and will provide you with a Complete Service Cycle starting from empty piece of land from subdivision to the final turnkey. Please visit **www.the-system.pro** for more information

Attached please find Design Samples (next pages)

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RFP-RC-2024-005 Technical Proposal

Engineering Design Services - Wesley Chapel Dam near Spook Rock Road on the Willow Tree Brook

Prepared for Rockland County NY
Department of General Services Purchasing Division
as a response to RFP-RC-2024-005

RFP-RC-2024-005 Engineering Design Services - Wesley Chapel Dam

Produced by or under direct supervision of Alexey Leonichev, P.E.
Warning: *It is a violation of 145 NYS Ed. Law to alter this Document in any way.*

2/22/2024

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I. Executive Summary

a) Structural Instabilities Report of 01/31/2024 (*attached*) shows new dangerous unforeseen conditions not observed by Todd Mueller, P.E. Memorandum four years ago in April 2020:
   1) Concrete Deck is structurally disintegrated and thus lost capacity to resist AASHTO loads.
   2) Progressive slope failure at the base compromises overall Dam stability.

b) All the above proposes that Wesley Chapel Dam is unstable, and collapse is in progress. As per 1st Newton's Law, instability – is a product of unbalanced force: "*Body in a rest will be in a rest until external force will apply*". New proposed installations (*New Low-Level Outlet, Enragement of Culvert, or Raising Dam Crest, etc*.) will compromise geometrical and gravitational properties and impose new construction load on already unstable Dam. Consequently, collapse in progress could be accelerated and cause unpredicted consequences. Neither one installation can be attached to unstable Dam without imposing serious risk of its failure.

c) Either intentional demolition or accidental collapse of the Wesley Chapel Dam will cause significant redistribution Willow Tree Brook and Mahwah River tributary watersheds and, consequently, could cause unpredictable reversal of Mahwah River to original 1910-year waterbed and, consequently, to uncontrolled flooding. Detailed Hydrology Study must be performed in advance of any modification of dam structure.

d) **<u>Executive Summary</u>**: **Newly discovered unforeseen conditions propose immediate closure of dangerous Wesley Chapel Dam for vehicular and pedestrian access and traffic. All provisions of Todd Mueller, P.E. April 2020 Memorandum should be considered as obsolete and prohibited for safety's sake.** *Hydrologic and Hydraulic Analysis Report of 07/11/2019 (Addendum 3) doesn't include considerations on possible collapse of the Wesley Chapel Dam and consequent redistribution Willow Tree Brook and Mahwah River tributary watersheds and, unpredictable reversal of Mahwah River to original 1910-year waterbed.*

II. Detailed Response Proposal – New Scope of Work

a) Emergency Structural Stability Evaluation of Wesley Chapel Dam with production of detailed Report and recommendations of stabilization and safety measures – $5000

b) Phase 1: New Bridge design and installation; Spook Rock Road rerouting – $2,005,892. (*Estimate attached*)

c) Phase 2: Detailed Hydrology Study *considerations on possible collapse of the Wesley Chapel Dam and consequent redistribution Willow Tree Brook and Mahwah River tributary watersheds and, unpredictable reversal of Mahwah River to original 1910-year waterbed*. (Rational Method) – $5,000

d) Hydrological Design – $15,000

e) As-built drawings productions and maintenance recommendations – $5,000

III. Value-added Considerations

a) On a discretion of Rockland County, the additional services could be performed: Emergency Detour of Spook Rock Road

IV. Protected Information

a) This Project doesn't have known Protected information yet.

V. Cost Proposal - $2,005,892 Total

a) $5,000 (Emergency Structural Stability Evaluation)

b) $2,005,892 Phase 1: New Bridge design and installation; Spook Rock Road rerouting (Estimate attached)

c) $5,000 Phase 2: Detailed Hydrology

d) $15,000 Hydrological Design

e) $5,000 As-built drawings productions and maintenance recommendations

VI. Exception to RFP – Term and Conditions

a) This Project doesn't have Exceptions to RFP Term and Conditions.

VII. Redacted Proposal – not developed.

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RFP-RC-2024-004 Wesley Chapel Dam Structural Instabilities Report

Attention: Unsafe Dam – do not discard

Review of RFP-RC-2024-004 and Google Street View has revealed that Wesley Chapel Dam could be unsafe to use. Thus, on 01/25/2024 the actual visual observation was conducted and revealed multiple major structural instabilities and structural disintegration.

I. OBSERVATION CONDITIONS

1.1 Date and time of Observation: 01/25/2024, 12:00pm –1:00pm`

1.2 Weather condition: rain, wind ≈ 5 MPH; ambient temperature ≈ 50 °F

1.3 Observation Method: visual observation and selective measurements

II. FINDING (*see attached 24x36 drawing for referred views and photographs*)

2.1 Wesley Chapel Dam pavement is based on the rigid Concrete Deck expected to provide high bending resistance for ASHTO loading. The middle span of it does not maintain intimate contact with, and does not distribute loads to the subgrade, does not depend on aggregate interlock, particle friction, and cohesion for stability. Thus, this is **RIGID PAVEMENT**, as defined by Ch.1 NYS DOT Comprehensive Pavement Design Manual.

2.2 Photos 2; 3; 4 and 6 show **RIGID PAVEMENT SPALLING –** cracking within 2ft of another crack and therefore, Concrete Deck **Depth is affected** and requires repair as provided by Ch.2 NYS DOT Comprehensive Pavement Design Manual. **This constitutes loss of integrity, rigidity and bearing capacity of Concrete**.

2.3 Photos 11; 13; 14 and 15 show partially exposed wide flange (WF) shape incorporated in Concrete Deck as a bending resisting element. The body loss due to rust doesn't allow us to consider it as a structural member able to resist applicable ASHTO loads. **RIGID PAVEMENT SPALLING** (as indicator of rigidity loss) proposes that all other bending members are in the same condition. Thus, the Concrete Deck doesn't have capacity to resist ASHTO loads.

2.4 USGS maps of 1910 and 1931 downloaded from apps.nationalmap.gov propose that Wesley Chapel Dam is at least 93 years old, i.e. 18 years exceeded 75 years Design Life 2005 AASHTO LRFD Design Specification.

2.5 Photos 7; 12; 14 and 15 show significant slope failure at the base endangering whole DAM stability. The potential Dam failure can cause hydrological reversal of Mahwah River watershed and riverbed back to original condition before the DAM installment.

III. PROFESSIONAL ENGINEER'S OPINION

Based on all the above, I, Alexey Leonichev, P.E., have a strong opinion: **Wesley Chapel Dam is unsafe to use and must be closed immediately** in order to avoid negative consequences such as traffic accidents, life losses and uncontrolled flooding due to unpredictable reversal of Mahwah River watershed and riverbed.

01/31/2024

STATE OF NEW YORK ★ ALEXEY LEONICHEV ★ EXCELSIOR 088085 LICENSED PROFESSIONAL ENGINEER

RFP-RC-2024-005 Wesley Chapel Dam Major Structural Instabilities Report

Attention: UNSAFE DAM - DO NOT DISCARD

OFFICIAL USE ONLY

REV.	REVISION COMMENT	DATE

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www.the-system.pro

STATE OF NEW YORK · ALEXEY LEONICHEV · LICENSED PROFESSIONAL ENGINEER · 088085

Project Title: RFP-RC-2024-005 Wesley Chapel Dam Major Structural Instabilities Report

Drawing Title: Emergency Structural Observation of 01/25/2024

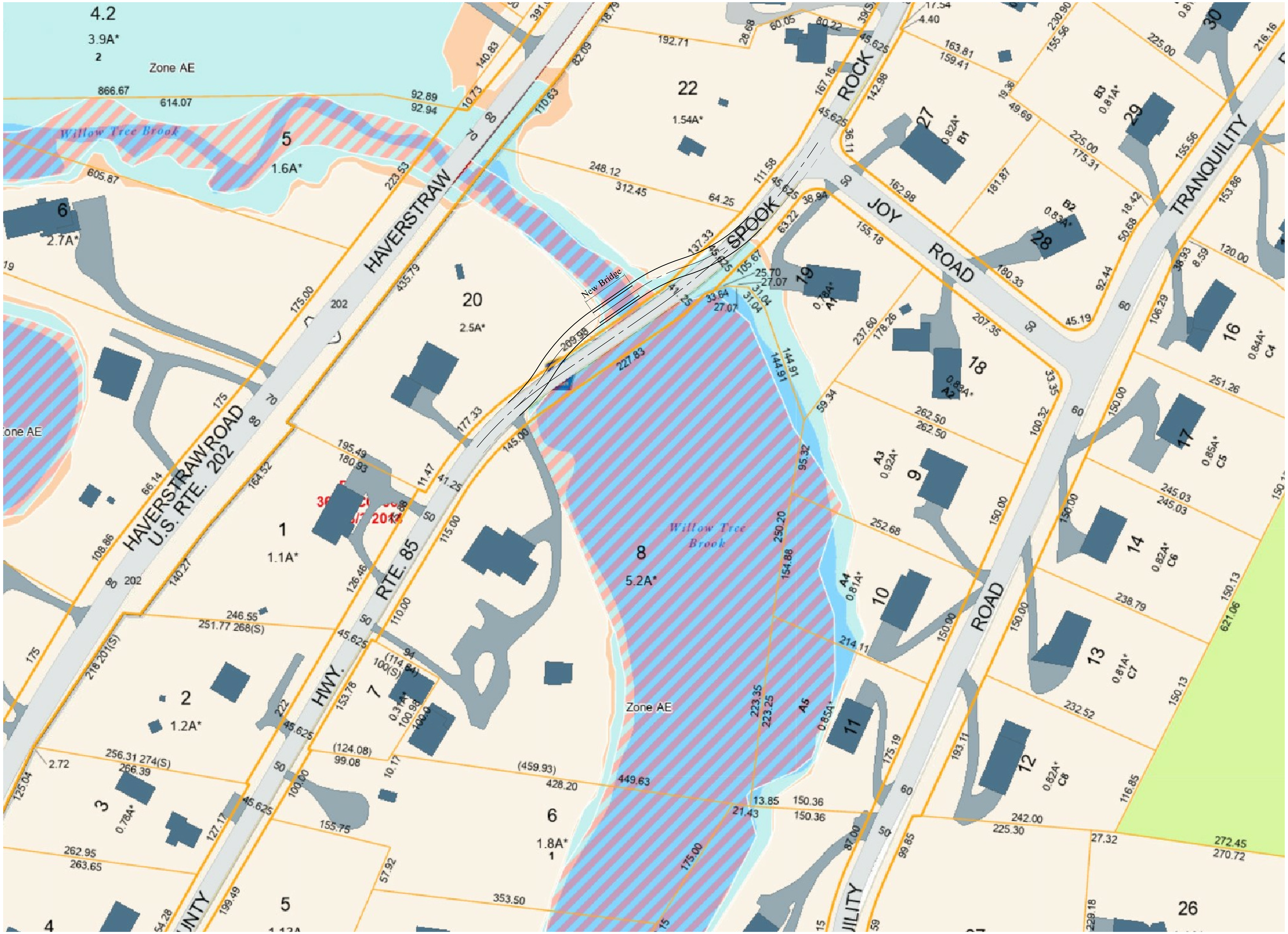
Owner: Rockland County, NY

Drawing by: Alexey Leonichev

Checked by: Alexey Leonichev

Drawing index: S-1

Sheet 1 of 1 | N.T.S



Preliminary Concept
Not for Construction

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REV.	REVISION COMMENT	DATE

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system@the-system.com
www.the-system.pro

STATE OF NEW YORK
ALEXEY LEONICHEV
088085
LICENSED PROFESSIONAL ENGINEER

Project Title:
RFP-RC-2024-005 Wesley Chapel Dam
Phase 1 New Bridge and Road Installation

Drawing Title:
New Bridge & Road Location
Preliminary Concept

Owner:
Rockland County, NY

Drawing by: Alexey Leonichev

Checked by: Alexey Leonichev

Drawing index:
C-1

Sheet 1 of 1 | N.T.S

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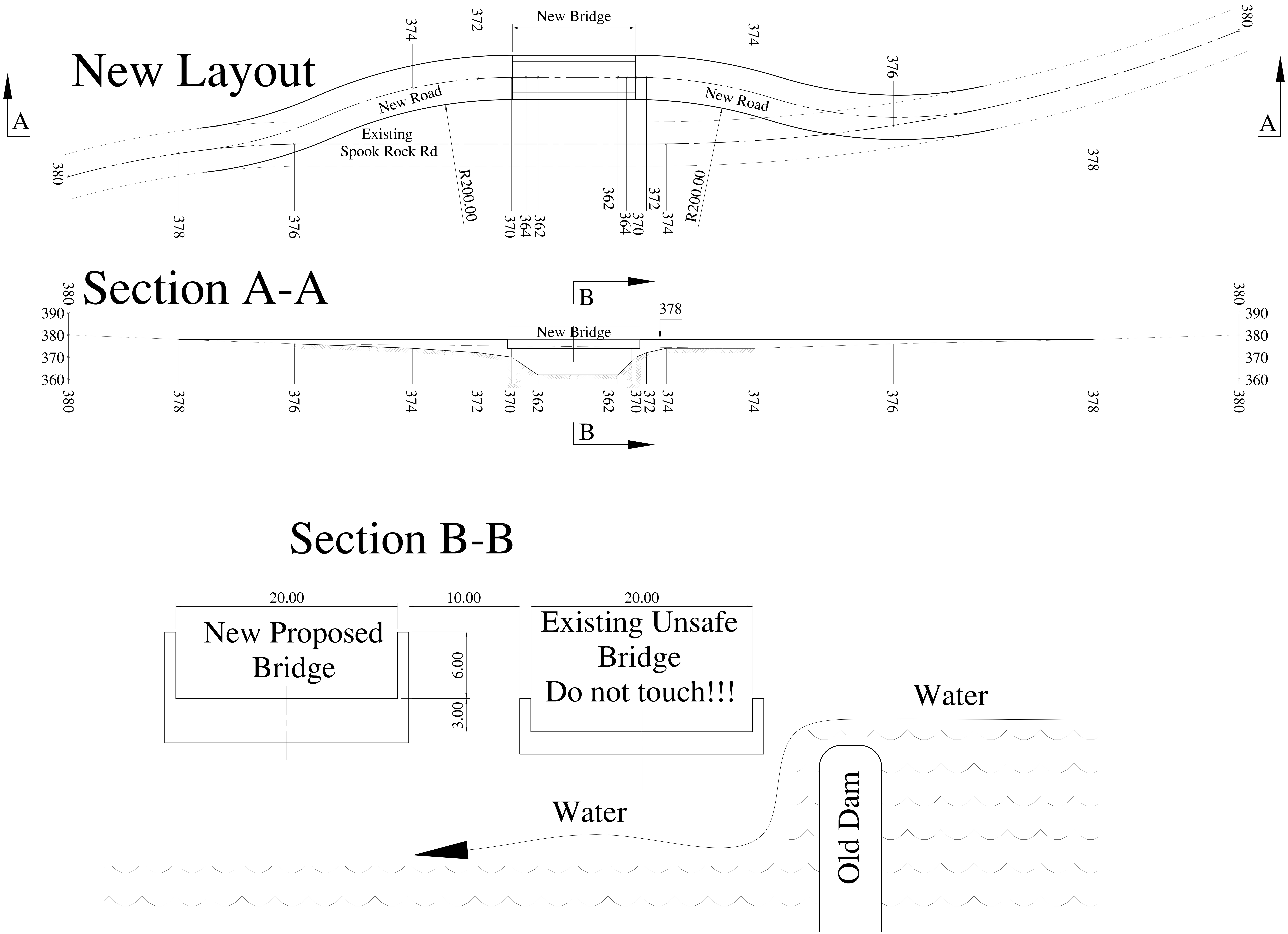

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Project Title: RFP-RC-2024-005 Wesley Chapel Dam Phase 1 New Bridge and Road Installation

Drawing Title: New Bridge & Road Details Preliminary Concept

Owner: Rockland County, NY

Drawing by: Alexey Leonichev

Checked by: Alexey Leonichev

Drawing index:
C-2

Sheet 1 of 1 N.T.S

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$2,005,892 Cost Proposal

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Prepared for Rockland County NY
Department of General Services Purchasing Division
as a response to RFP-RC-2024-005

RFP-RC-2024-005 Engineering Design Services - Wesley Chapel Dam

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STATE OF NEW YORK ALEXEY LEONICHEV 088085 LICENSED PROFESSIONAL ENGINEER

2/22/2024

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a) $5,000 (Emergency Structural Stability Evaluation)
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c) $5,000 Phase 2: Detailed Hydrology
d) $15,000 Hydrological Design
e) $5,000 As-built drawings productions and maintenance recommendations

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Nonstructural Components
Seismic Restraints Structural Analysis
Detail 5, h=72”
Drawing 009-C-104 sheet 1

Prepared for L.K. Comstock / Skanska Joint Venture
309 East 94th St, New York, NY 10128
MTACC Contract #C-26009
2nd Ave Subway Route 132A
Track, Signal, Traction Power and Communications
96th Street Station - IND - ZONE 31
Traction Power Substation DC Connection
Reference Drawing № 009-C-104

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6/15/2016

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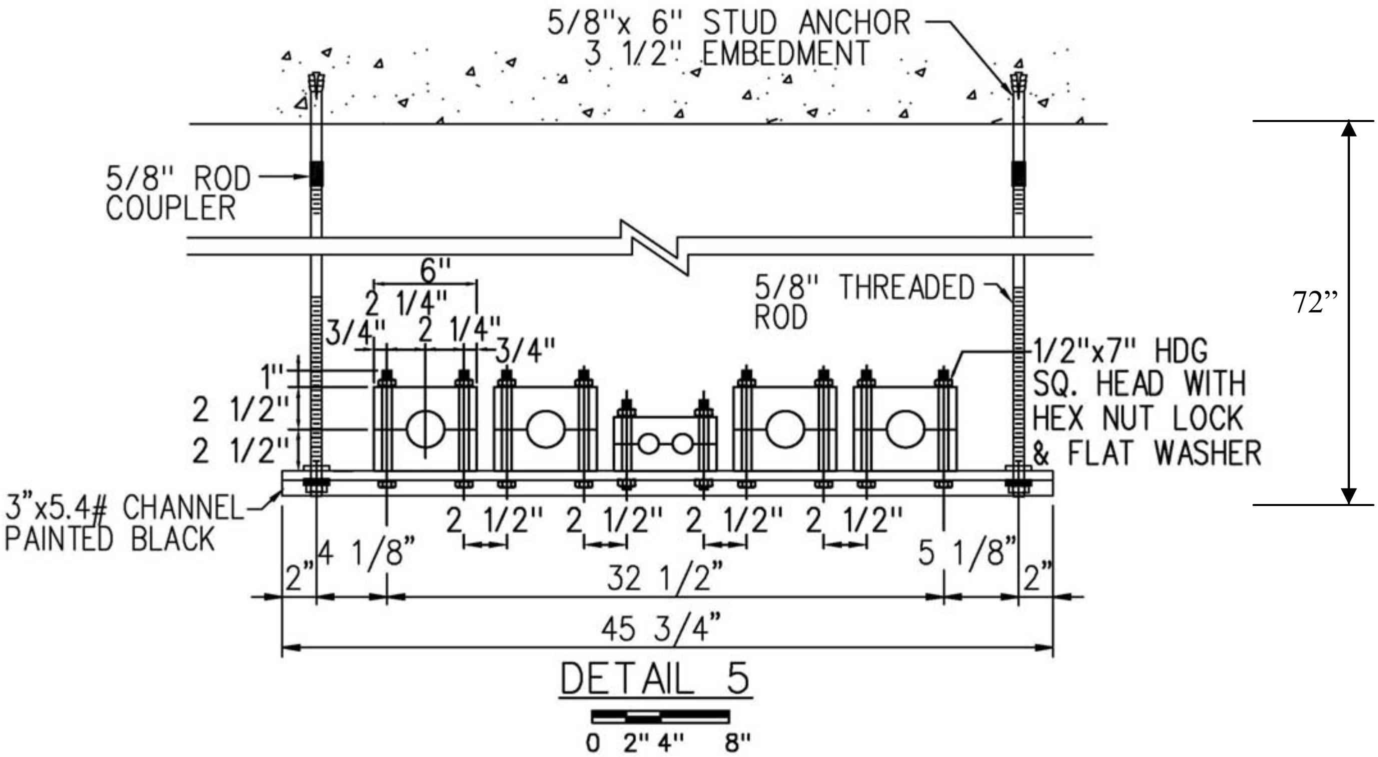
I. Customer's Order and Design Data provided:

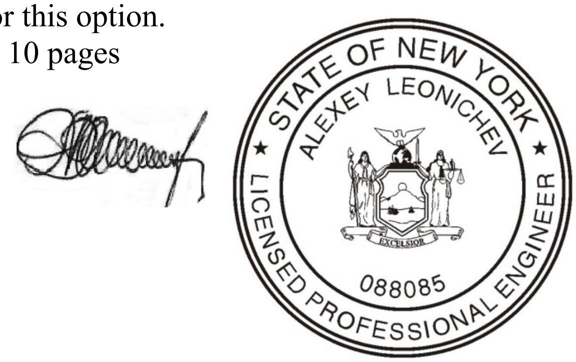
a) Perform structural analysis (in-plane forces) for Detail#5 as shown on MTA - New York City Transit Capital Construction approved drawing № 009-C-104 sheets 1



b) Utilize Governing Design Provisions of NYS BC 2007; AISC Manual 9th Edition; ACI 318
c) Cable Gravity Loads equivalent to Ǿ0.75" round steel rod, weight 1.503 lb/ft
d) Minimum Uniformly Distributed Live Load L=75 psf [Table 16A UBC-1997(9) light manufacturing; or Table 1607.1(13) NYC BC 2014, mechanical and electrical equipment]

I. Structural Analysis Result and Engineer's Opinion:

1) Detail 5 Suspended Trapeze Support h=72" capable to withstand NYS BC 2007 most critical load combination including but not limited to seismic lateral force generated by 5 x Ǿ0.75" round steel rods 1.503 lb/ft each vs. 1.284 lb/ft heaviest cable proposed.
2) Thus, no additional lateral support required for this option.
3) See Structural Analysis and Calculations next 10 pages



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II. NYS BC 2007 & ASCE 7-10 prescribed Design Data

a) Assumed Structural Occupancy Category III (Table 1604.5 NYS BC 2007), Seismic I = 1.25;
b) Component Importance Factor $I_p = 1.5$ (13.1.3 ASCE 7-10)
c) Assume Site Class D (soils properties not known, 20.1 ASCE 7-10)
d) Mapped Acceleration Parameter S_s =0.25 (Figure 22-1 ASCE 7-10)
e) Mapped Acceleration Parameter S_1 =0.073 (Figure 22-2 ASCE 7-10)
f) Site Coefficient F_a = 1.6 (Table 11.4-1 ASCE 7-10)
g) Site Coefficient F_v = 2.4 (Table 11.4-2 ASCE 7-10)
h) $S_{MS} = F_a * S_s =$ 1.600 * 0.250 = 0.400 (11.4.1 ASCE 7-10)
i) $S_{M1} = Fv * S_1 =$ 2.400 * 0.073 = 0.175 (11.4.2 ASCE 7-10)
j) $S_{DS} = \frac{2}{3} S_{MS} =$ 0.667 * 0.400 = 0.267 (11.4.3 ASCE 7-10)
k) $S_{D1} = \frac{2}{3} S_{M1} =$ 0.667 * 0.175 = 0.117 (11.4.4 ASCE 7-10)
l) Seismic Design Category B. Per Table 11.6-1 ASCE 7-05, for S_{DS} = 0.267 and Occupancy Category III, determined Seismic Design Category B. Per Table 11.6-2 ASCE 7-05, for S_{D1} = 0.117 and Occupancy Category III, determined Seismic Design Category B.
m) Component amplification factor a_p = 1.0 (Table 13.6-1 ASCE 7-10)
n) Component amplification factor R_p = 1.5 (Table 13.6-1 ASCE 7-10)
o) Component attachment elevation respectively to base z=0 (13.3-1 ASCE 7-10), and [1+2(z/h)]=1
p) Seismic Design Coefficient $C_S = [(0.4a_pS_{DS}I_p)/R_p] \times [1+2(z/h)] = (0.4a_pS_{DS}I_p)/R_p$ (13.3-1 ASCE 7-10
q) Seismic Design Coefficient $C_S = (0.4 \times 1 \times 0.267 \times 1.5)/1.5 = 0.107$
r) Seismic Design Coefficient $C_{S\ max} \leq 1.6S_{DS}I_p = 1.6 \times 0.267 \times 1.5 = 0.640$ (13.3-2 ASCE 7-10)
s) Seismic Design Coefficient $C_{S\ min} \geq 1.6S_{DS}I_p = 0.3 \times 0.267 \times 1.5 = 0.120$ (13.3-3 ASCE 7-10)
t) Assume $C_S = C_{S\ min} = 0.120$; $F_p = 0.12\ W_p = 0.12D$ Assume **E = 0.12D**
u) Live Load **L=75 psf** [Table 1607.1(13)NYC BC 2014, mechanical and electrical equipment]
v) Assume **E** = **0.12D**; **L=75 psf** for ASD NYS BC 2007 Critical Load Combinations.
w) ASD most applicable Critical Load Combinations (1605.3.1 NYS BC 2007):

Prescribed	Applicable	Equation
D	D	[Eq. 16-7 NYS BC]
D + L	D + L	[Eq. 16-8 NYS BC]
D + (W or 0.7E) + L + (L_R or S or R)	D + 0.7E + L	[Eq. 16-10 NYS BC]
0.6D + 0.7E	0.6D + 0.7E	[Eq. 16-12 NYS BC]

Abbreviations and Notations used

D = Dead load.
E = Combined effect of earthquake induced forces
F = Load due to fluids with
F_a = Flood load.
H = Load due to lateral earth pressures
L = Live load
R = Rain load.
S = Snow load.
T = Self-straining force (contraction or expansion)
W = Load due to wind pressure.

By inspection, FINALLY assumed: the most critical is Eq. 12-10 ASD NYS BC 2007:
$D + 0.7E + L = D + E_V + E_H + L =$ $\mathbf{D + 0.12D_V + 0.12D_H + L}$

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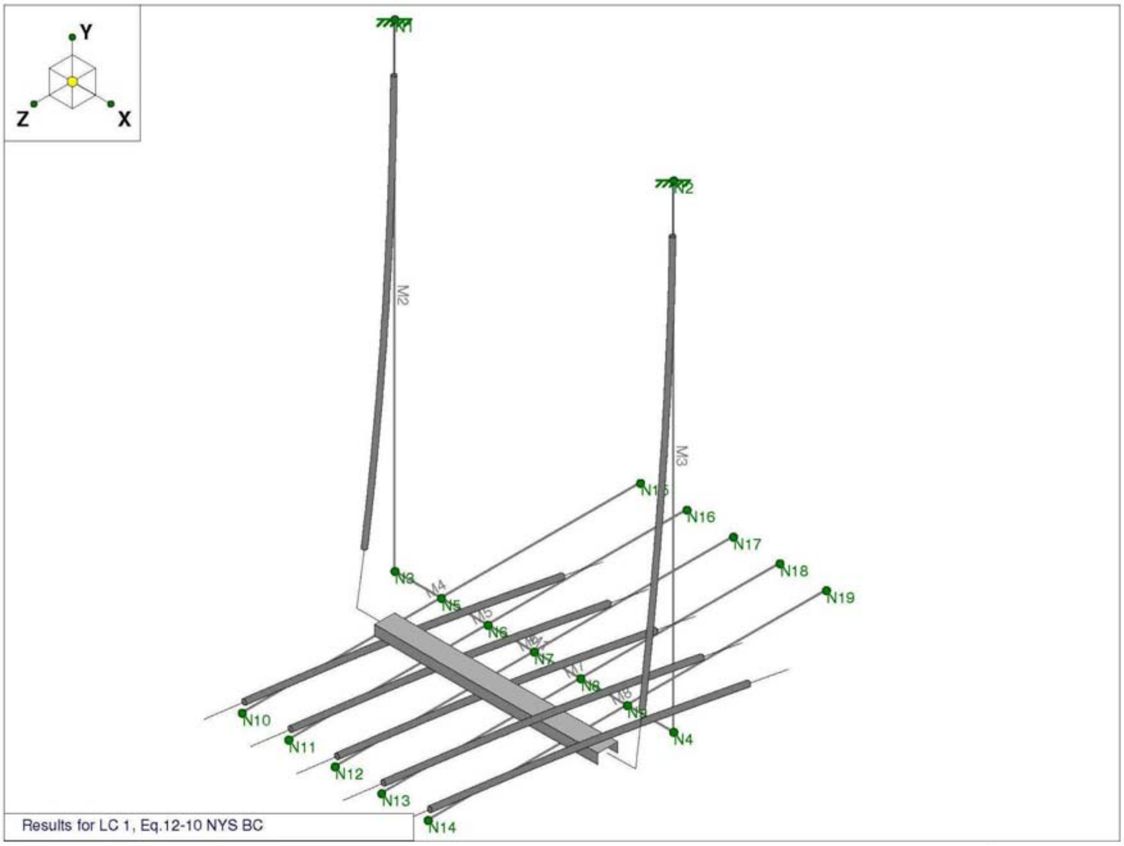
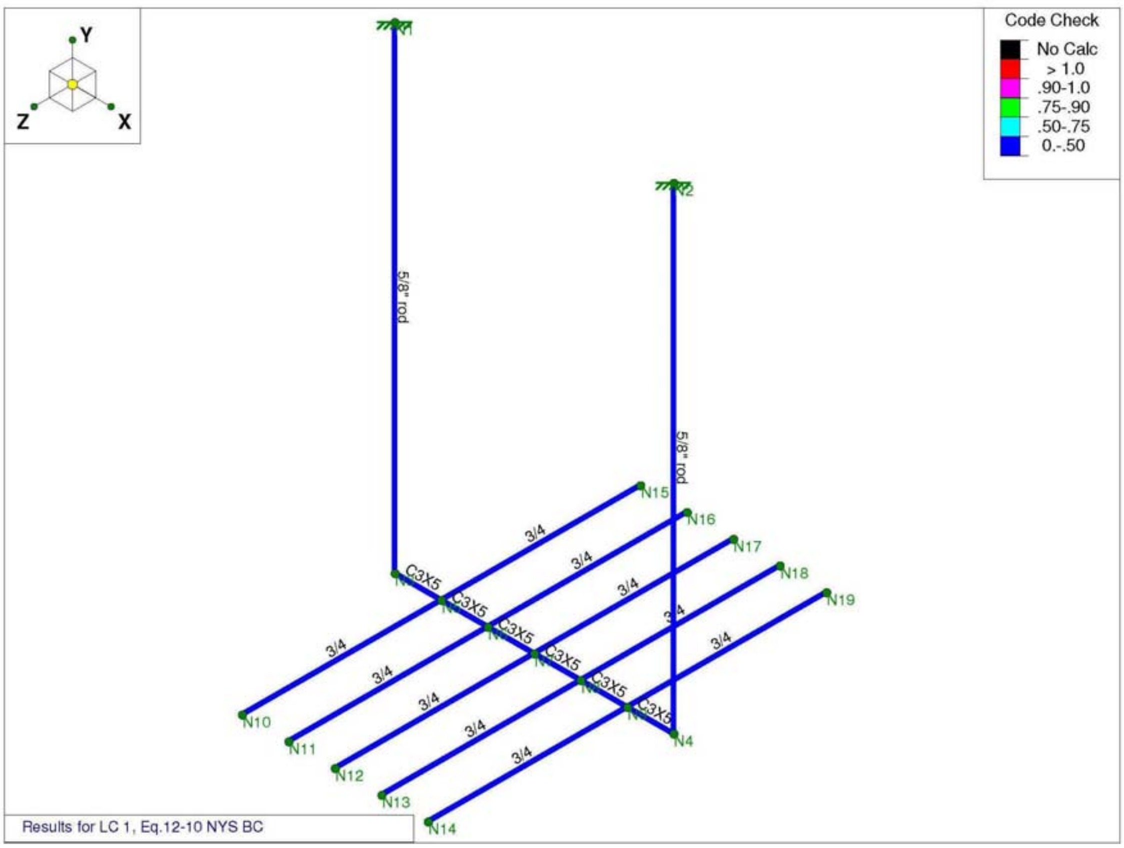
III. RISA 3D Structural Analysis





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Sections

Section Label	Database Shape	Material Label	Area (in)^2	SA(yy)	SA(zz)	I y-y (in^4)	I z-z (in^4)	J (Torsion) (in^4)	T/C Only
C-CHANNEL	C3X5	STL	1.47	1.2	1.2	.247	1.85	.04	
ROD	5/8" rod	STL	.358	1.2	1.2	.01	.01	.02	
CABLE	3/4	STL	.442	1.2	1.2	.016	.016	.031	

Basic Load Case Data

BLC No.	Basic Load Case Description	Category Code	Category Description	Gravity X	Gravity Y	Gravity Z	Load Type Totals Joint	Point	Direct Dist.	Area	Surf.
1	D	DL	Dead Load		-1						
2	E horizontal X	ELX	Earthquake Load X	1							
3	E vertical Y	ELY	Earthquake Load Y		1						
4	E horizontal Z	ELZ	Earthquake Load Z			1					
5	L	LL	Live Load						8		

Load Combinations

Num	Description	Env	WS	PD	SRSS	CD	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	Eq.12-10 NYS BC	y	y			1	DL	1	ELX	.12	ELY	.12	ELZ	.12
							LL	1						

Member AISC ASD 9th Code Checks, By Combination

LC	Member Label	Code Chk	Loc (in)	Shear Chk	Loc (in)	Dir	ASD Eqn.	Message
1	M1	.157	21	.009	0	z	H2-1	
1	M2	.304	0	.001	0		H2-1	
1	M3	.286	0	.001	0		H2-1	
1	M4	.184	30	.003	30		H1-2	
1	M5	.184	30	.003	30		H1-2	
1	M6	.184	30	.003	30		H1-2	
1	M7	.184	30	.003	30		H1-2	
1	M8	.184	30	.003	30		H1-2	

Reactions, By Combination

LC	Joint Label	X Force (k)	Y Force (k)	Z Force (k)	X Moment (k-ft)	Y Moment (k-ft)	Z Moment (k-ft)
1	N1	-.005	.158	-.004	.022	0	-.013
1	N2	-.003	.146	-.004	.022	0	-.01
1	Totals:	-.008	.304	-.008			
1	COG (in):	X: 21	Y: 10.038	Z: 0			

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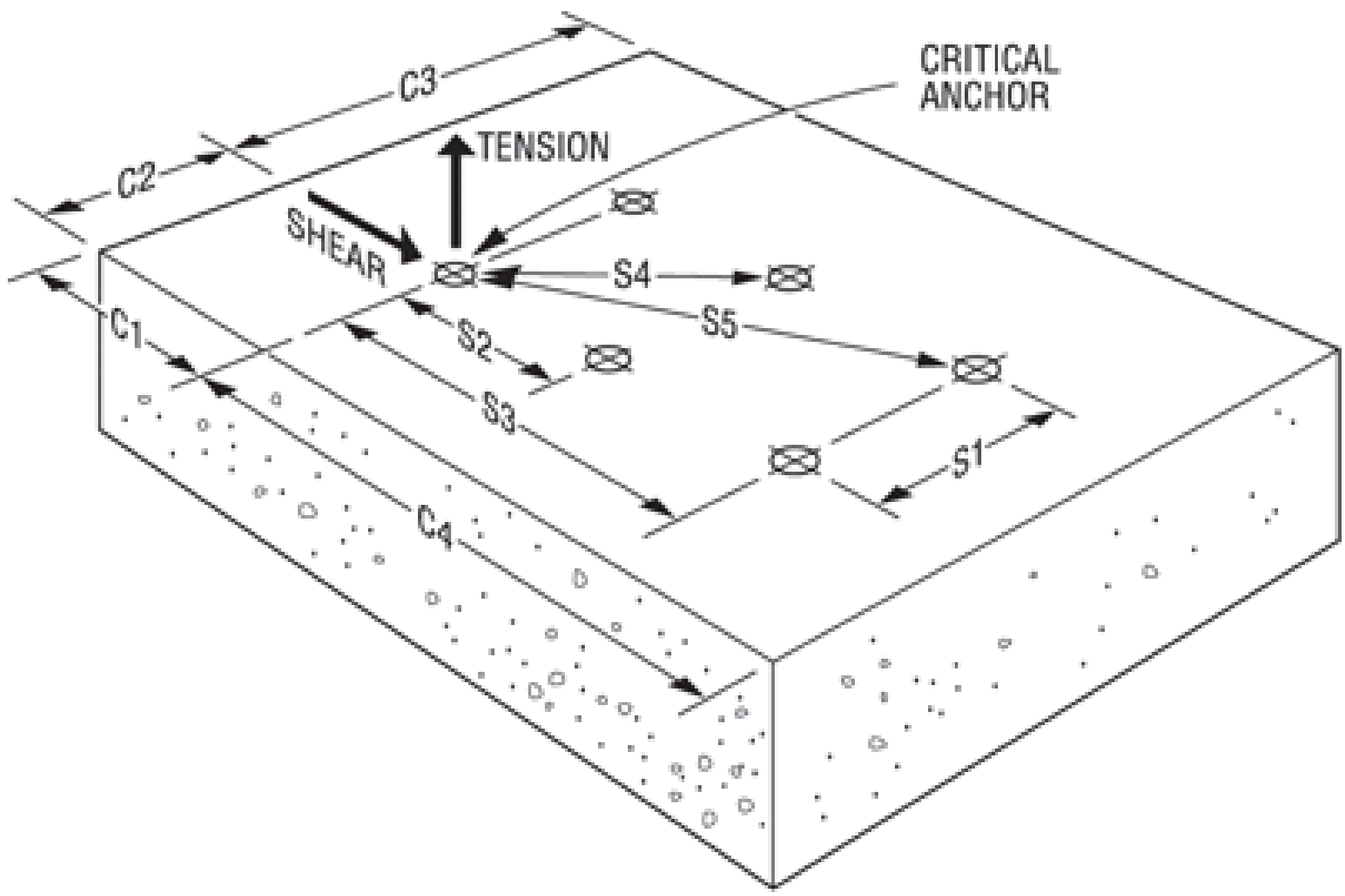
IV. Anchor Structural Analysis

GIVEN:
Base Material Type: Normal Weight Concrete
Base Material Mechanical Properties: f'c = 4000 psi or higher
Minimum Base Material Thickness = 12 inches
Applied Tension Load per Anchor: Tapplied = 160 lb.
Applied Shear Load per Anchor: Vapplied = 5 lb.

Anchor Spacing:
S1 = NA
S2 = NA
S3 = 42 inches
S4 = NA
S5 = NA

Anchor Edge Distance:
C1 = 100 inches
C2 = 100 inches
C3 = 100 inches
C4 = 100 inches



OPTION 1
Proposed Anchor System = Titen HD
Anchor Diameter (in.) or Rebar Size = 5/8
Embedment Depth = 2 3/4 inches
Allowable Tension: T = 1645 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.79 + [(1 - 0.79)x(42 - 2.5)/(10 - 2.5)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.67 + [(1 - 0.67)x(100 - 1.75)/(5 - 1.75)] <= 1, fC1 = 1.000
fC2 = 0.67 + [(1 - 0.67)x(100 - 1.75)/(5 - 1.75)] <= 1, fC2 = 1.000
fC3 = 0.67 + [(1 - 0.67)x(100 - 1.75)/(5 - 1.75)] <= 1, fC3 = 1.000
fC4 = 0.67 + [(1 - 0.67)x(100 - 1.75)/(5 - 1.75)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Tdesign is equal to:
Tdesign = 1645 x 1.000 x 1.000 x 1.00 x 1.00 = 1645 lb. >=Tapplied, OK
Allowable Shear: V = 2495 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.77 + [(1 - 0.77)x(42 - 2.5)/(10 - 2.5)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.19 + [(1 - 0.19)x(100 - 1.75)/(7.5 - 1.75)] <= 1, fC1 = 1.000
fC2 = 0.19 + [(1 - 0.19)x(100 - 1.75)/(7.5 - 1.75)] <= 1, fC2 = 1.000
fC3 = 0.19 + [(1 - 0.19)x(100 - 1.75)/(7.5 - 1.75)] <= 1, fC3 = 1.000
fC4 = 0.19 + [(1 - 0.19)x(100 - 1.75)/(7.5 - 1.75)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Allowable Shear Value for Design:
Vdesign is equal to:
Vdesign = 2495 x 1.000 x 1.000 x 1.00 x 1.00 = 2495 lb. >=Vapplied, OK
Check Combined Tension & Shear Interaction:
(Tapplied/Tdesign)^n + (Vapplied/Vdesign)^n < or = 1.0
(160/1645)^1.666667 + (5/2495)^1.666667 = 0.020603 < or = 1.0 OK
Where n = 5/3 for Carbon/Stainless Steel Wedge-All, Titen HD and Carbon/Stainless Steel Drop-In anchors installed in Normal Weight Concrete only. Otherwise, n = 1 for all other cases.

OPTION 2
Proposed Anchor System = Wedge-All (Carbon Steel)
Anchor Diameter (in.) or Rebar Size = 5/8
Embedment Depth = 2 3/4 inches
Allowable Tension: T = 2150 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.43 + [(1 - 0.43)x(42 - 1.375)/(3.875 - 1.375)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC1 = 1.000
fC2 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC2 = 1.000
fC3 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC3 = 1.000
fC4 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Tdesign is equal to:
Tdesign = 2150 x 1.000 x 1.000 x 1.00 x 1.00 = 2150 lb. >=Tapplied, OK
Allowable Shear: V = 2180 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.79 + [(1 - 0.79)x(42 - 1.375)/(3.875 - 1.375)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.3 + [(1 - 0.3)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC1 = 1.000
fC2 = 0.3 + [(1 - 0.3)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC2 = 1.000
fC3 = 0.3 + [(1 - 0.3)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC3 = 1.000
fC4 = 0.3 + [(1 - 0.3)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Allowable Shear Value for Design:
Vdesign is equal to:
Vdesign = 2180 x 1.000 x 1.000 x 1.00 x 1.00 = 2180 lb. >=Vapplied, OK
Check Combined Tension & Shear Interaction:
(Tapplied/Tdesign)^n + (Vapplied/Vdesign)^n < or = 1.0
(160/2150)^1.666667 + (5/2180)^1.666667 = 0.013206 < or = 1.0 OK
Where n = 5/3 for Carbon/Stainless Steel Wedge-All, Titen HD and Carbon/Stainless Steel Drop-In anchors installed in Normal Weight Concrete only. Otherwise, n = 1 for all other cases.

OPTION 3
Proposed Anchor System = Stainless-Steel Wedge-All
Anchor Diameter (in.) or Rebar Size = 5/8
Embedment Depth = 2 3/4 inches
Allowable Tension: T = 1935 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.43 + [(1 - 0.43)x(42 - 1.375)/(3.875 - 1.375)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC1 = 1.000
fC2 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC2 = 1.000
fC3 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC3 = 1.000
fC4 = 0.70 + [(1 - 0.70)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Tdesign is equal to:
Tdesign = 1935 x 1.000 x 1.000 x 1.00 x 1.00 = 1935 lb. >=Tapplied, OK
Allowable Shear: V = 2505 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.79 + [(1 - 0.79)x(42 - 1.375)/(3.875 - 1.375)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.30 + [(1 - 0.30)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC1 = 1.000
fC2 = 0.30 + [(1 - 0.30)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC2 = 1.000
fC3 = 0.30 + [(1 - 0.30)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC3 = 1.000
fC4 = 0.30 + [(1 - 0.30)x(100 - 2.5)/(6.25 - 2.5)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Allowable Shear Value for Design:
Vdesign is equal to:
Vdesign = 2505 x 1.000 x 1.000 x 1.00 x 1.00 = 2505 lb. >=Vapplied, OK
Check Combined Tension & Shear Interaction:
(Tapplied/Tdesign)^n + (Vapplied/Vdesign)^n < or = 1.0
(160/1935)^1.666667 + (5/2505)^1.666667 = 0.015726 < or = 1.0 OK
Where n = 5/3 for Carbon/Stainless Steel Wedge-All, Titen HD and Carbon/Stainless Steel Drop-In anchors installed in Normal Weight Concrete only. Otherwise, n = 1 for all other cases.

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OPTION 4
Proposed Anchor System = Drop-In Anchor
Anchor Diameter (in.) or Rebar Size = 5/8
Embedment Depth = 2 1/2 inches
Allowable Tension: T = 2170 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.50 + [(1 - 0.50)x(42 - 5)/(10 - 5)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.65 + [(1 - 0.65)x(100 - 4.375)/(7.5 - 4.375)] <= 1, fC1 = 1.000
fC2 = 0.65 + [(1 - 0.65)x(100 - 4.375)/(7.5 - 4.375)] <= 1, fC2 = 1.000
fC3 = 0.65 + [(1 - 0.65)x(100 - 4.375)/(7.5 - 4.375)] <= 1, fC3 = 1.000
fC4 = 0.65 + [(1 - 0.65)x(100 - 4.375)/(7.5 - 4.375)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Tdesign is equal to:
Tdesign = 2170 x 1.000 x 1.000 x 1.00 x 1.00 = 2170 lb. >=Tapplied, OK
Allowable Shear: V = 2770 lb.
Reduced Efficiency Based on Spacing:
fS1 = 1 as S1 = NA
fS2 = 1 as S2 = NA
fS3 = 0.50 + [(1 - 0.50)x(42 - 5)/(10 - 5)] <= 1, fS3 = 1.000
fS4 = 1 as S4 = NA
fS5 = 1 as S5 = NA
(fS)tot. = 1.000 x 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Reduced Efficiency Based on Edge/End Distance:
fC1 = 0.45 + [(1 - 0.45)x(100 - 4.375)/(8.75 - 4.375)] <= 1, fC1 = 1.000
fC2 = 0.45 + [(1 - 0.45)x(100 - 4.375)/(8.75 - 4.375)] <= 1, fC2 = 1.000
fC3 = 0.45 + [(1 - 0.45)x(100 - 4.375)/(8.75 - 4.375)] <= 1, fC3 = 1.000
fC4 = 0.45 + [(1 - 0.45)x(100 - 4.375)/(8.75 - 4.375)] <= 1, fC4 = 1.000
(fC)tot. = 1.000 x 1.000 x 1.000 x 1.000 = 1.000
Allowable Shear Value for Design:
Vdesign is equal to:
Vdesign = 2770 x 1.000 x 1.000 x 1.00 x 1.00 = 2770 lb. >=Vapplied, OK
Check Combined Tension & Shear Interaction:
(Tapplied/Tdesign)^n + (Vapplied/Vdesign)^n < or = 1.0
(160/2170)^1.666667 + (5/2770)^1.666667 = 0.012992 < or = 1.0 OK
Where n = 5/3 for Carbon/Stainless Steel Wedge-All, Titen HD and Carbon/Stainless Steel Drop-In anchors installed in Normal Weight Concrete only. Otherwise, n = 1 for all other cases.

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NEW YORK CITY TRANSIT AUTHORITY
Contract W-32366 700/800 MHZ BUS RADIO SYSTEM

Mast #3
Structural Analysis

Reference Drawing № C-104

Prepared per L.K. Comstock & Co, Inc. Order
659 Rhinelander Ave Bronx NY 10462

Produced by or under direct supervision of Alexey Leonichev, P.E.
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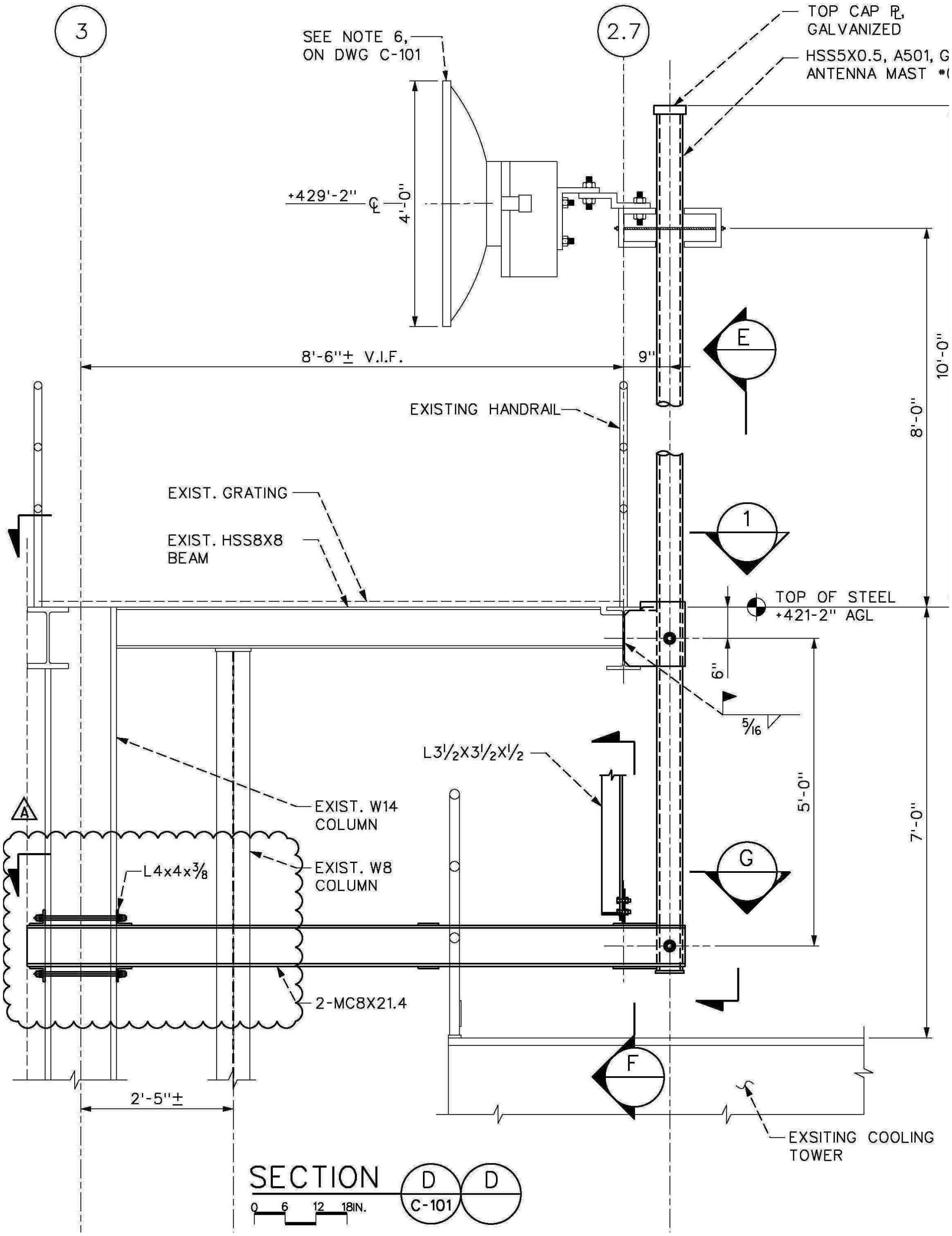
I. Customer-provided Design Task and Data

a) Perform Structural Analysis of Proposed Antenna Mast #1 as shown on the NYC TA – Parsons Drawings C103 – First General Revision A of 03/17/17, Contract W-32366 700/800 MHz Bus Radio System. Address: 2 Broadway New York NY 10004, Coordinates: 40°42′17″N 74°00′48″W Height = 421ft, 32 Floors. Antenna Elevation = 437'-4" ≈ 437'. Existing Structure is structurally sound, in full compliance with all Codes and Regulations and therefore able to withstand against all currently superimposed loads.



b) Utilize governing design provisions: (1) TIA-222-G-2; (2) NYC BC 2014; (3) ASCE 7-05
c) Structural Design Criteria:
1) Basic wind speed (no ice) = 110 mph
2) Basic wind speed (with ice) = 50 mph
3) Design ice thickness = 0.75"
4) Structure class III (due to height, use, location represent high hazard, table 2.1 TIA-222-G-2)
5) Wind exposure category C (open terrain with scattered obstructions, 2.6.5.1 TIA-222-G-2)
6) Wind topographic category 1 (no abrupt topography changes, 2.6.6.2 TIA-222-G-2)
7) Maximum wind pressure 58 psf
8) Seismic Importance Factor I = 1.5
9) $S_s = 0.43g$; $S_s = 0.095g$ [Fig.1615(2)TIA-222-G-2]
10) $F_a = 1.0$
11) R = 1.5
12) Nonstructural $I_p = 1.0$.
13) $a_p = 2.5$ (table 13.5-1 ASCE 7-10) as for signs and billboards
14) $R_p = 3.0$ (table 13.5-1 ASCE 7-10)

II. TIA-222-G-2, NYC BC 2014 and ASCE 7-10 prescribed Design Data

a) Strength Limit State Load Combinations (2.3.2 TIA-222-G-2)

Prescribed	Applicable & Assumed	Equation
$1.2D + 1.0D_g + 1.6W_0$	$1.2D + 1.6W_0$	[Eq. 1]
$0.9D + 1.0 D_g + 1.6 W_0$		[Eq. 2]
$1.2D + 1.0D_g + 1.0 D_i + 1.0W_i + 1.0T_i$	$1.2D + 1.0 D_i + 1.0W_i$	[Eq. 3]
$1.2 D + 1.0 D_g + 1.0E$	$1.2 D + 1.0E$	[Eq. 4]
$0.9 D + 1.0 D_g + 1.0E$		[Eq. 5]

By inspection, FINALLY assumed critical Load Combinations:

1) $1.2D + 1.6W_0$ [2.3.2 TIA-222-G-2 Eq. 1]
2) $1.2D + 1.0 D_i + 1.0W_i$ [2.3.2 TIA-222-G-2 Eq. 3]
3) $1.2 D + 1.0E$ [2.3.2 TIA-222-G-2 Eq. 4]

Symbols and Notation
D = dead load of structure and appurtenances, excluding guy assemblies;
D_g = dead load of guy assemblies;
D_i = weight of ice due to factored ice thickness;
E = earthquake load;
T_i = load effects due to temperature;
W_0 = wind load without ice;
W_i = concurrent wind load with factored ice thickness

III. Design Wind and Ice Loads Determination:

1) Wind Importance Factor without ice $I_W = 1.15$ (for category III, table 2-3 TIA-222-G-2)
2) Wind Importance Factor with ice $I_{Wi} = 1.00$ (for category III, table 2-3 TIA-222-G-2)
3) $Z_g = 900'$, $\alpha = 9.5$ (for exposure C, table 2-4 TIA-222-G-2)
4) $K_{zMin} = 0.85$; $K_{zMin} = 1.00$ (for exposure C, table 2-4 TIA-222-G-2)
5) Velocity Pressure coefficient $K_z = 2.01(Z/Z_g)^{2/\alpha} = 2.01x(437/900)^{2/9.5} = 1.718 > K_{zMin}$
6) Topographic Factor $K_{zt} = 1.0$ for Topographic Category 1 (2.6.6.4 TIA-222-G-2)
7) Topographic Factor $K_d = 0.95$ for (Table 2.2 TIA-222-G-2)
8) Velocity Pressure without ice $q_z=0.00256K_zK_zK_dV^2=0.00256x1.718x1x0.95x110^2$ =50,6 lb/ft^2
9) Velocity Pressure with ice $q_{zi}=0.00256K_zK_zK_dV^2=0.00256x1.718x1x0.95x50^2$ = 10,5 lb/ft^2
10) Gust effect factor $G_h = 1.35$ for structure supported by other (2.6.7.4 TIA-222-G-2)
11) Design Wind Load without ice $F_{st} = q_zG_h(EPA)_{ST}$ = 50,6 x 0.825 x $(EPA)_{ST}$
12) Design Wind Load with ice $F_{ist} = q_{zi}G_h(EPA)_{ST}$ = 10.5 x 0.825 x $(EPA)_{ST}$
13) Design ice thickness Importance Factor I_i= 1.25 (for category III, table 2-3 TIA-222-G-2)
14) Ice thickness height escalation factor $K_{iz}= (z/33)^{0.10} =(437/33)^{0.10} =1.29 \leq 1.4$ (2.6.8 TIA-222-G-2)
15) Elevation adjusted Design ice thickness $t_{iz} = 2t_iI_iK_{iz}(K_{zt})^{0.35}$ = 2x0.75x1.25x1x1.29 = 2.42”
16) Assumed ice unit weight = 56 lb/ft^3 [8.8 kN/m^3]

HSS7x0.5 mast pole

1) HSS7x0.5 largest out-to-out dimension (Fig. 2-2 TIA-222-G-2), D_c= 9.90”
2) HSS7x0.5 effective projected area without ice $(EPA)_{ST}$ = (9.9/12) x 1 = 0.825 ft^2/ft
3) HSS7x0.5 **wind load without ice** F_{st} = 50.6 x 0.825 x 1.35 = **56.36 lb/ft**
4) HSS7x0.5 effective projected area with ice $(EPA)_{iST}$ = (14.74/12) x 1 = 1.23 ft^2/ft
5) HSS7x0.5 **wind load with ice** F_{ist} = 10.5 x 1.228 x 1.35 =**17.41 lb/ft**
6) HSS7x0.5 Cross-sectional area of ice at height z, $A_{iz} = \pi\ t_{iz} (D_C + t_{iz})= 2.42\pi(9.9+2.42)=93.66$ in^2
7) HSS7x0.5 **ice gravity load** = 56 lb/ft^3 x (93.66 in^2 / 144) = 36.42 lb/ft ≈ **35 lb/ft** assumed

Antenna UHX4-107

8) UHX4-107 diameter D_c= 4’
9) UHX4-107 effective projected area without ice $(EPA)_{ST} = \pi 2^2 = 12.57$ ft^2
10) UHX4-107 **wind load without ice** F_{st}=50.6x12.57x1.35x1.5508 = **<u>1331.2 lb > 634 lb allowable</u>**
11) UHX4-107 effective projected area with ice $(EPA)_{iST} = \pi(2+2.42/12)^2 = 15.23$ ft^2
12) UHX4-107 **wind load with ice** F_{ist}=10.5x15.23x1.35x1.5508=**334.86 lb** < 634 lb allowable, OK
13) UHX4-107 Volume of ice, V_{iz} = (2.42/12) x 15.23 ft^2 = 3.07 ft^3
14) UHX4-107 **ice gravity load** = 56 lb/ft^3 x 3.07 ft^3 = **172.00 lb**

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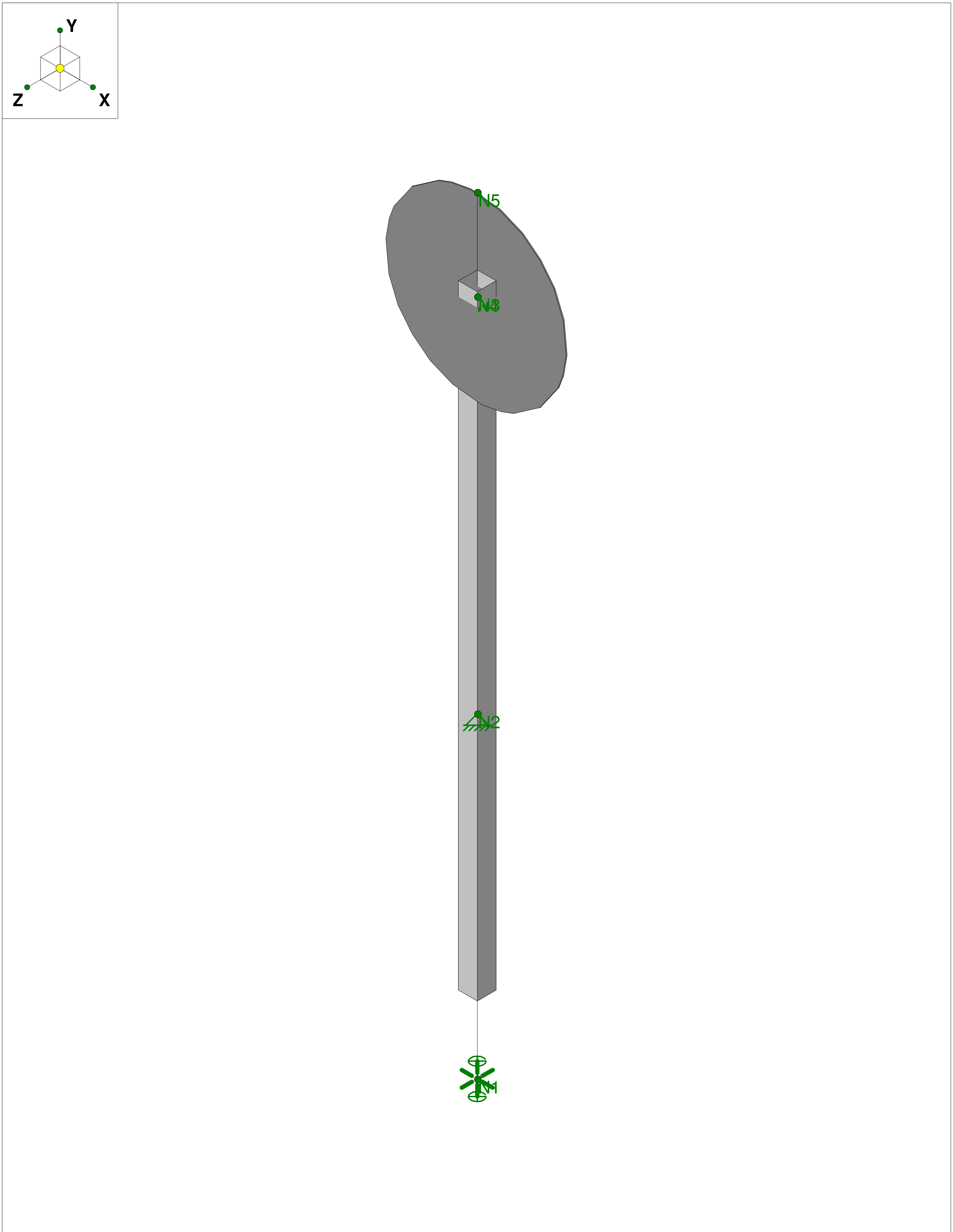
IV. Design Seismic Loads Determination

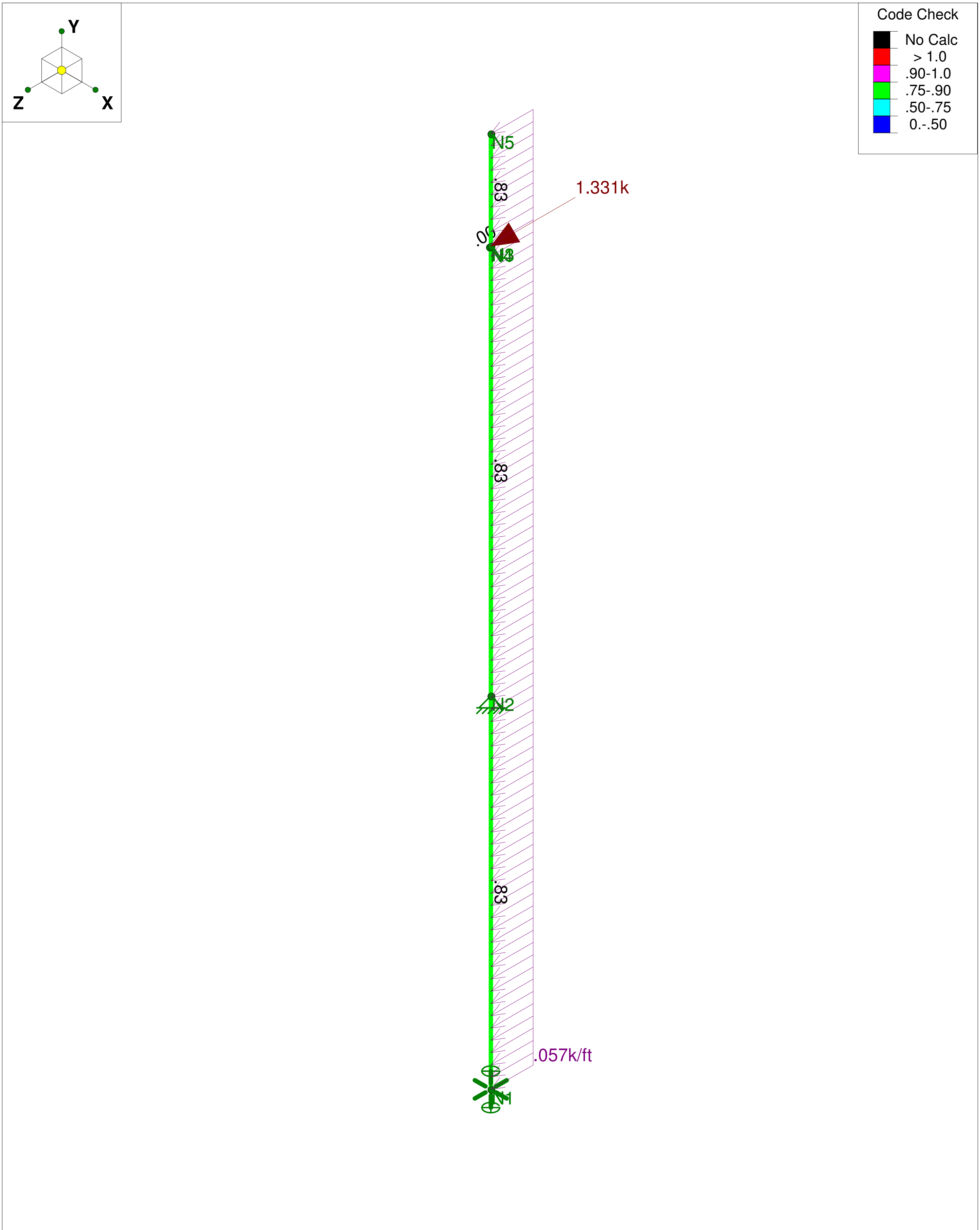
a) Assume Site Class D (soils properties not known, 20.1 ASCE 7-10)
b) S_s = 0.43g; S_1 = 0.095g [Annex B & Fig.1615(2)TIA-222-G-2]
c) Site Coefficient F_a = 1.4 (Table 2-12 TIA-222-G-2)
d) Site Coefficient F_v = 2.4 (Table 2-13 TIA-222-G-2)
e) $S_{MS} = F_a * S_s =$ 1.400 * 0.430 = 0.602 (2.7.6 TIA-222-G-2)
f) $S_{M1} = Fv * S_1 =$ 2.400 * 0.095 = 0.228 (2.7.6 TIA-222-G-2)
g) $S_{DS} = \frac{2}{3} S_{MS} =$ 0.667 * 0.602 = 0.401 (2.7.6 TIA-222-G-2)
h) $S_{D1} = \frac{2}{3} S_{M1} =$ 0.667 * 0.228 = 0.152 (2.7.6 TIA-222-G-2)
i) Component amplification factor a_p = 2.5 (Table 13.5-1 ASCE 7-10) as for signs and billboards
j) Component amplification factor R_p = 3.0 (Table 13.5-1 ASCE 7-10) as for signs and billboards
k) Component importance factor I_p = 1.5
l) Seismic Design Coefficient $C_S = (S_{DS} I_p)/R_p = (0.401x1.5)/3 = 0.2$
m) Assume C_S = 0.2; $F_p = 0.2\ W_p = 0.2D$ Assume **E = 0.2D**

V. RISA 3D Structural Analysis

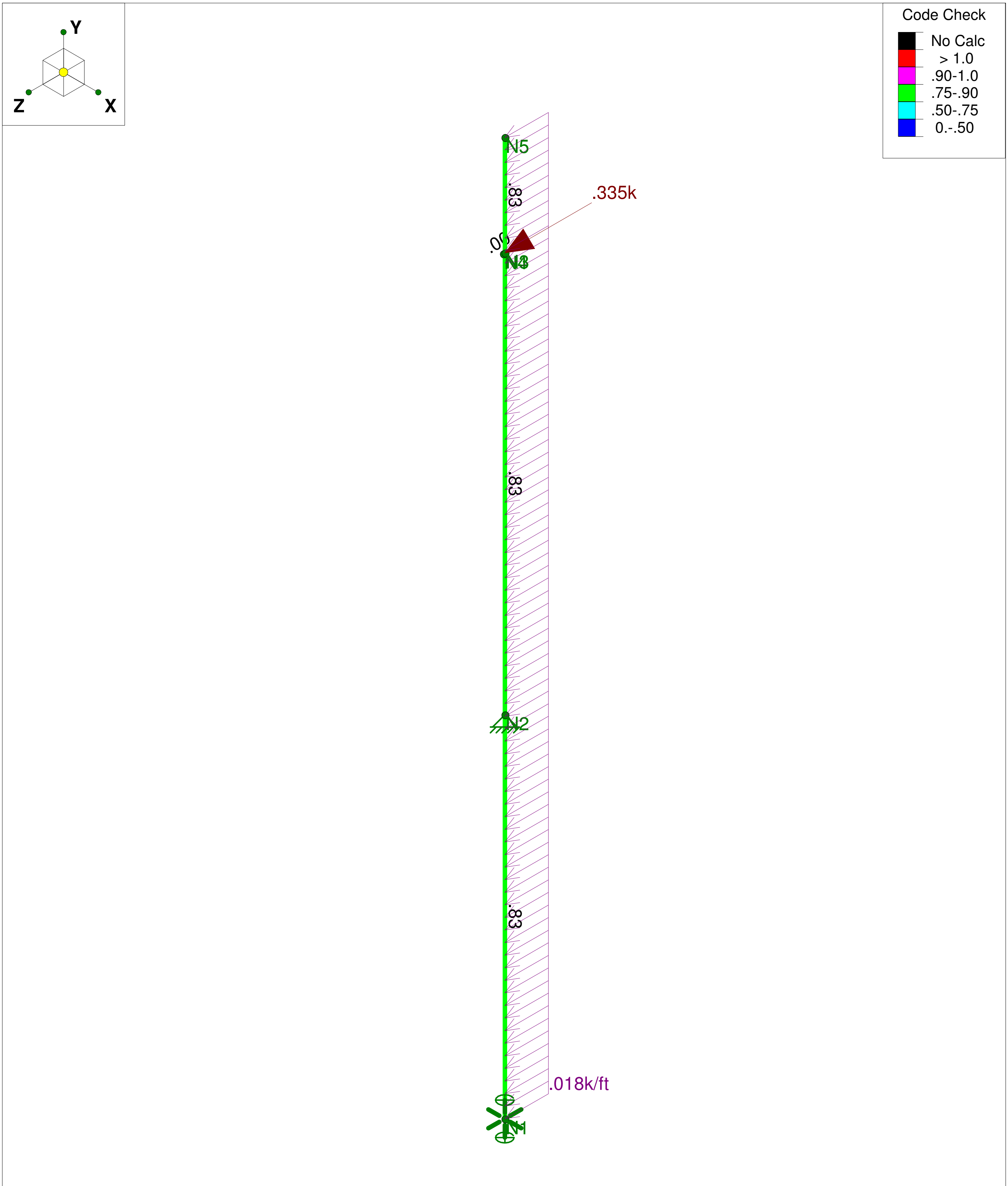
(See next pages)



Results for LC 1, TIA-222-G-2 (1)



Member Code Checks Displayed
Loads: BLC 5, Wind Z
Results for LC 1, TIA-222-G-2 (1)



Member Code Checks Displayed
Loads: BLC 7, Wind on Ice
Results for LC 1, TIA-222-G-2 (1)

Member AISC ASD 9th Code Checks, By Combination

LC	Member Label	Code Chk	Loc (in)	Shear Chk	Loc (in)	Dir	ASD Eqn.	Message
1	M3	.826	85	.044	82.875	z	H1-2	
2	M3	.139	85	.007	82.875	z	H1-2	
3	M3	.025	85	.001	82.875	z	H1-1	

Reactions, By Combination

LC	Joint Label	X Force (k)	Y Force (k)	Z Force (k)	X Moment (k-ft)	Y Moment (k-ft)	Z Moment (k-ft)
1	N2	0	.668	-6.457	0	0	0
1	N1	0	.113	2.777	0	0	0
1	Totals:	0	.781	-3.68			
1	COG (in):	X: 0	Y: 41.373	Z: .057			
2	N2	0	.668	-1.092	0	0	0
2	N1	0	.113	.451	0	0	0
2	Totals:	0	.781	-.641			
2	COG (in):	X: 0	Y: 41.373	Z: .057			
3	N2	0	.668	-.195	0	0	0
3	N1	0	.113	.065	0	0	0
3	Totals:	0	.781	-.13			
3	COG (in):	X: 0	Y: 41.373	Z: .057			

Basic Load Case Data

BLC No.	Basic Load Case Description	Category Code	Category Description	Gravity X	Gravity Y	Gravity Z	Load Type Totals Joint	Point	Direct Dist.	Area	Surf.
1	D	DL	Dead Load		-1						
2	E horizontal X	ELX	Earthquake Load X	.2							
3	E vertical Y	ELY	Earthquake Load Y		-.2						
4	E horizontal Z	ELZ	Earthquake Load Z			.2					
5	Wind Z	WLZ	Wind Load Z				1		1		
6	Ice Gravity	SLN	Snow Load Nonshedding				1		1		
7	Wind on Ice	WL+Z	Wind Load +Z				1		1		

Load Combinations

Num	Description	Env	WS	PD	SRSS	CD	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	TIA-222-G-2 (1)	y		y		1	DL	1.2	WLZ	1.6				
2	TIA-222-G-2 (2)	y		y		1	DL	1.2	SL	1	WL+Z	1		
3	TIA-222-G-2 (3)	y		y		1	DL	1.2	ELZ	1				

Joint Coordinates

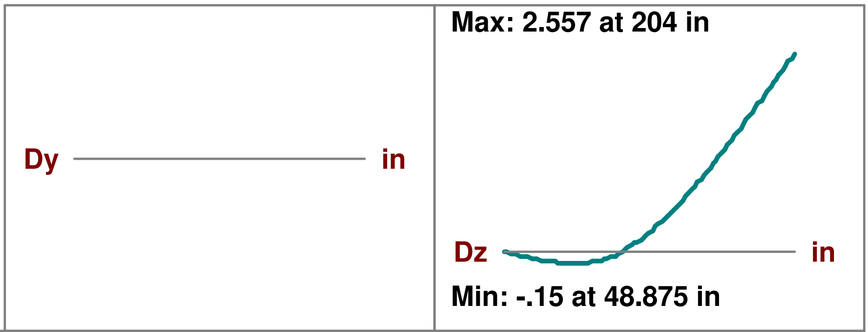
Joint Label	X Coordinate (in)	Y Coordinate (in)	Z Coordinate (in)	Joint Temperature (F)	Detach from Diaphragm
N1	0	-84	0	0	No
N2	0	0	0	0	No
N3	0	96	0	0	No
N4	0	96	.38	0	No
N5	0	120	0	0	No

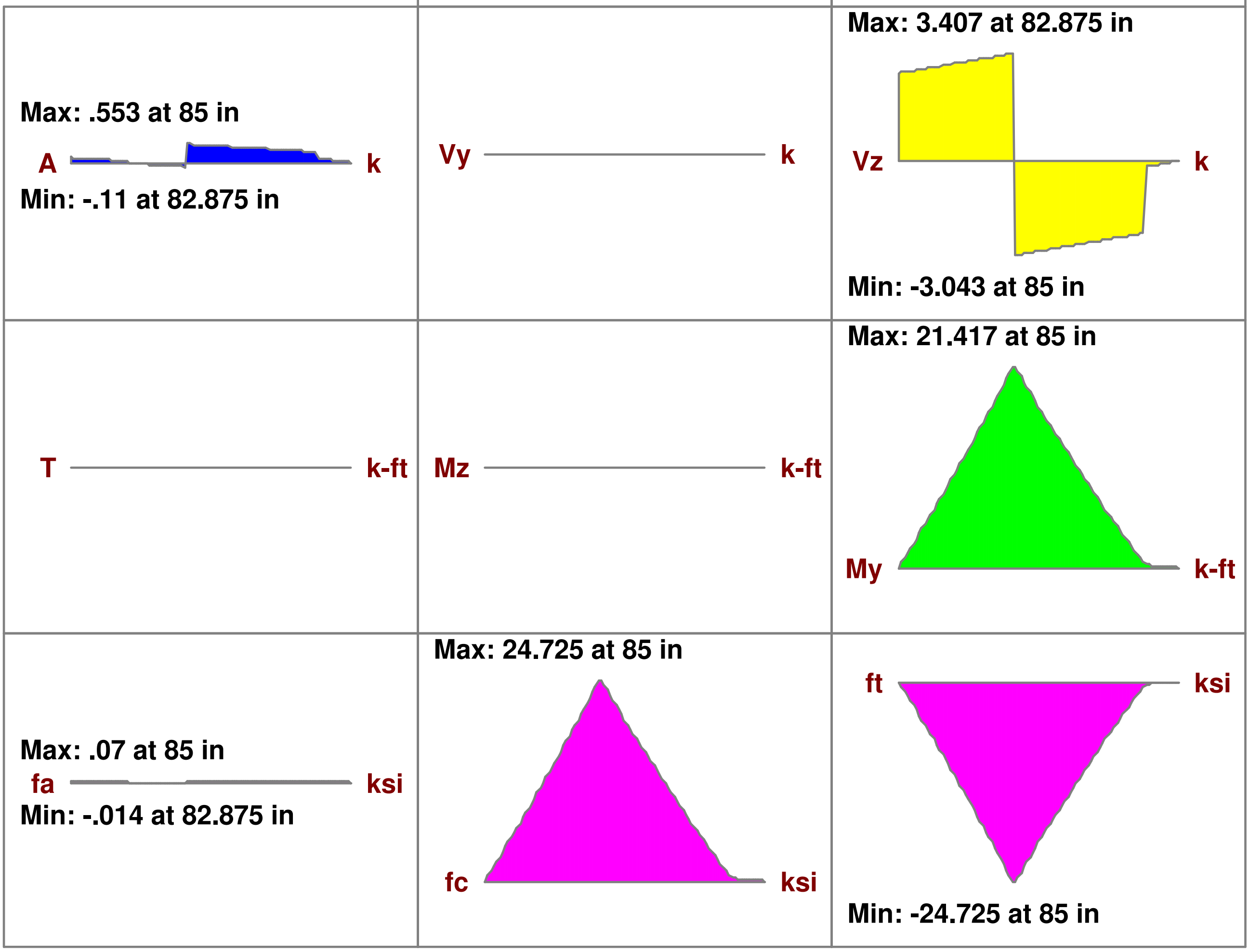
Member: ***M3***

Shape: **HSS5X5X8**
Length: **204 in**
I Joint: **N1**
J Joint: **N5**

LC 1: TIA-222-G-2 (1)

Max Code Check: **0.826**





AISC ASD 9th Ed. Code Check

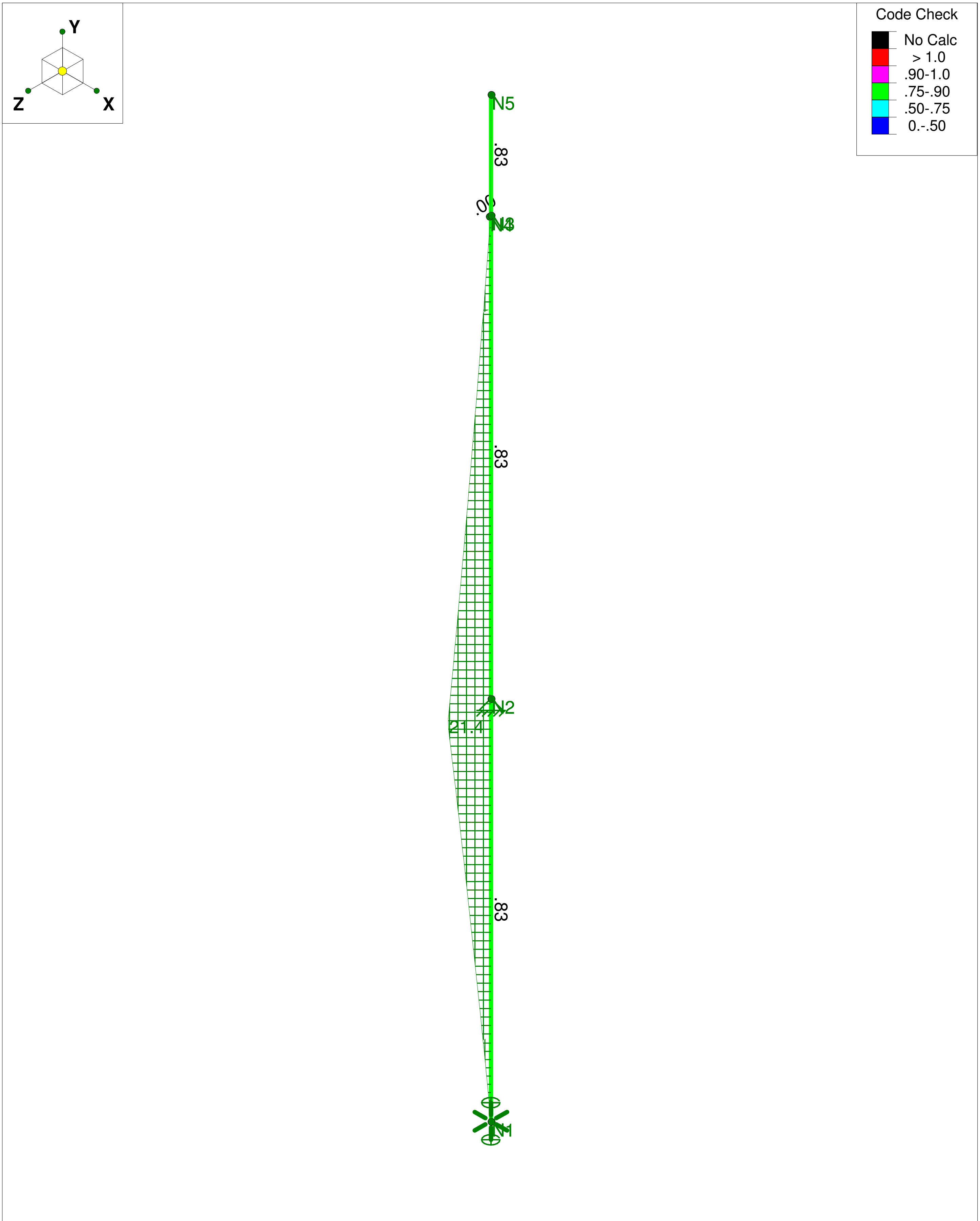
Max Code Check	**0.826**	Max Shear Check	**0.044 (z)**
Location	**85 in**	Location	**82.875 in**
Equation	**H1-2**	Max Defl Ratio	**L/80**

Compact

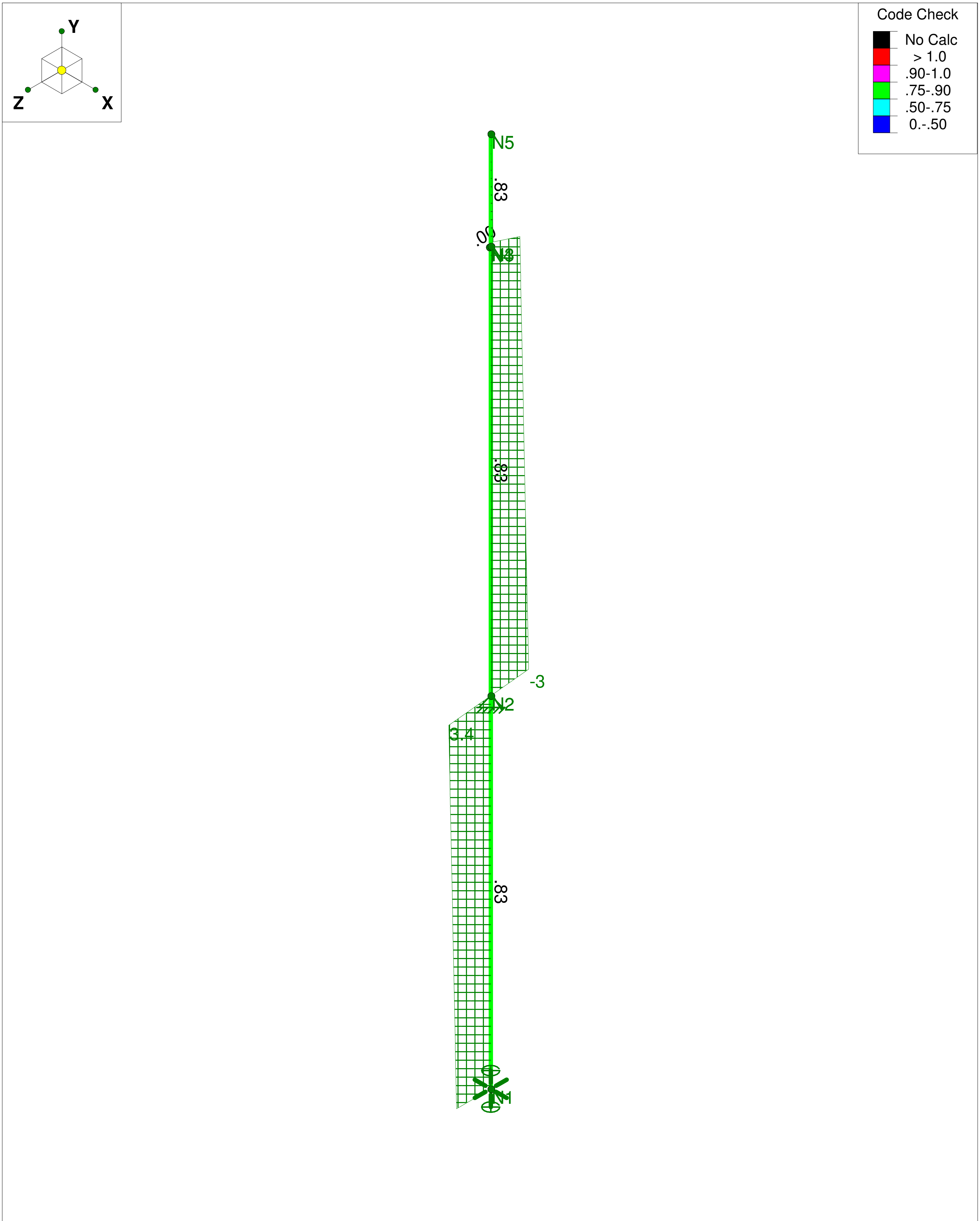
Fy	**50 ksi**
Fa	**11.836 ksi**
Ft	**30 ksi**
Fby	**30 ksi**
Fbz	**30 ksi**
Fvy	**20 ksi**
Fvz	**20 ksi**
Cb	**1**

	Y-Y	Z-Z
Cm	**.85**	**.6**
Lb	**204 in**	**204 in**
KL/r	**112.323**	**112.323**
Sway	**No**	**No**

L Comp Flange	**204 in**
Torque Length	**NC**



Member Code Checks Displayed
Results for LC 1, TIA-222-G-2 (1)
Member y Bending Moments (k-ft)



Member Code Checks Displayed
Results for LC 1, TIA-222-G-2 (1)
Member z Shear Forces (k)

NYC DDC Capital Project S216-399A
Selective Demolition of Existing Structures SW Brooklyn Marine Transfer Station
Gravesend Bay, Brooklyn, NY 11214

Vicinity Map and Bird's-eye view

not to scale

ECCC NYS EXEMPTION STATEMENT:

1. TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGEMENT, THESE PLANS AND SPECIFICATIONS ARE EXEMPT FROM THE ENERGY CONSERVATION CODE OF NEW YORK STATE, BECAUSE THE WORK IS NOT PART OF THE SCOPE DESCRIBED IN CHAPTER 1, SECTIONS: 101.2 & 101.4.2.1

Emergency Phone numbers
DOB Brooklyn (718)802-3675
Ambulance (718)597-6100
DOB BEST (212)669-7043
Fire Department (718)965-8300
DOT (718)222-7259
Police 68th Precinct (718)439-4211

Drawing Index

No.	REVISION	BY

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BLOCK:	6943
LOT:	30
MAP:	28c
BLDG HEIGHT:	N/A
BLDG USE:	Manufacturing
ZONE:	M3-1
BIN:	3256841

PROJECT:
Selective Demolition of Existing Structures SW Brooklyn Marine Station Gravesend Bay, Brooklyn, NY

DRAWING TITLE:
Project Title Sheet

SEAL & SIGNATURE:

DRAWN BY: AL
ENGINEERED BY: AL
VERIFIED BY: SJRJR

DWG #: DM-001.00

DATE: 10/03/2014

SHEET: 1 OF 7

Demolition General Notes

1) DEMOLITION AND REMOVALS SHALL INCLUDE FOLLOWING:
   1.1 DEMOLITION AND REMOVAL OF THE ENTIRE CONCRETE FOUNDATION SYSTEM FOR THE PREVIOUS INCINERATOR BUILDING INCLUDING THE SLAB, GRADE BEAMS, TRENCH WALLS & SLAB, SMALL PIT WALLS AND SLAB, PILE CAPS, ASPHALT TOPPINGS, RECEIVING PIT WALLS, ETC., AS SHOWN ON GREELEY AND HANSEN DRAWINGS C-008.00; S-010.00 AND S-011.00, CONTRACTOR ACKNOWLEDGES AND WILL COORDINATE THEIR WORK SEQUENCE AROUND AND FOR THE INSTALLATION BY OTHERS OF THE STEEL TUBE PIPE BRACES SHOWN ON DRAWING S-011.00.
   1.2 DEMOLITION AND REMOVAL OF THE EXISTING MARINE WINCHES, BOLLARDS, CLEATS, ETC., AND FOUNDATIONS ALONG THE EXISTING WATERFRONT BULKHEAD.
   1.3 DEMOLITION & REMOVAL OF THE CONCRETE SLAB STRUCTURE AND TRENCHES ALONG THE EXISTING WATERFRONT BULKHEAD AS SHOWN ON THE GREELEY AND HANSEN DRAWINGS C-008.00.
   1.4 FENDERING SYSTEM WILL BE REMOVED BY OTHERS.

2) ALL DEMOLITION DEBRIS SHALL BE REMOVED, HAULED, AND DISPOSED OF AT AN APPROVED FACILITY. ALL REQUIRED DOCUMENTATION IS TO BE PROVIDED AS NECESSARY. ALL EQUIPMENT IS TO COMPLY WITH LOCAL LAW 77 AS NECESSARY.

3) DEMOLITION AND REMOVALS THAT MAY BE SPECIFIED UNDER OTHER SECTIONS SHALL CONFORM TO REQUIREMENTS OF THE REFERRED SECTION.

4) THE REMOVAL OF ALL EQUIPMENT, PIPING, PUMPS, AND ALL OTHER MATERIALS FROM THE DEMOLITION OF BUILDINGS AND STRUCTURES SHALL, WHEN RELEASED BY THE COMMISSIONER, BECOME CONTRACTOR'S PROPERTY, UNLESS OTHERWISE NOTED. THESE MATERIALS AND DEBRIS SHALL BE DISPOSED OF OFF-SITE AS REQUIRED BY THE CONTRACT DOCUMENTS.

5) CONTRACTOR SHALL OBTAIN ALL REQUIRED PERMITS.

6) DEMOLITION AND REMOVALS WORK SHALL BE PERFORMED BY COMPETENT WORKMEN EXPERIENCED IN THE VARIOUS TYPES OF DEMOLITION AND REMOVALS WORK REQUIRED, AND IT SHALL BE CARRIED THROUGH TO COMPLETION WITH THE PREVENTION OF DAMAGE OR INJURY TO STRUCTURES AND FACILITIES TO REMAIN, CITY EMPLOYEES, WORKERS ON THE SITE, THE PUBLIC AND ADJACENT FEATURES WHICH MIGHT RESULT FROM FALLING DEBRIS OR OTHER CAUSES, AND SO AS NOT TO INTERFERE WITH THE USE OF, AND FREE AND SAFE PASSAGE TO AND FROM, ADJACENT STRUCTURES AND FACILITIES.

7) CONTRACTOR SHALL PROVIDE, ERECT AND MAINTAIN CATCH PLATFORMS, LIGHTS, BARRIERS, WEATHER PROTECTION, WARNING SIGNS AND OTHER ITEMS AS REQUIRED FOR PROPER PROTECTION OF THE PUBLIC, OCCUPANTS OF THE BUILDING, WORKERS ENGAGED IN DEMOLITION OPERATIONS, AND ADJACENT CONSTRUCTION.

8) CONTRACTOR SHALL PROVIDE AND MAINTAIN TEMPORARY PROTECTION OF EXISTING STRUCTURES AND FACILITIES DESIGNATED TO REMAIN WHERE DEMOLITION AND REMOVALS WORK IS BEING DONE, CONNECTIONS MADE, MATERIALS HANDLED OR EQUIPMENT MOVED.

9) CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO CONTROL DUST AS REQUIRED BY SPECIFICATION 02371 DUST, SOIL EROSION AND SEDIMENTATION CONTROL. DUST SHALL BE PREVENTED FROM RISING BY WETTING DEMOLISHED MASONRY, CONCRETE, PLASTER AND SIMILAR DEBRIS, AS APPLICABLE.

10) CONTRACTOR SHALL PROVIDE ADEQUATE FIRE PROTECTION IN ACCORDANCE WITH LOCAL FIRE DEPARTMENT REQUIREMENTS.

11) CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MAKING ALL NECESSARY ARRANGEMENTS AND FOR PERFORMING ALL NECESSARY WORK INVOLVING THE DISCONTINUANCE OR INTERRUPTION OF ALL UTILITIES OR SERVICES.

12) CLOSING OR OBSTRUCTING OF ROADWAYS, SIDEWALKS, AND PASSAGEWAYS ADJACENT TO THE WORK BY THE PLACEMENT OR STORAGE OF MATERIALS WILL NOT BE PERMITTED, AND ALL OPERATIONS SHALL BE CONDUCTED WITH MINIMUM INTERFERENCE TO TRAFFIC.

13) THE WORK SHALL COMPLY WITH THE APPLICABLE PROVISIONS AND RECOMMENDATIONS OF ANSI A10.2, SAFETY CODE FOR BUILDING CONSTRUCTION, ALL GOVERNING CODES AND REGULATIONS

14) CONTRACTOR SHALL MAKE SUCH INVESTIGATIONS, EXPLORATIONS AND PROBES AS ARE NECESSARY TO ASCERTAIN ANY REQUIRED PROTECTIVE MEASURES BEFORE PROCEEDING WITH DEMOLITION AND REMOVALS.

15) HANDLING AND DISPOSAL OF WASTE DEMOLITION AND REMOVALS MATERIALS SHALL CONFORM TO REQUIREMENTS OF SECTION 01733 – CONSTRUCTION WASTE MANAGEMENT OR SECTION 13287 – ENVIRONMENTAL WASTE TRANSPORTATION AND DISPOSITION, AS APPLICABLE.

16) BEFORE COMMENCEMENT OF DEMOLITION AND REMOVALS WORK:
   a) OBTAIN APPROVAL OF REQUIRED WORKING DRAWINGS AND SHOP DRAWINGS INCLUDING PROPOSED METHODS, EQUIPMENT AND SEQUENCES TO BE USED IN THE DEMOLITION AND REMOVALS WORK, AS SPECIFIED, AND RECEIVE PERMISSION OF THE COMMISSIONER TO PROCEED.
   b) LOCATE ALL BENCHMARKS. SUBMIT FIELD SURVEY AND SITE PLAN OF EXISTING BENCHMARKS TO THE COMMISSIONER. PRESERVE BENCHMARKS DURING CONSTRUCTION. SEE CIVIL/SITE WORK DRAWINGS FOR LOCATIONS AND ELEVATIONS OF BENCHMARKS.
   c) VERIFY UTILITY LOCATIONS AND NOTIFY THE COMMISSIONER OF ANY DISCREPANCIES FROM THE LOCATIONS SHOWN ON THE CONTRACT DRAWINGS.
   d) DE-ENERGIZE ELECTRICAL CIRCUITS.
   e) COMPLY WITH CONTRACT REQUIREMENTS REGARDING ENVIRONMENTAL REMEDIATION WORK
   f) EXISTING UTILITY LOCATIONS, SIZES, AND ELEVATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE AND ARE INTENDED ONLY TO INDICATE THE EXISTANCE OF SUCH UTILITIES IN THE AREAS SHOWN. BEFORE PROCEDING WITH THE WORK, THE CONTRACTOR SHALL VERIFY UTILITY LOCATIONS AND NOTIFY THE COMMISSIONER OR ANY DISCREPANCIES.

19) DEMOLITION DEBRIS SHALL BE REMOVED, HAULED, AND DISPOSED OF AT AN APPROVED FACILITY. ALL REQUIRED DOCUMENTATION IS TO BE PROVIDED AS NECESSARY. ALL EQUIPMENT IS TO COMPLY WITH LOCAL LAW 77 AS NECESSARY.

20) OBSTRUCTIONS AND OPENINGS. WHERE A MATERIAL PILE OR OTHER OBSTRUCTION, OR AN EXCAVATION, OPENING, OR OTHER HAZARD IS LOCATED IN OR ADJACENT TO A PUBLIC WAY, SUCH HAZARD SHALL BE INDICATED BY RED FLAGS OR SIGNS DURING DAYLIGHT HOURS, AND BY RED LANTERNS, RED LIGHTS, OIL FLARES, FLASHING BEACONS, LIGHTED SIGNS, OR EQUIVALENT DEVICES FROM SUNSET TO SUNRISE. SUCH WARNING DEVICES SHALL BE LOCATED NO MORE THAN 30 FEET (9144 MM) APART.

21) DANGEROUS AREAS. IN AREAS WHERE SPECIAL DANGER TO THE PUBLIC EXISTS, SUCH AS AT VEHICLE ENTRANCES AND EXITS, HOISTING AREAS, POINTS OF STORAGE OF EXPLOSIVES OR HIGHLY FLAMMABLE MATERIAL, OR DISCHARGE ENDS OF CHUTES, DESCRIPTIVE WARNING SIGNS SHALL BE PROVIDED. SUCH WARNING SIGNS SHALL CONTAIN THE WORD "DANGER" IN PROMINENT LETTERS AND, WHERE IN, OR ADJACENT TO, A PUBLIC WAY, SHALL BE ILLUMINATED FROM SUNSET TO SUNRISE. BARRICADES AND/OR DESIGNATED PERSONNEL SHALL BE PROVIDED TO THE EXTENT NECESSARY TO KEEP THE PUBLIC AWAY FROM SUCH AREAS OR TO GUIDE THEM AROUND THE AREAS.

22) VEHICULAR TRAFFIC. WHENEVER ANY WORK IS BEING PERFORMED OVER, ON, OR IN CLOSE PROXIMITY TO A HIGHWAY, STREET, OR SIMILAR PUBLIC WAY, CONTROL AND PROTECTION OF TRAFFIC SHALL BE PROVIDED BY BARRICADES, SIGNALS, SIGNS, FLAGPERSON, OR OTHER DEVICES, EQUIPMENT, AND PERSONNEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE DEPARTMENT OF TRANSPORTATION.

23) PROTECTION OF SIDES OF EXCAVATIONS. THE SIDES OF ALL EXCAVATIONS, INCLUDING RELATED OR RESULTING EMBANKMENTS, THAT ARE 5 FEET (1524 MM) OR GREATER IN DEPTH OR HEIGHT MEASURED FROM THE LEVEL OF THE ADJACENT GROUND SURFACE TO THE DEEPEST POINT OF THE EXCAVATION, SHALL BE PROTECTED AND MAINTAINED BY SHORING, BRACING, SHEETING, SHEET PILING, OR BY OTHER RETAINING STRUCTURES AS MAY BE NECESSARY TO PREVENT THE SIDES OF THE EXCAVATION FROM CAVING IN BEFORE PERMANENT SUPPORTS ARE PROVIDED. SUCH METHODS OF PROTECTION SHALL BE SUBJECT TO SPECIAL INSPECTION IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 17.

24) PROTECTION OF SIDES OF EXCAVATIONS. THE SIDES OF ALL EXCAVATIONS, INCLUDING RELATED OR RESULTING EMBANKMENTS, THAT ARE 5 FEET (1524 MM) OR GREATER IN DEPTH OR HEIGHT MEASURED FROM THE LEVEL OF THE ADJACENT GROUND SURFACE TO THE DEEPEST POINT OF THE EXCAVATION, SHALL BE PROTECTED BY GUARDRAILS, UNLESS SIDE OF EXCAVATION HAS 3H:1V (18°) SLOPE.

25) ANY PATHWAY SUPERELEVATED MORE THAN 19" SHELL BE SUPPLIED WITH STEP/STEPS AND GUARDRAILS.

26) DUST PRODUCING OPERATIONS SHALL BE WETTED DOWN TO THE EXTENT NECESSARY TO CONTROL THE DUST. CONTRACTOR SHALL UTILIZE A FIRE HYDRANT (UNDER SEPARATE PERMIT) OR WATER TRUCK AS A WATER SUPPLIES MEANS.

27) A SAFETY ZONE PERIMETER CHAIN LINK FENCE MUST BE COVERED BY THE TARP COVER. CONTRACTOR MUST MAINTAIN 10' CLEAR ZONE ALONG THE FENCE.

28) A PROJECT INFORMATION PANEL MUST BE POSTED ON THE FENCE ON EACH PERIMETER FRONTING A PUBLIC THOROUGHFARE. WHERE THE PERIMETER IS MORE THAN 150 FEET IN LA PROJECT INFORMATION PANEL MUST BE POSTED ON THE FENCE ON EACH PERIMETER FRONTING A PUBLIC THOROUGHFARE. WHERE THE PERIMETER IS MORE THAN 150 FEET IN LENGTH, A PROJECT INFORMATION PANEL MUST BE POSTED AT EACH CORNER. THE PANELS MUST BE POSTED ON THE FENCE AT A HEIGHT OF 4 FEET ABOVE THE GROUND, MEASURED FROM THE GROUND TO THE BOTTOM EDGE OF THE PANEL.

29) THE PROJECT INFORMATION PANEL MUST BE 2 FEET 4 INCHES WIDE AND 4 FEET HIGH AND BE CONSTRUCTED OUT OF DURABLE AND WEATHERPROOF MATERIAL SUCH AS VINYL, PLASTIC, OR ALUMINUM; AND FLAME RETARDANT MATERIAL IN ACCORDANCE WITH NFPA 701 OR LISTED UNDER UL 214. THE PROJECT INFORMATION PANEL CONTENT MUST BE WRITTEN IN THE CALIBRI FONT OR SIMILAR SANS SERIF FONT STYLE, WITH LETTERS A MINIMUM OF 1 INCH HIGH, AS MEASURED BY THE UPPER CASE CHARACTER. THE PERMIT MUST BE LAMINATED OR ENCASED IN A PLASTIC COVERING; OR PRINTED DIRECTLY ONTO THE PROJECT INFORMATION PANEL.

30) THE PROJECT INFORMATION PANEL MUST INCLUDE FOLLOWING CONTENT: A) A TITLE LINE STATING "WORK IN PROGRESS: B) ANTICIPATED PROJECT COMPLETION DATE; C) THE CORPORATE NAME, ADDRESS, AND TELEPHONE NUMBER OF THE OWNER OF THE PROPERTY; D) WEBSITE ADDRESS OR PHONE NUMBER TO CONTACT FOR PROJECT INFORMATION; E) THE CORPORATE NAME AND TELEPHONE NUMBER OF THE GENERAL CONTRACTOR, OR FOR A DEMOLITION SITE, THE DEMOLITION CONTRACTOR; F) THE STATEMENT, IN BOTH ENGLISH AND SPANISH, "TO ANONYMOUSLY REPORT UNSAFE CONDITIONS AT THIS WORK SITE, CALL 311." G) A COPY OF THE PRIMARY PROJECT PERMIT, WITH ACCOMPANYING TEXT "TO SEE OTHER PERMITS ISSUED ON THIS PROPERTY, VISIT: WWW.NYC.GOV/BUILDINGS."

31) THE PROJECT INFORMATION PANEL CONTENT MUST BE WRITTEN IN WHITE, ON A BLUE BACKGROUND. COLOR SPECIFICATIONS FOR THE BLUE BACKGROUND TO THE LEFT AND ABOVE OF THE BUILDING IMAGE ARE AS FOLLOWS: PANTONE: 296; RGB: 15, 43, 84 ; CMYK: 100, 88, 38, 35

Special Inspection Notes

1. MECHANICAL DEMOLITION: BC 1704.19 & BC 3306.6
2. STRUCTURAL SAFETY – STRUCTURAL STABILITY: BC 1704.19

ECCCNYS EXEMPT:

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OCCUANT SAFETY NOTES:

1. CONSTRUCTION WORK WILL BE MONDAY THROUGH FRIDAY, EXCEPT LEGAL HOLIDAYS.
2. THE DEMOLITION SITE IS VACANT. THERE WILL BE NO TENANTS DURING DEMOLITION.

Equipment List

(NOTE: EQUIPMENT FOR EXTERIOR USE ONLY)

1. CATERPILLAR 345/320/235 WITH DEMO ATTACHMENTS (ie: GRAPPLE, SHEAR, RAKE, PNEUMATIC HAMMER, ETC).
2. BOBCAT SKID STEER LOADER, MINI-EXCAVATOR
3. CATERPILLAR 963/973 TRACK LOADER.
4. GENIE S-85 MANLIFT
5. BROKK 250 OR SIMILAR
6. HITACHI EX 750 EXCAVATOR
7. CAT 973/963 CRAWLER LOADER
8. CAT 980 WHEEL LOADER
9. Hitachi EX750

Legend

CONCRETE SLAB TO BE REMOVED

BREAKLINE

8' CHAINLINK FENCE W/TRAPS

FIRE HYDRANT

FLAGMAN

PROJECT INFORMATION PANEL & CONSTRUCTION SIGNAGE

24' GATE

No.	REVISION	BY

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NYC DDC Capital Project S216-399A

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60 US Highway 46
Fairfield NJ 07004
Ph (973)882-1132

PRISMATIC DEVELOPMENT CORPORATION Contractors • Builders

OWNER OR OWNER'S AGENT:

NYC Department of Sanitation
Household Special Waste
Drop-Off Site
City of New York, NY

DEMOLITION SUPERINTENDENT:

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CONTACT: ANN MARIE RUSSO
TEL: (718) 978-5600

BLOCK:	6943
LOT:	30
MAP:	28c
BLDG HEIGHT:	N/A
BLDG USE:	Manufacturing
ZONE:	M3-1
BIN:	3256841

PROJECT:

Selective Demolition of Existing Structures SW Brooklyn Marine Station Gravesend Bay, Brooklyn, NY

DRAWING TITLE:

Demolition General Notes and Legend

SEAL & SIGNATURE:

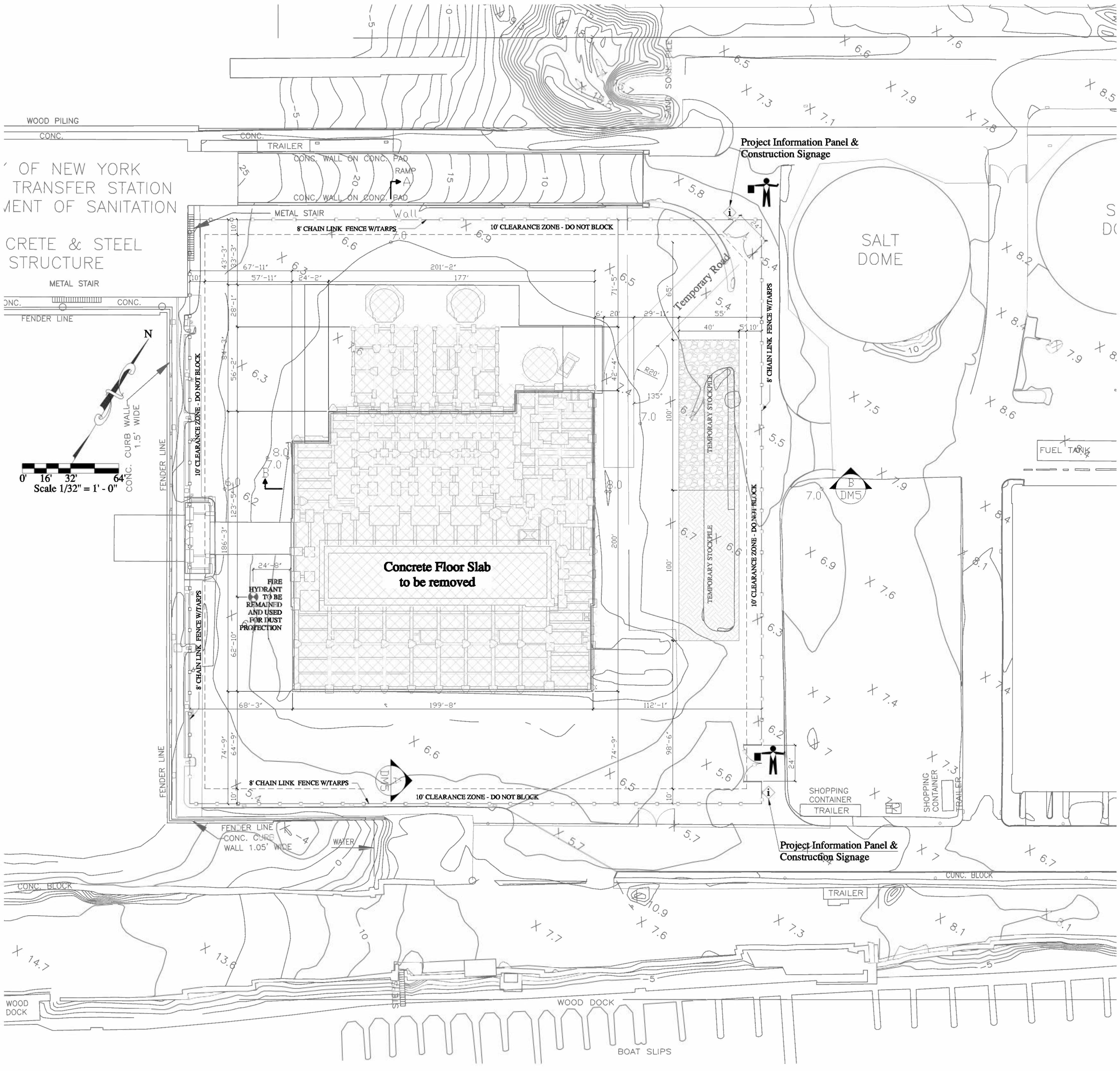
STATE OF NEW YORK • ALEXEY LEONICHEV • 088085 • LICENSED PROFESSIONAL ENGINEER

DRAWN BY: AL
ENGINEERED BY: AL
VERIFIED BY: SJRJR

DWG #: DM-002.00

DATE: 10/03/2014

SHEET: 2 OF 7



Legend

(hatched)	CONCRETE SLAB TO BE REMOVED
(wavy line)	BREAKLINE
(fence line)	8' CHAINLINK FENCE W/TRAPS
(symbol)	FIRE HYDRANT
(symbol)	FLAGMAN
(symbol)	PROJECT INFORMATION PANEL & CONSTRUCTION SIGNAGE
(symbol)	24' GATE

No.	REVISION	BY

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BLOCK:	6943
LOT:	30
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BLDG HEIGHT:	N/A
BLDG USE:	Manufacturing
ZONE:	M3-1
BIN:	3256841

PROJECT:
Selective Demolition of Existing Structures SW Brooklyn Marine Station Gravesend Bay, Brooklyn, NY

DRAWING TITLE:
Demolition Scope of Work and Safety Plan

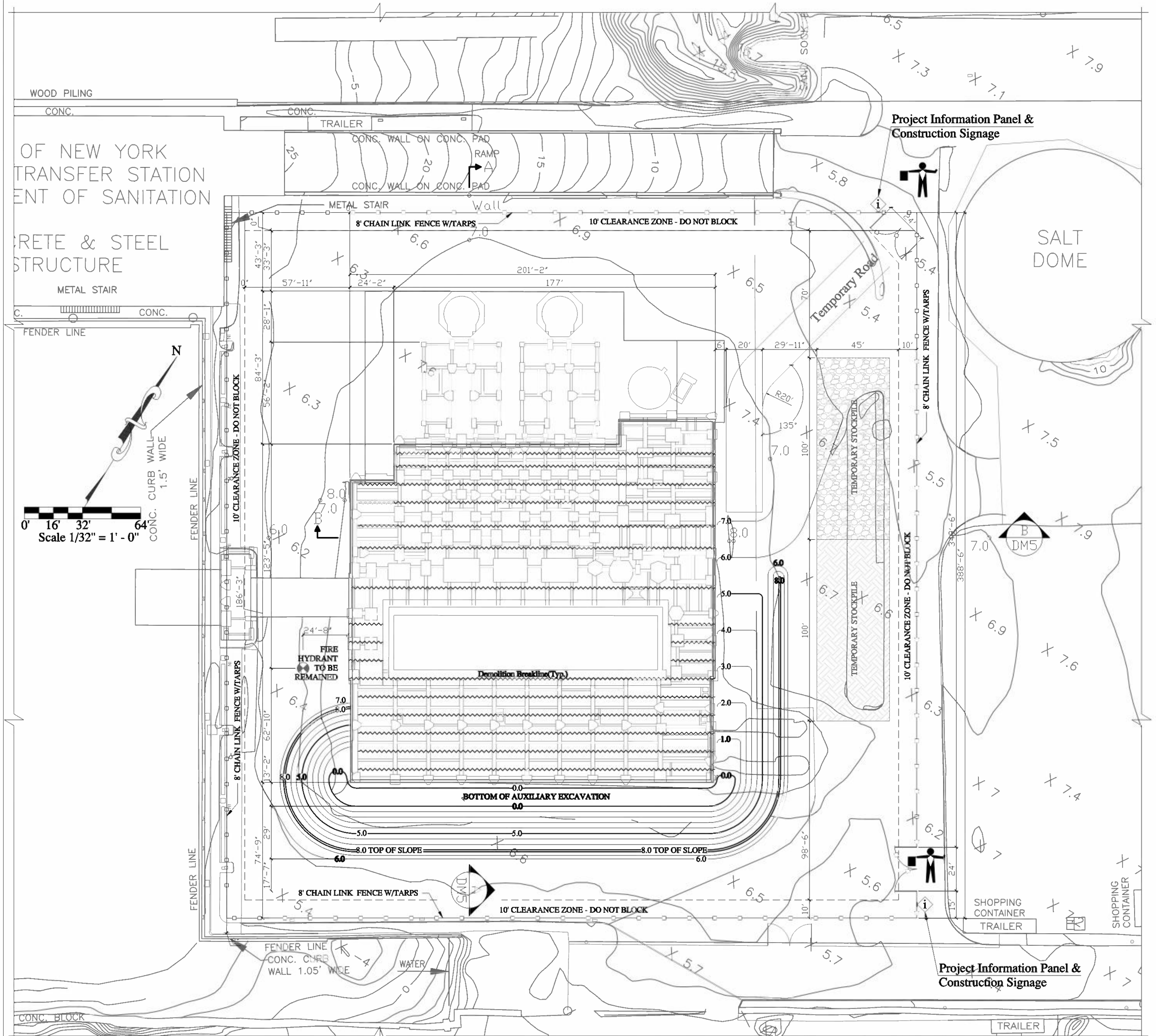
SEAL & SIGNATURE:
STATE OF NEW YORK — ALEXEY LEONICHEV — 088085 — LICENSED PROFESSIONAL ENGINEER

DRAWN BY: AL
ENGINEERED BY: AL
VERIFIED BY: SJRJR

DWG #: DM-003.00

DATE: 10/03/2014

SHEET: 3 OF 7



Demolition Plan

Notes to Contractor

1. THESE PLANS ADDRESS THE DEMOLITION MEANS-AND-METHODS. THE PLANS DO NOT COVER OTHER REQUIREMENTS SUCH AS ASBESTOS REMOVAL, UTILITY CUT-OFFS, ETC.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLYING WITH ALL PERTINENT REGULATIONS GOVERNING DEMOLITION IN NEW YORK CITY, INCLUDING NYC 2008 BC CHAPTER 33 AND OSHA.

3. THE PUBLIC AND ADJOINING PROPERTY SHALL BE PROTECTED BY FENCING AS PER NYC 2008 BC 3306 AND 3307.

4. THE PROPERTY IS NOT LANDMARKED.

5. CONTRACTOR SHALL MAINTAIN A CLEAR PATH OF EGRESS AT ALL TIMES.

6. ALL APPLICABLE/REQUIRED PERMITS TO BE OBTAINED BY CONTRACTOR BEFORE DEMOLITION.

7. NO PERSONNEL WILL BE PERMITTED ON THE DEMOLITION SITE DURING MECHANICAL EQUIPMENT USE, EXCEPT OPERATOR AND AUTHORIZED PERSONNEL.

10. THERE WILL BE NO IMPACT ON ADJACENT PROPERTIES. IF IT BECOMES KNOWN DURING DEMOLITION THAT THERE MAY BE AN IMPACT TO ADJACENT PROPERTIES, THE ENGINEER SHALL BE CONSULTED.

11. NO TREES OUTSIDE THE PROPERTY LINE WITHIN THE PUBLIC RIGHT OF WAY SHALL BE DISTURBED. PROTECTION MEETING THE REQUIREMENTS OF THE DEPARTMENT OF PARKS AND RECREATION SHALL BE PROVIDED AROUND THE TRUNKS OF ALL SUCH TREES, AND WRITTEN NOTIFICATION SHALL ALSO BE MADE TO THE DEPARTMENT OF PARKS AND RECREATION AT LEAST 48 HOURS PRIOR TO COMMENCEMENT OF SUCH WORK.

12. THE SITE IS NOT LOCATED IN THE VICINITY OF AN MTA STRUCTURE. MTA IS APPROVAL IS NOT REQUIRED.

13. WHENEVER ANY KIND OF STRUCTURAL INSTABILITIES ARE OBSERVED, ALL WORKS MUST BE IMMEDIATELY STOPPED AND ENGINEER OF RECORD TO BE NOTIFIED.

14. WHENEVER ANY KIND DISCREPANCIES OF FIELD CONDITIONS WITH THIS DRAWING ARE OBSERVED, ALL WORKS MUST BE IMMEDIATELY STOPPED AND ENGINEER OF RECORD TO BE NOTIFIED.

15. SLAB DEMOLITION OPERATIONS SEQUENCE:
A) AUXILIARY EXCAVATION AND SOIL STOCKPILING AS PER PLAN;
B) BREAK THE SLAB BY MECHANICAL MEANS ALONG THE BREAK LINE AS SHOWN ON THE PLANS;
C) BREAK SUBSTRUCTURE AS SHOWN ON THE PLANS;
D) REMOVE DEBRIS TO THE TEMPORARY STOCKPILE AS PER PLANS;
E) CONTINUE THE SAME FOR THE NEXT BREAK LINE UNTIL FULL COMPLETION;
F) REMOVE TEMPORARY STOCKPILE MATERIAL TO THE PLACE OF UTILIZATION;

Legend

CONCRETE SLAB TO BE REMOVED
BREAKLINE
8' CHAINLINK FENCE W/TRAPS
FIRE HYDRANT
FLAGMAN
PROJECT INFORMATION PANEL & CONSTRUCTION SIGNAGE
24' GATE

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LAWRENCE, NY 11559
CONTACT: ANTHONY RUSSO
TEL: (718) 978-5600

DEMOLITION MANAGER/GENERAL CONTRACTOR

A. RUSSO WRECKING, INC.
67 EAST AVENUE
LAWRENCE, NY 11559
CONTACT: ANN MARIE RUSSO
TEL: (718) 978-5600

BLOCK:	6943
LOT:	30
MAP:	28c
BLDG HEIGHT:	N/A
BLDG USE:	Manufacturing
ZONE:	M3-1
BIN:	3256841

PROJECT:
Selective Demolition of Existing Structures SW Brooklyn Marine Station Gravesend Bay, Brooklyn, NY

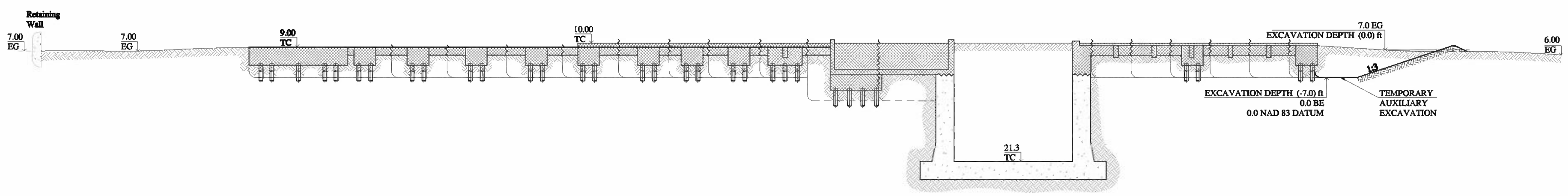
DRAWING TITLE:
Demolition Means and Methods

SEAL & SIGNATURE:
STATE OF NEW YORK · ALEXEY LEONICHEV · 088085 · LICENSED PROFESSIONAL ENGINEER

DRAWN BY: AL
ENGINEERED BY: AL
VERIFIED BY: SJRJR

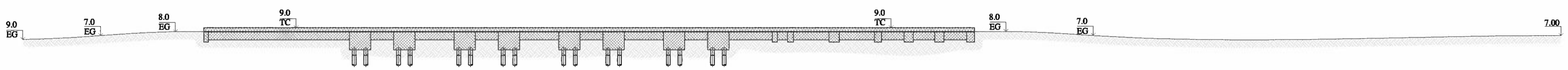
DWG #: DM-004.00

DATE: 10/03/2014
SHEET: 4 OF 7



Section A-A

Scale 1/16" = 1' - 0"
0' 8' 16' 32'



Section B-B

Scale 1/16" = 1' - 0"
0' 8' 16' 32'

LEGEND AND ABBREVIATIONS

(crosshatch)	CONCRETE SLAB TO BE REMOVED	EG	EXISTING GROUND ELEVATION
(stipple)	SOIL	TC	TOP OF CONCRETE
(wavy line)	BREAKLINE	BE	BOTTOM OF EXCAVATION

NOTE

ALL ELEVATIONS SHOWN BASED ON NAD 83 DATUM
AS PER NYC DEPARTMENT OF SANITATION CAPITAL PROJECT S216-399A
PRODUCED BY GREELEY AND HANSEN

No.	REVISION	BY

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DEMOLITION CONTRACTORS
67 EAST AVENUE
LAWRENCE, NY 11559
(718) 978-5600
(516) 239-8823
(516) 239-9324 FAX
www.arussowrecking.com

NYC DDC Capital Project S216-399A

Prepared for Prismatic
Development Corporation
60 US Highway 46
Fairfield NJ 07004
Ph (973)882-1132

OWNER OR OWNER'S AGENT:

NYC Department of Sanitation
Household Special Waste
Drop-Off Site
City of New York, NY

DEMOLITION SUPERINTENDENT:

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67 EAST AVENUE
LAWRENCE, NY 11559

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PROJECT:
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DRAWING TITLE:
Sections

SEAL & SIGNATURE:
STATE OF NEW YORK · ALEXEY LEONICHEV · LICENSED PROFESSIONAL ENGINEER · 088085

DRAWN BY: AL
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VERIFIED BY: SJRJR

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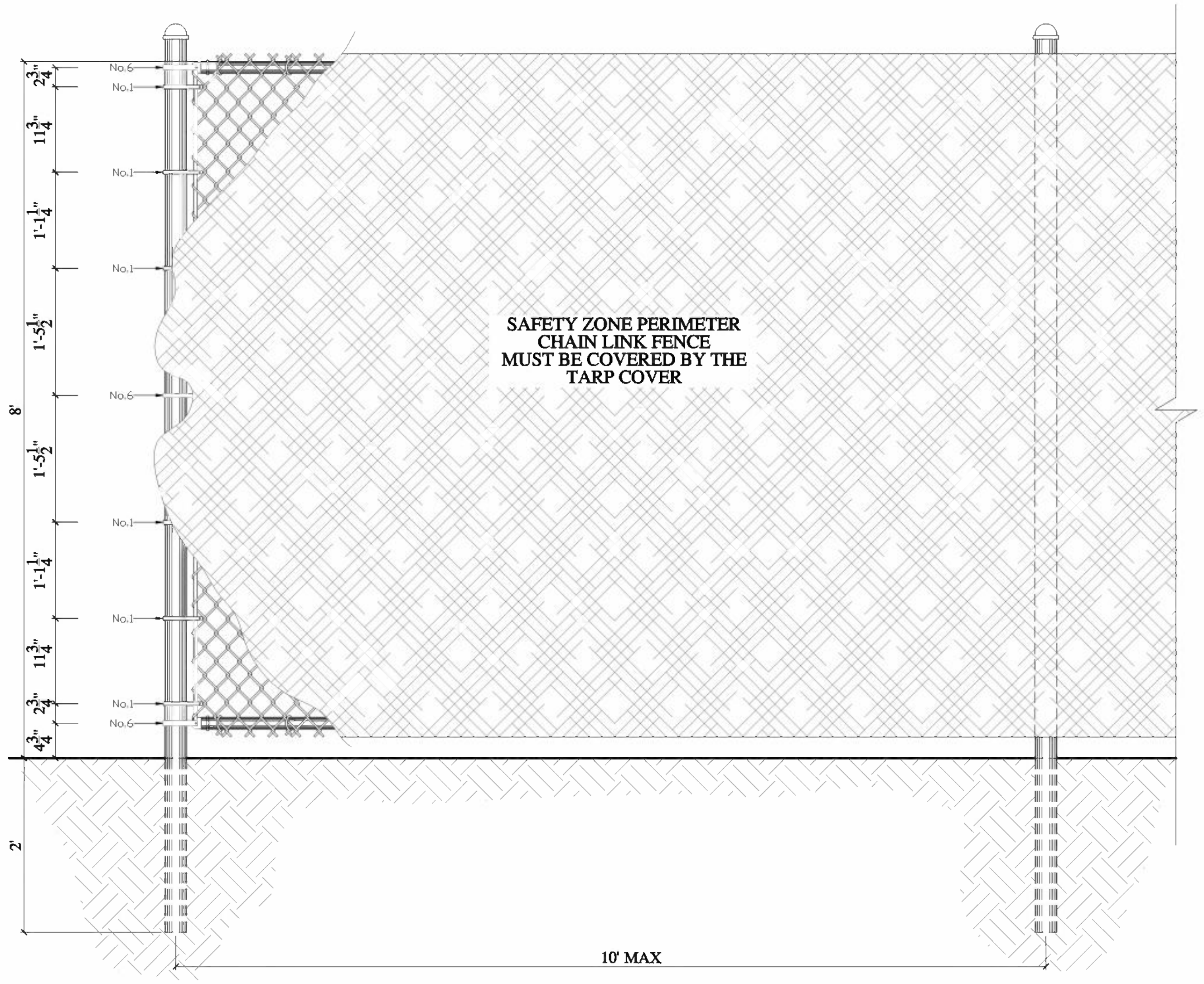
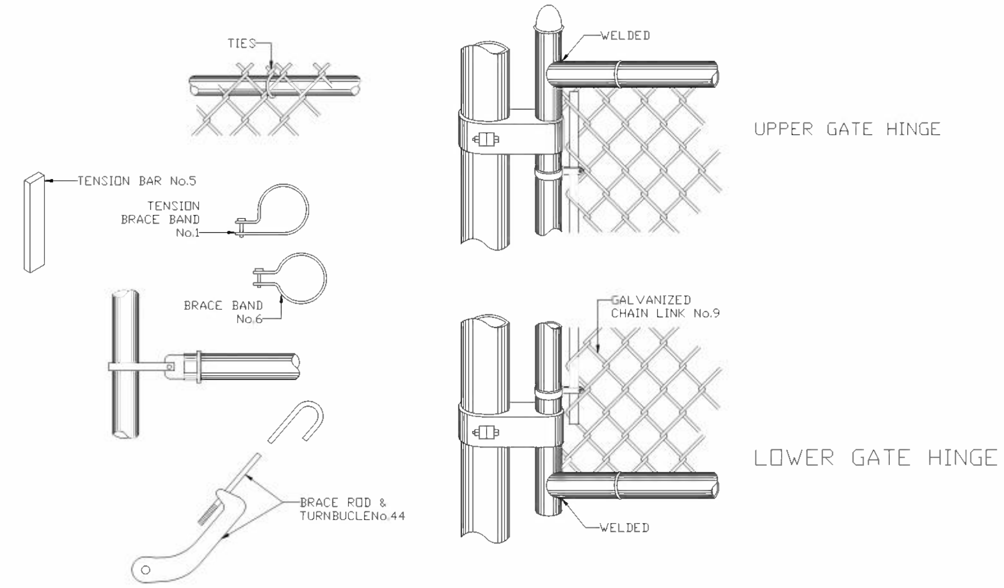
DATE: 10/03/2014
SHEET: 5 OF 7



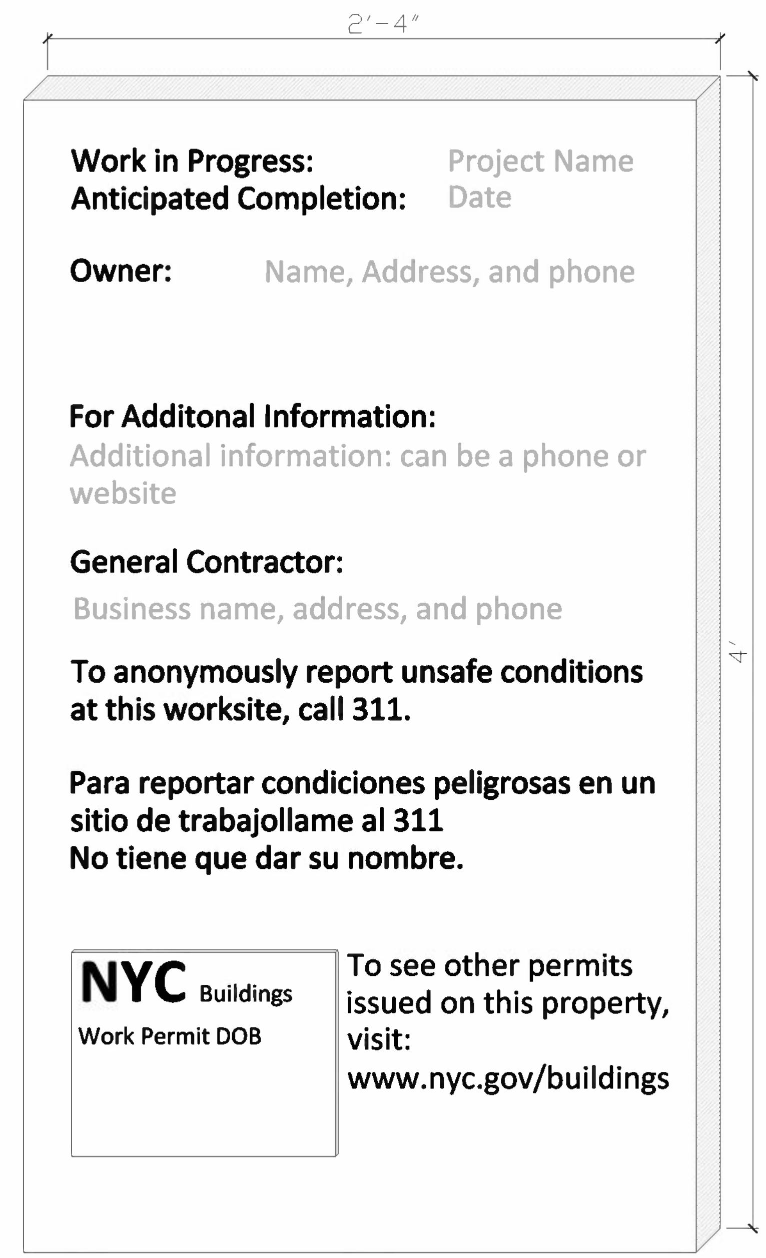
Safety Zone Perimeter Chain Link Fence

Scale 1" = 1' - 0"
0' 0.5' 1' 2'



Chain Link Fence Details

Not to scale



Project Information Panel Sample

Not to scale. See Notes for Details

Notes to Contractor

1) SAFETY ZONE PERIMETER CHAIN LINK FENCE MUST BE COVERED BY THE TARP COVER AND SHALL INCLUDE VIEWING PANELS, AT A RATE OF ONE FOR EVERY 25 LINEAR FEET PER FRONTAGE, WITH A MINIMUM OF ONE PER FRONTAGE. VIEWING PANELS MUST BE 12 X 12 INCHES IN SIZE AND MUST BE BLOCKED WITH PLEXIGLAS.

2)ACTUAL FENCE STRUCTURE CAN BE DEVIATED FROM SHOWN HERE. CONTRACTOR SHALL BE RESPONSIBLE TO COMPLY WITH NYC BUILDING CODE REQUIREMENTS AND TO VERIFY ACTUAL FIELD CONDITIONS VS. APPROVED DESIGN AND NOTIFY ENGINEER OF RECORD ABOUT DISCREPANCIES IF ANY. UPON ENGINEER OF RECORD. DISCRETION, THE STRUCTURAL OBSERVATION SHALL BE CONDUCTED BY THE LICENSED PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF NEW YORK AND APPROPRIATE RECOMMENDATION AND ANY OTHER ADDITIONAL MEASURES SHALL BE PROVIDED.

3)A PROJECT INFORMATION PANEL MUST BE POSTED ON THE FENCE ON EACH PERIMETER FRONTING A PUBLIC THOROUGHFARE. WHERE THE PERIMETER IS MORE THAN 150 FEET IN LA PROJECT INFORMATION PANEL MUST BE POSTED ON THE FENCE ON EACH PERIMETER FRONTING A PUBLIC THOROUGHFARE. WHERE THE PERIMETER IS MORE THAN 150 FEET IN LENGTH, A PROJECT INFORMATION PANEL MUST BE POSTED AT EACH CORNER. THE PANELS MUST BE POSTED ON THE FENCE AT A HEIGHT OF 4 FEET ABOVE THE GROUND, MEASURED FROM THE GROUND TO THE BOTTOM EDGE OF THE PANEL.

4)THE PROJECT INFORMATION PANEL MUST BE 2 FEET 4 INCHES WIDE AND 4 FEET HIGH AND BE CONSTRUCTED OUT OF DURABLE AND WEATHERPROOF MATERIAL SUCH AS VINYL, PLASTIC, OR ALUMINUM; AND FLAME RETARDANT MATERIAL IN ACCORDANCE WITH NFPA 701 OR LISTED UNDER UL 214. THE PROJECT INFORMATION PANEL CONTENT MUST BE WRITTEN IN THE CALIBRI FONT OR SIMILAR SANS SERIF FONT STYLE, WITH LETTERS A MINIMUM OF 1 INCH HIGH, AS MEASURED BY THE UPPER CASE CHARACTER. THE PERMIT MUST BE LAMINATED OR ENCASED IN A PLASTIC COVERING; OR PRINTED DIRECTLY ONTO THE PROJECT INFORMATION PANEL.

5)THE PROJECT INFORMATION PANEL MUST INCLUDE FOLLOWING CONTENT: A) A TITLE LINE STATING "WORK IN PROGRESS: B) ANTICIPATED PROJECT COMPLETION DATE; C) THE CORPORATE NAME, ADDRESS, AND TELEPHONE NUMBER OF THE OWNER OF THE PROPERTY; D) WEBSITE ADDRESS OR PHONE NUMBER TO CONTACT FOR PROJECT INFORMATION; E) THE CORPORATE NAME AND TELEPHONE NUMBER OF THE GENERAL CONTRACTOR, OR FOR A DEMOLITION SITE, THE DEMOLITION CONTRACTOR; F) THE STATEMENT, IN BOTH ENGLISH AND SPANISH, "TO ANONYMOUSLY REPORT UNSAFE CONDITIONS AT THIS WORK SITE, CALL 311." G) A COPY OF THE PRIMARY PROJECT PERMIT, WITH ACCOMPANYING TEXT "TO SEE OTHER PERMITS ISSUED ON THIS PROPERTY, VISIT: WWW.NYC.GOV/BUILDINGS."

6)THE PROJECT INFORMATION PANEL CONTENT MUST BE WRITTEN IN WHITE, ON A BLUE BACKGROUND. COLOR SPECIFICATIONS FOR THE BLUE BACKGROUND TO THE LEFT AND ABOVE OF THE BUILDING IMAGE ARE AS FOLLOWS: PANTONE: 296; RGB: 15, 43, 84 ; CMYK: 100, 88, 38, 35

No.	REVISION	BY

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DRAWING TITLE:
Typical Details

SEAL & SIGNATURE:

DRAWN BY: AL
ENGINEERED BY: AL
VERIFIED BY: SJRJR

DWG #: DM-006.00

DATE: 10/02/2014

SHEET: 6 OF 7

KPR studio
130-28 91st AVE
RICHMOND HILL, NY 11418

LAGUARDIA AIRPORT
Central Terminal Building
Concourse B
New York, NY

Proposed Glass and Metal Facade Fenestration System Mockup Structural Analysis

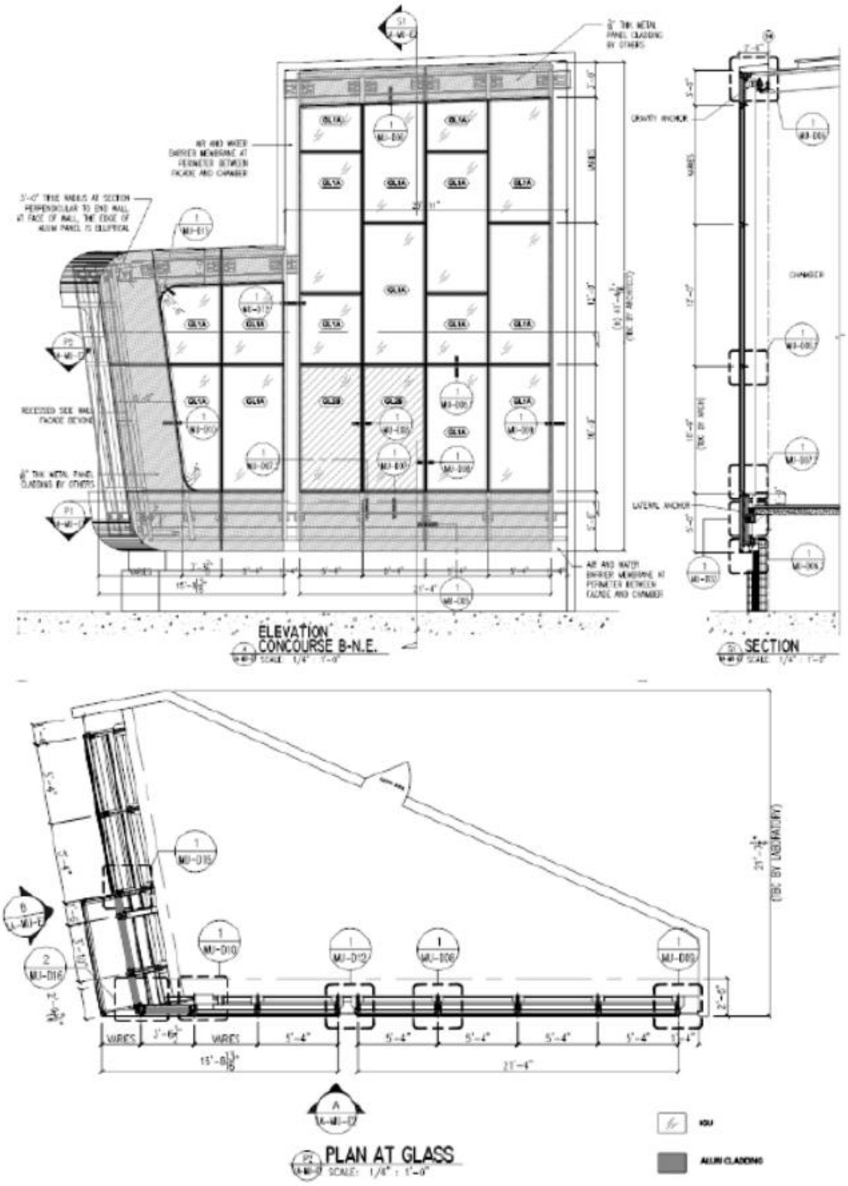
Produced by or under direct supervision of Alexey Leonichev, P.E.
Warning:
It is a violation of 145 NYS Education Law to alter this Document in any way.

STATE OF NEW YORK
ALEXEY LEONICHEV
088085
LICENSED PROFESSIONAL ENGINEER

Tuesday, February 21, 2017

I. Customer-provided Design Task and Data

a) Perform Structural Analysis of Fenestration Mockup as shown on the sketch below:



II. NYC BC 2014 prescribed Design Procedure

a) Design Wind Pressure determination. Wind loads on every building or structure shall be determined in accordance with Chapter 6 of ASCE 7, with the basic wind speed and the exposure category determined in accordance with Sections 1609.3 through 1609.4.
b) Design Seismic Loads Determination. 1613.1 Scope. Every structure, and portion thereof, including nonstructural components that are permanently attached to structures and their supports and attachments, shall be designed and constructed to resist the effects of earthquake motions in accordance with ASCE 7-10, excluding Chapter 14 and Appendix 11A. The seismic design category for a structure shall be determined in accordance with either Section 1613 or ASCE 7-10 (1609.1.1.2.2 NYC BC 2014)

III. NYC BC 2014 and ASCE 7-10 prescribed Design Data

a) Assumed Structural Occupancy Category III (Table 1604.5 NYC BC 2014)
b) Snow Importance Factor I_S=1.10; Wind Importance Factor I_W = 1.15; Seismic Importance Factor I = 1.25 (Table 1604.5.2 NYC BC 2014)
c) Live Load = 75 psf [Table 1607.1 (24-Marquees) NYC BC 2014]
d) Basic Wind Speed V = 98 mph (1609.3 NYC BC 2014)
e) Surface roughness B as for Urban Area (1609.4.2 NYC BC 2014)
f) Wind Exposure Category: Category B (1609.4.3 NYC BC 2014)
g) Assume Site Class D (soils properties not known, 20.1 ASCE 7-10)
h) Mapped Acceleration Parameter S_s =0.25 (Figure 22-1 ASCE 7-10)
i) Mapped Acceleration Parameter S_1 =0.073 (Figure 22-2 ASCE 7-10)
j) Site Coefficient F_a = 1.6 (Table 11.4-1 ASCE 7-10)
k) Site Coefficient F_v = 2.4 (Table 11.4-2 ASCE 7-10)

IV. Design Wind Loads Determination

a) Wind Importance Factor I_W = 1.15 (Table 1604.5 NYC BC 2014)
b) Basic Wind Speed V = 98 mph (1609.3 NYC BC 2014)
c) Surface roughness B as for Urban Area (1609.4.2 NYC BC 2014)
d) Wind Exposure Category: Category B (1609.4.3 NYC BC 2014)
e) Directionality Factor K_d = 0.85 (Table 6-4 ASCE 7-05);
f) Topographic Factor $K_{ZT} = (l+K_1K_2K_3)^2 = 1$ (Sec.6.5.7.2 ASCE 7-05);
g) Velocity Pressure $q_z = 0.00256K_zK_{zt}K_dV^2I = 0.00256*K_z*1*0.85*98^2*1.15 \approx 24K_z$ lb/ft^2
h) Internal Pressure Coefficient $GC_{pi} = \pm 0.18$ (Table 6-5 ASCE 7-05);
i) Effective Wind Area 12.5'x (12.5'/3) ≈ 52 sq.ft (Sec.6.2 ASCE 7-05);
j) External Pressure Coefficient GC_p (Table 6-5 ASCE 7-05);

	Wall		Roof		
Zone #	Zone 4	Zone 5	Zone 1	Zone 2	Zone 3
GC_p	+0.8; -0.85	+0.8; -1.53	-1.18	-1.98	-2.8

k) K_h @ mean roof height h=660', $K_h = 2.01(Z/Z_g)^{2/\alpha}$ = 2.01x(42/1200)2/7 = 0.99239

z	Zg	α	2/α	Kh
42	1200	9.5	0.210526	0.99239

l) Velocity pressure @ mean roof height h=42', $q_h = 24K_h$ lb/ft^2 = 23.8 lb/ft^2 = q_i
m) Velocity Pressure Coefficient K_z, case 2 (h≥60ft) from Table 6-3 ASCE 7-05
n) Design wind pressure $p = q_z (GC_p) - q_i(GC_{pi})$ lb/ft^2:

Zone 4 (Wall) Wind Positive Pressure

Elevation Z, ft	20.00	30.00	42.00
K_z	0.62	0.70	0.81
qz lb/ft2	14.88	16.80	19.44
GCp	**0.80**	**0.80**	**0.80**
qi, lb/ft2	42.53	42.53	42.53
+GCpi	0.18	0.18	0.18
-GCpi	-0.18	-0.18	-0.18
(+Gcpi) P, lb/ft2	4.2486	5.7846	7.8966
(-Gcpi) P, lb/ft2	19.559	21.095	23.207

Zone 4 (Wall) Wind Negative Pressure

Elevation Z, ft	20.00	30.00	42.00
K_z	0.62	0.70	0.81
qz lb/ft2	14.88	16.80	19.44
GCp	**-0.85**	**-0.85**	**-0.85**
qi, lb/ft2	23.8	23.8	23.8
+GCpi	0.18	0.18	0.18
-GCpi	-0.18	-0.18	-0.18
(+Gcpi) P, lb/ft2	-16.93	-18.56	-20.81
(-Gcpi) P, lb/ft2	-8.364	-9.996	-12.24

Zone 5 (Wall) Wind Positive Pressure

Elevation Z, ft	20.00	30.00	42.00
K_z	0.62	0.70	0.81
qz lb/ft2	14.88	16.80	19.44
GCp	**0.80**	**0.80**	**0.80**
qi, lb/ft2	23.8	23.8	23.8
+GCpi	0.18	0.18	0.18
-GCpi	-0.18	-0.18	-0.18
(+Gcpi) P, lb/ft2	7.62	9.156	11.268
(-Gcpi) P, lb/ft2	16.188	17.724	19.836

Zone 5 (Wall) Wind Negative Pressure

Elevation Z, ft	20.00	30.00	42.00
K_z	0.62	0.70	0.81
qz lb/ft2	14.88	16.80	19.44
GCp	**-1.53**	**-1.53**	**-1.53**
qi, lb/ft2	23.8	23.8	23.8
+GCpi	0.18	0.18	0.18
-GCpi	-0.18	-0.18	-0.18
(+Gcpi) P, lb/ft2	-27.05	-29.99	-34.03
(-Gcpi) P, lb/ft2	-18.48	-21.42	-25.46

V. Design Seismic Loads Determination

a) Assume Site Class D (soils properties not known, 20.1 ASCE 7-10)
b) Mapped Acceleration Parameter S_s =0.25 (Figure 22-1 ASCE 7-10)
c) Mapped Acceleration Parameter S_1 =0.073 (Figure 22-2 ASCE 7-10)
d) Site Coefficient F_a = 1.6 (Table 11.4-1 ASCE 7-10)
e) Site Coefficient F_v = 2.4 (Table 11.4-2 ASCE 7-10)
f) $S_{MS} = F_a * S_s =$ 1.600 * 0.250 = 0.400 (11.4.1 ASCE 7-10)
g) $S_{M1} = Fv * S_1 =$ 2.400 * 0.073 = 0.175 (11.4.2 ASCE 7-10)
h) $S_{DS} = \frac{2}{3} S_{MS} =$ 0.667 * 0.400 = 0.267 (11.4.3 ASCE 7-10)
i) $S_{D1} = \frac{2}{3} S_{M1} =$ 0.667 * 0.175 = 0.117 (11.4.4 ASCE 7-10)
j) Seismic Design Category B. Per Table 11.6-1 ASCE 7-10, for S_{DS} = 0.267 and Occupancy Category III, determined Seismic Design Category B; Per Table 11.6-2 ASCE 7-10, for S_{D1} = 0.117 and Occupancy Category III, determined Seismic Design Category B.
k) Component amplification factor a_p = 1.0 (Table 13.5-1 ASCE 7-10)
l) Component amplification factor R_p = 2.5 (Table 13.5-1 ASCE 7-10)
m) Component importance factor R_p = 1.0 (13.1.3 ASCE 7-10)
n) h = 660' and z = 90', and [1+2(z/h)] = [1+2(90/660)] = 1.27 (13.3-1 ASCE 7-10)
o) Seismic Design Coefficient $C_S = [(0.4a_pS_{DS}I_p)/R_p] \times [1+2(z/h)]$ = (13.3-1 ASCE 7-10)
p) C_S = [(0.4 x 1 x 0.267 x 1.0)/2.5]x1.27 = 0.0542544
q) $C_{S\ max} \leq 1.6S_{DS}I_p$ = 1.6 x 0.267 x 1.0 = 0.4272 (13.3-2 ASCE 7-10)
r) $C_{S\ min} \geq 1.6S_{DS}I_p$ = 0.3 x 0.267 x 1.0 = 0.08 (13.3-3 ASCE 7-10)
s) Assume $C_S = C_{S\ min}$ = 0.120; F_p = 0.08 W_p = 0.08D Assume **E = 0.08D**

VI. ASD Critical Load Combination (1605.3.1 NYC BC 2014):

Prescribed	Applicable	Equation
D + F	D	[Eq. 16-12]
D + H + F + L + T	D + L	[Eq. 16-13]
D + H + F + (L_R or S or R)	D + (L_R or S)	[Eq. 16-14]
D + H + F + 0.75(L + T) + 0.75(L_R or S or R)	D + 0.75L + 0.75(L_R or S)	[Eq. 16-15]
D + F + H + (W or 0.7E)	D + (W or 0.7E)	[Eq. 16-16]
D + H + F + 0.75(W or 0.7E) + 0.75(L_R or S or R)	D + 0.75(0.7E)	[Eq. 16-17]
0.6D + W + H	0.6D + W	[Eq. 16-18]
0.6D + 0.7E + H	0.6D + 0.7E	[Eq. 16-19]

By applicability inspection, FINALLY assumed critical Load Combinations:

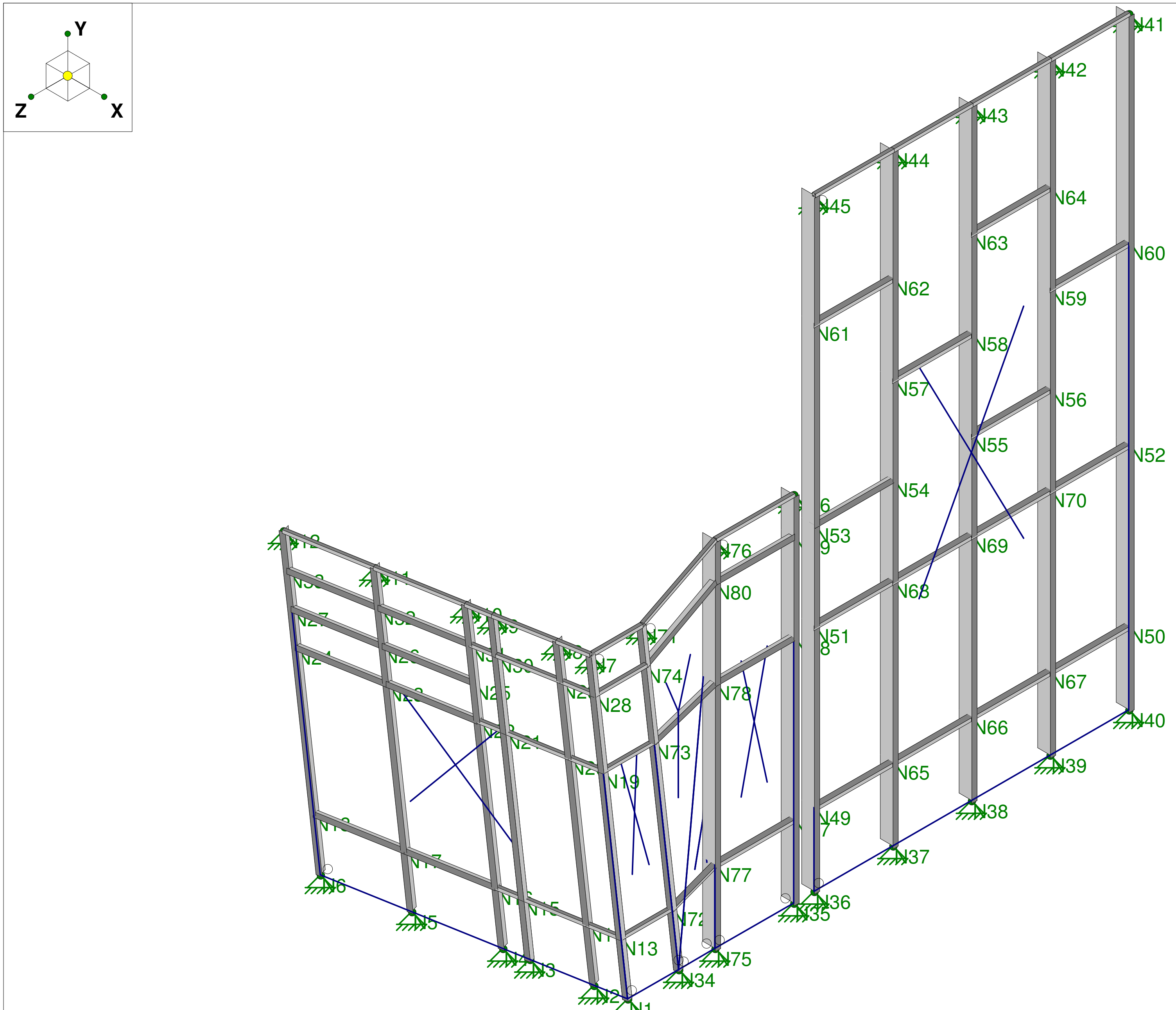
for Curtain Wall	Equation
D + W or D + 0.7E	[Eq. 16-16]

Abbreviations and Notations used

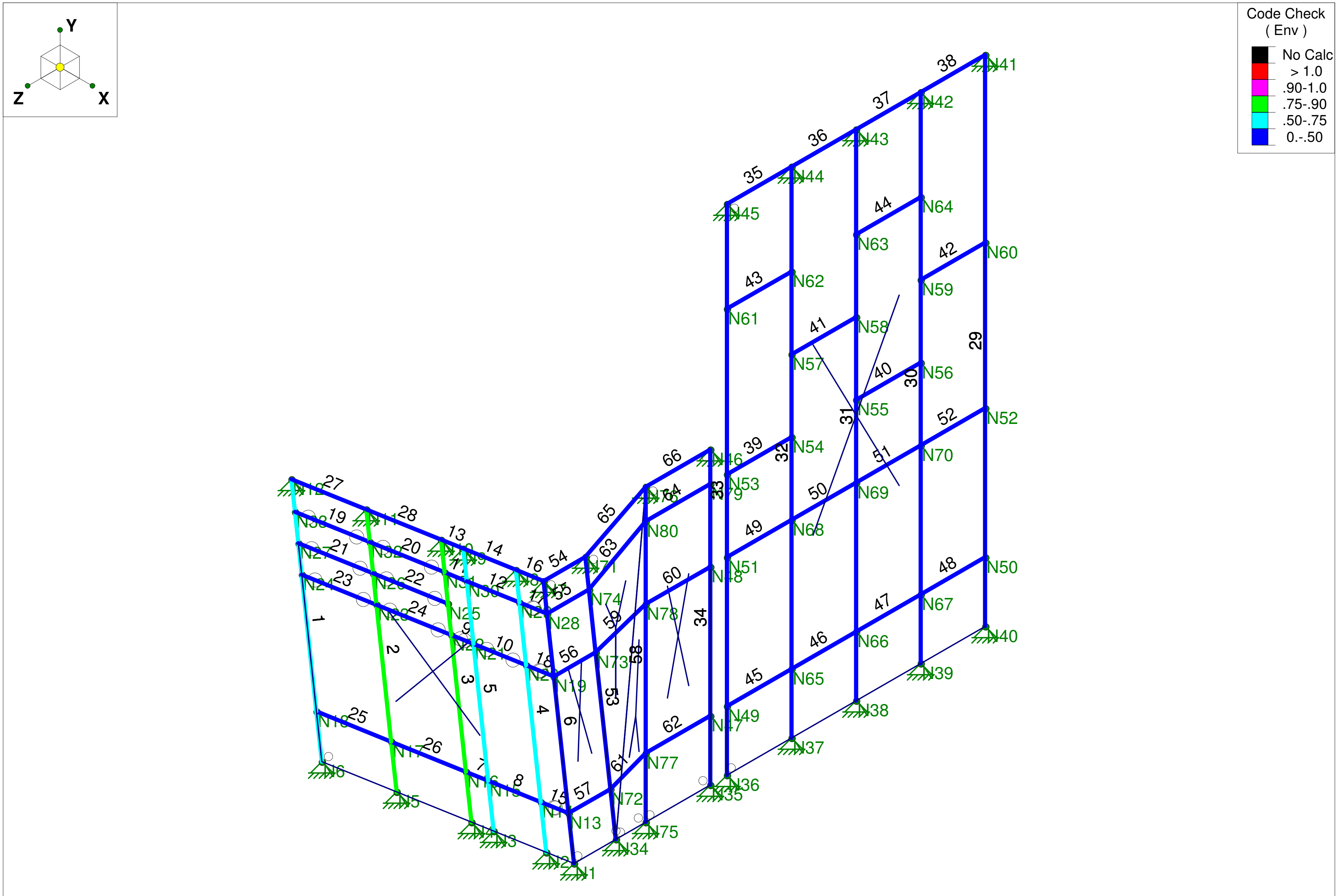
D = Dead load.
E = Combined effect of horizontal and vertical earthquake induced forces
E_m = Maximum seismic load effect of horizontal and vertical seismic forces
F = Load due to fluids with well-defined pressures and maximum heights
F_a = Flood load.
H = Load due to lateral earth pressures, ground water pressure or pressure of bulk
L = Live load, except roof live load, including any permitted live load reduction.
L_r = Roof live load including any permitted live load reduction.
R = Rain load.
S = Snow load.
T = Self-straining force arising from contraction or expansion
W = Load due to wind pressure.

VII. RISA 3D Structural Analysis

(See next pages)



KPA Studio	LAGUARDIA AIRPORT Bldg. B Fenestration	Fig. 1
Alexey Leonichev, P.E.	Isometric View	Feb 21, 2017 at 4:59 PM
		MockUpCalcs 022117.r3d



KPA Studio	LAGUARDIA AIRPORT Bldg. B Fenestration	Fig. 2
Alexey Leonichev, P.E.	Member Numbering	Feb 21, 2017 at 5:09 PM
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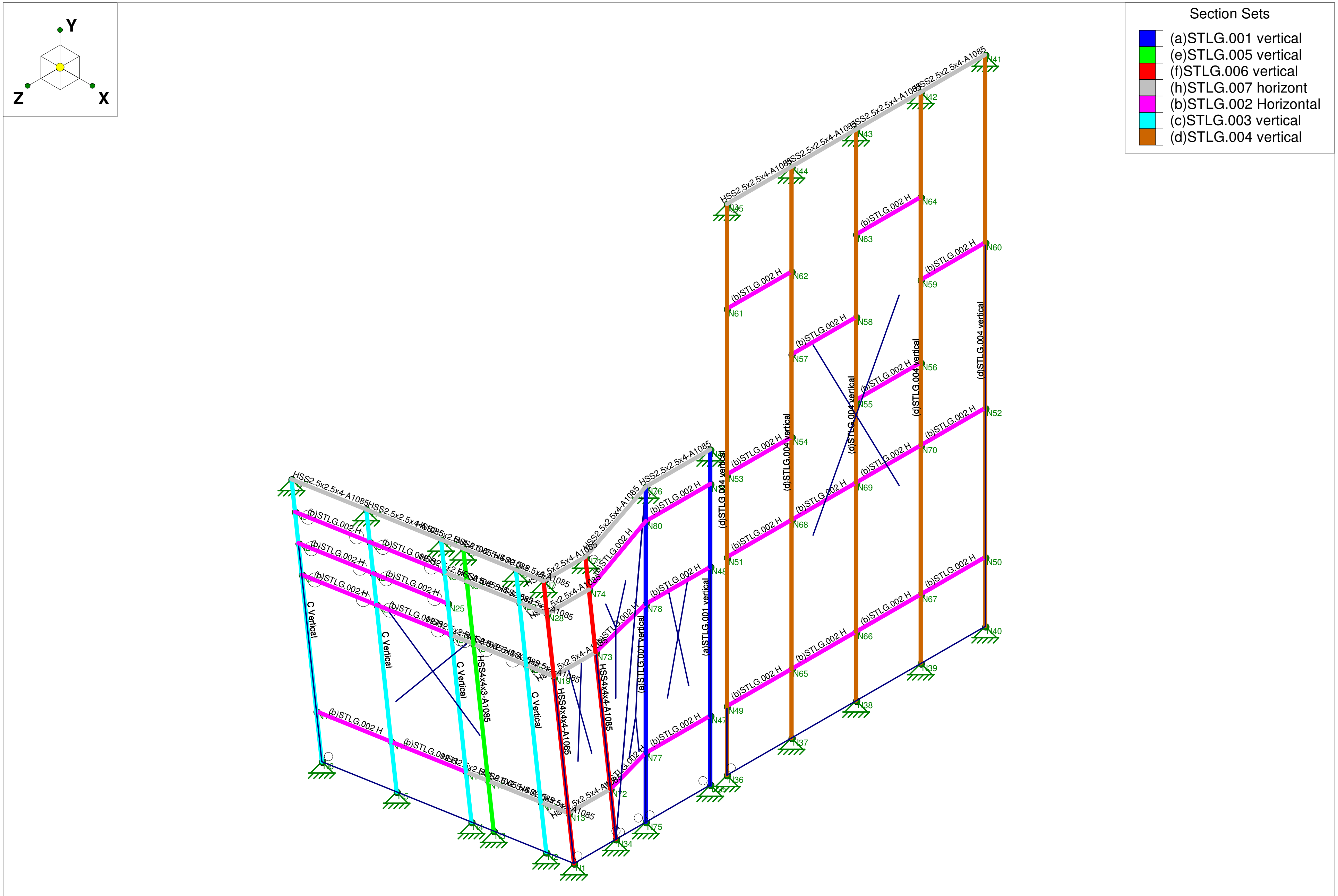

KPA Studio	LAGUARDIA AIRPORT Bldg. B Fenestration	Fig. 3
Alexey Leonichev, P.E.	Section Sets & Shapes	Feb 21, 2017 at 5:11 PM
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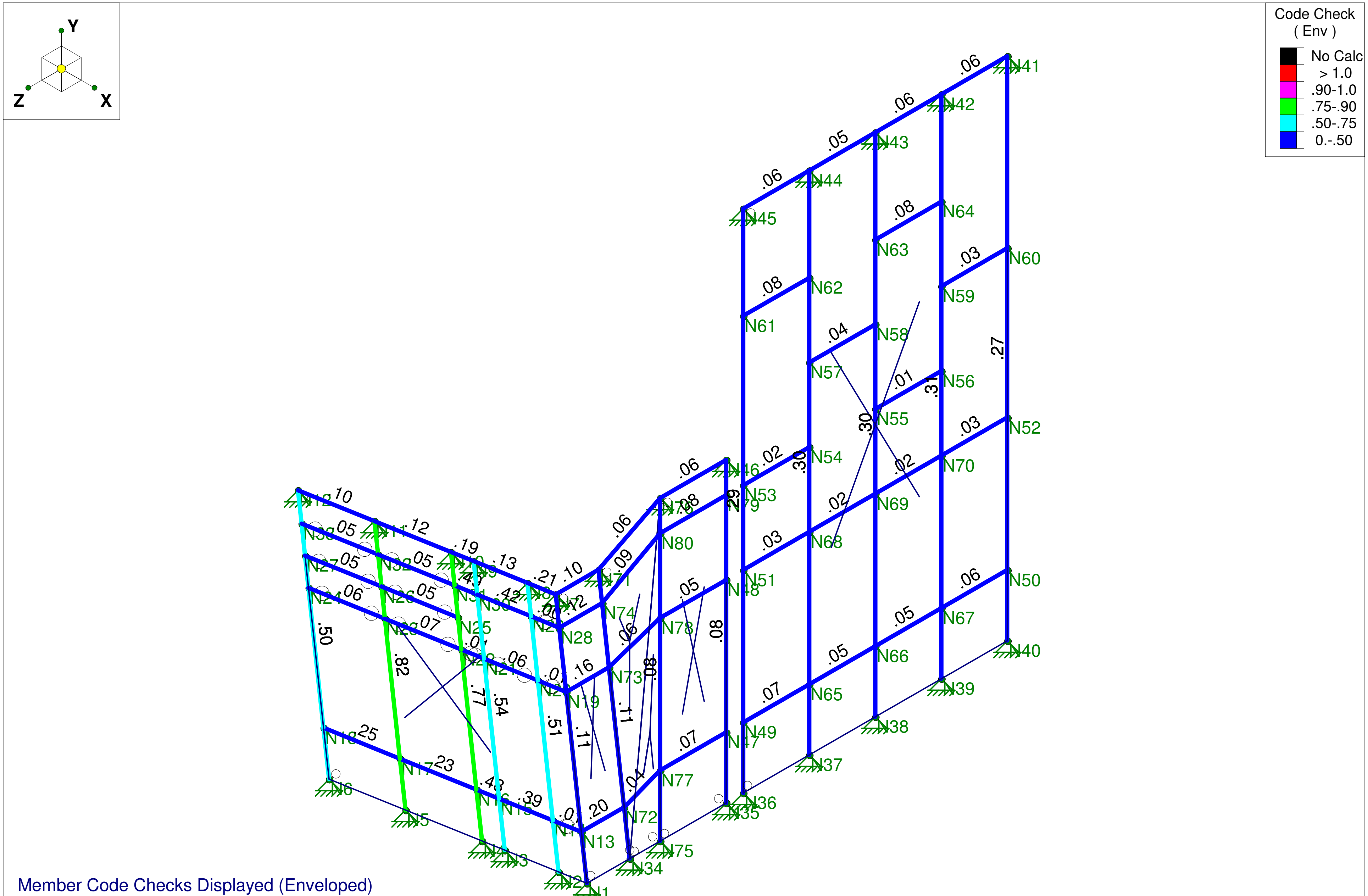
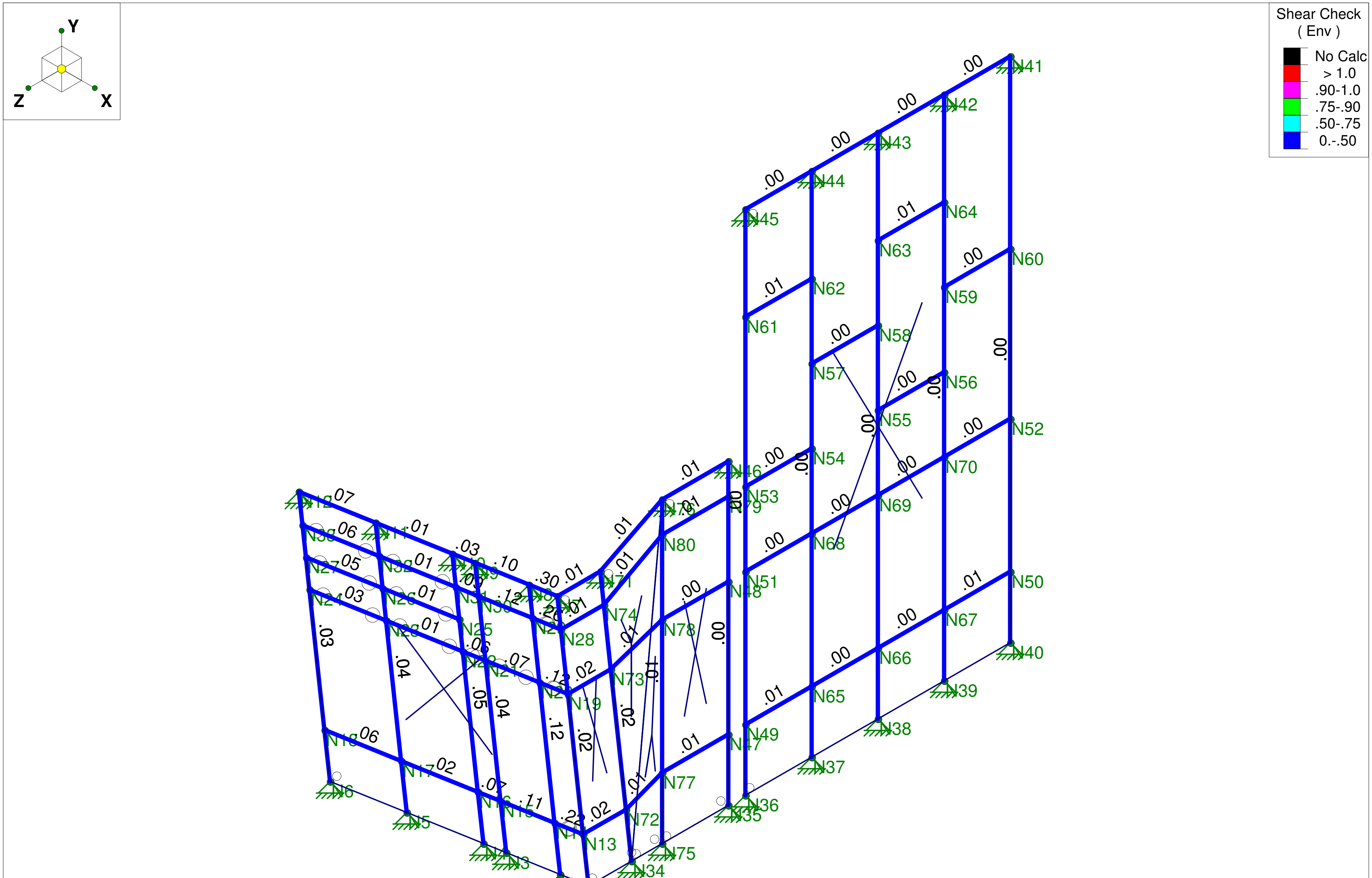


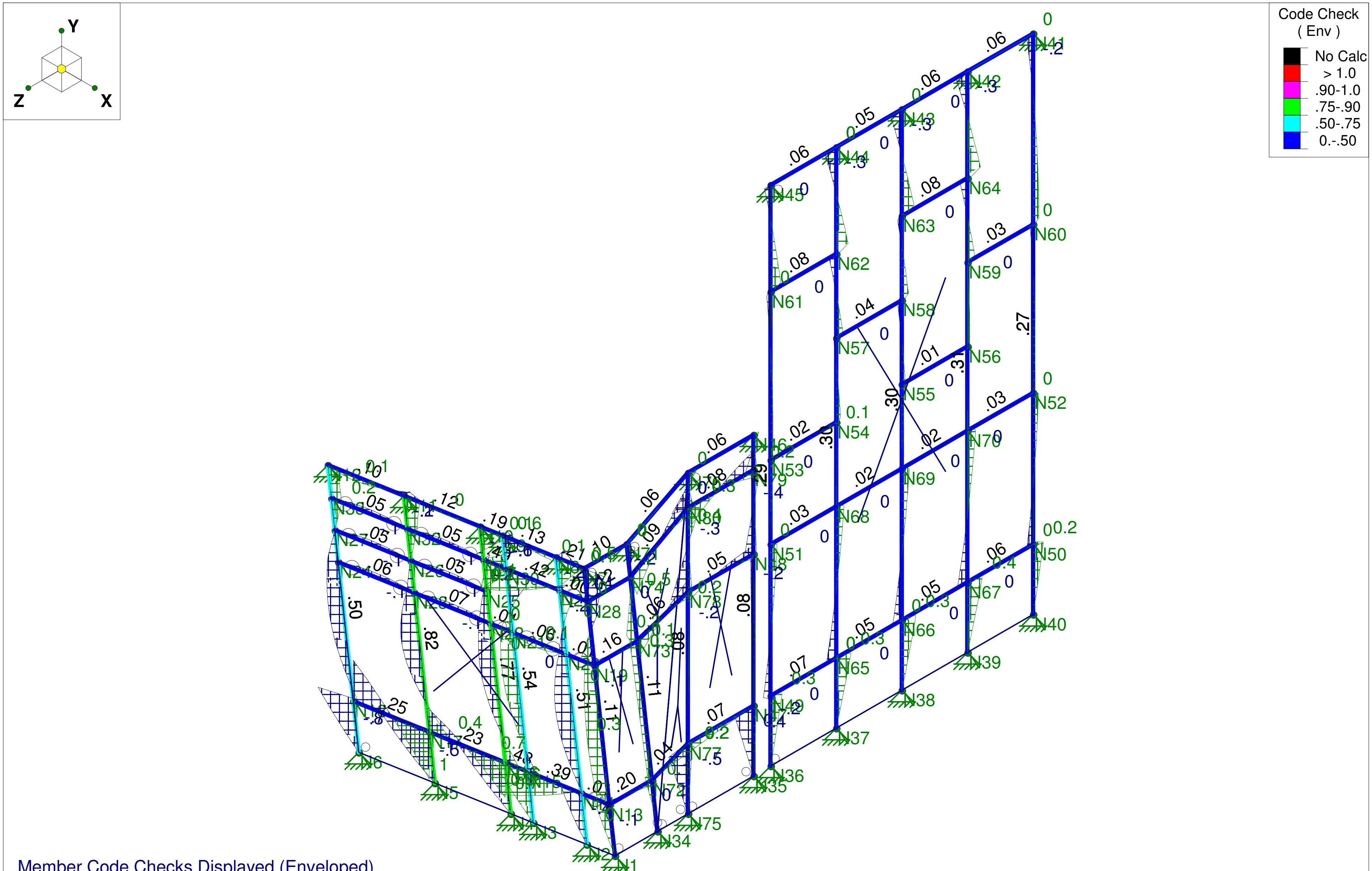
Member Code Checks Displayed (Enveloped)
Results for LC 1, NYC BC eq. 16-16

KPA Studio	LAGUARDIA AIRPORT Bldg. B Fenestration	Fig. 4
Alexey Leonichev, P.E.		Feb 21, 2017 at 5:13 PM
	ASD Code Check	MockUpCalcs 022117.r3d



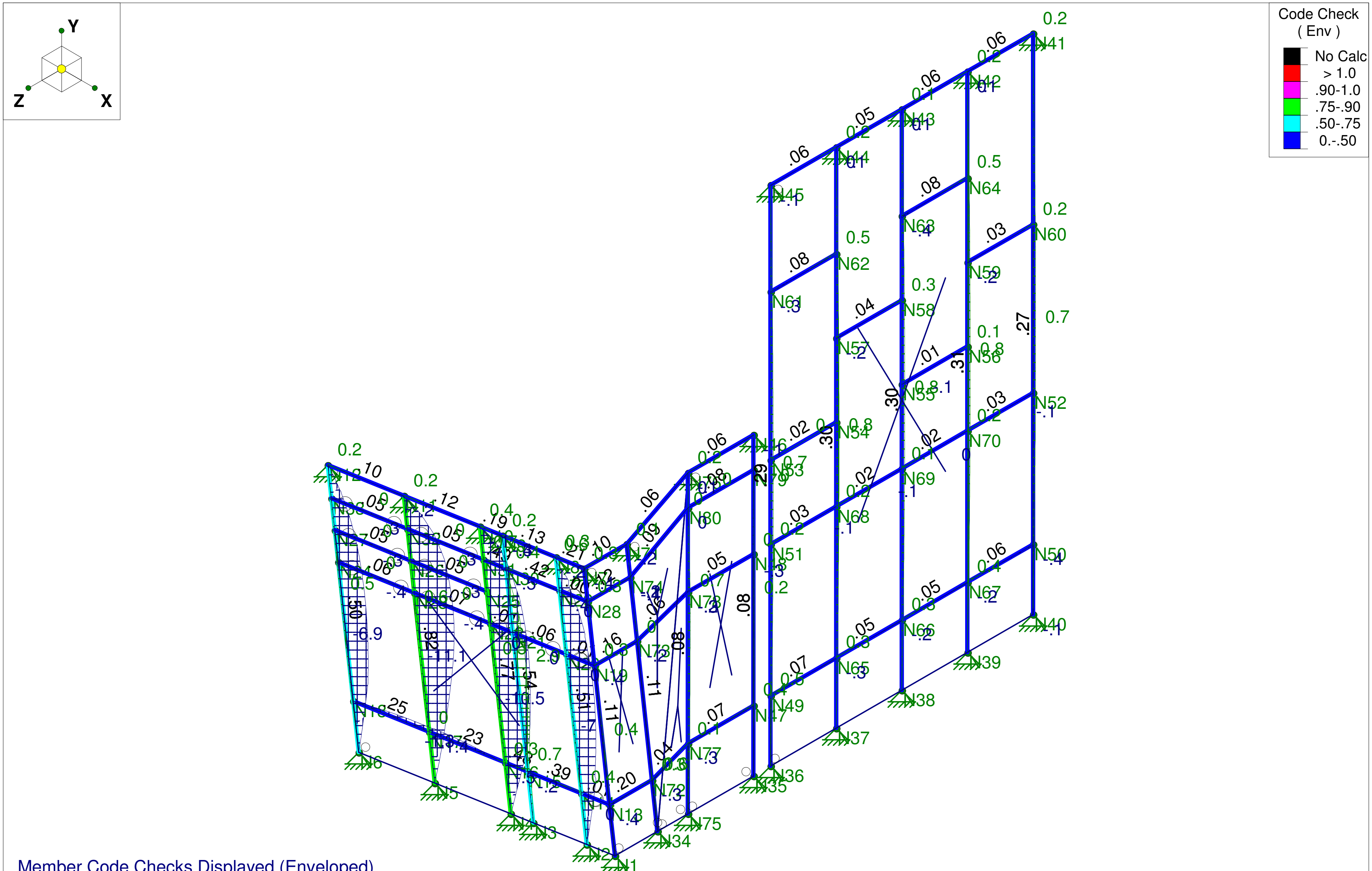
Member Shear Checks Displayed (Enveloped)
Results for LC 1, NYC BC eq. 16-16

KPA Studio		Fig. 5
Alexey Leonichev, P.E.	LAGUARDIA AIRPORT Bldg. B Fenestration	Feb 21, 2017 at 5:16 PM
	ASD Shear Check	MockUpCalcs 022117.r3d



Member Code Checks Displayed (Enveloped)
Results for LC 1, NYC BC eq. 16-16
Member y Bending Moments (k-ft) (Enveloped)

KPA Studio	LAGUARDIA AIRPORT Bldg. B Fenestration	Fig. 6
Alexey Leonichev, P.E.		Feb 21, 2017 at 5:29 PM
	Y-Y Bending Moment Diagram	MockUpCalcs 022117.r3d



Member Code Checks Displayed (Enveloped)
Results for LC 1, NYC BC eq. 16-16
Member z Bending Moments (k-ft) (Enveloped)

KPA Studio		Fig. 7
Alexey Leonichev, P.E.	LAGUARDIA AIRPORT Bldg. B Fenestration	Feb 21, 2017 at 5:30 PM
	Z-Z Bending Moment Diagram	MockUpCalcs 022117.r3d

Envelope AISC ASD Steel Code Checks

	Member	Shape	Code C...	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	Fa [ksi]	Ft [ksi]	Fb y-y [...	Fb z-z [...	Cb	Cmy	Cmz	ASD Eqn
1	M1	C Vertical	.505	10.547	1	.028	22.5	y	1	1.696	21.6	21.6	21.6	1	.85	.85	H2-1
2	M2	C Vertical	.817	11.25	1	.038	22.5	y	1	1.696	21.6	21.6	21.6	1	.85	.85	H2-1
3	M3	C Vertical	.771	10.313	1	.054	22.5	y	1	1.696	21.6	21.6	21.6	1	.85	.85	H2-1
4	M4	C Vertical	.513	10.547	1	.120	22.5	y	1	1.696	21.6	21.6	21.6	1	.85	.85	H2-1
5	M5	HSS4x4x...	.542	11.25	1	.041	22.5	z	1	4.871	21.6	21.6	21.6	1	.85	.85	H2-1
6	M6	HSS4x4x...	.109	22.5	1	.020	19.922	y	1	4.69	21.6	21.6	21.6	1	.85	.85	H2-1
7	M7	HSS2.5x2...	.482	1.6	1	.073	1.6	y	1	20.516	21.6	23.76	23.76	2.3	.85	.85	H1-2
8	M8	HSS2.5x2...	.387	0	1	.105	3.048	z	1	18.288	21.6	23.76	23.76	2.3	.85	.85	H1-2
9	M9	HSS2.5x2...	.012	.817	1	.058	1.6	z	1	20.516	21.6	23.76	23.76	1	1	1	H1-3
10	M10	HSS2.5x2...	.056	1.979	1	.070	0	z	1	18.288	21.6	23.76	23.76	1	1	1	H1-3
11	M11	HSS2.5x2...	.487	1.6	1	.085	0	y	1	20.516	21.6	23.76	23.76	2.3	.85	.85	H1-2
12	M12	HSS2.5x2...	.425	0	1	.117	3.048	z	1	18.288	21.6	23.76	23.76	2.3	.85	.85	H1-2
13	M13	HSS2.5x2...	.191	0	1	.030	0	y	1	20.516	21.6	23.76	23.76	2.3	.85	.85	H2-1
14	M14	HSS2.5x2...	.126	0	1	.098	0	z	1	18.288	21.6	23.76	23.76	2.3	.85	.85	H2-1
15	M15	HSS2.5x2...	.005	1	1	.224	2	y	1	20.17	21.6	23.76	23.76	1	.6	1	H1-3
16	M16	HSS2.5x2...	.209	0	1	.301	0	y	1	20.17	21.6	23.76	23.76	2.3	.44	.85	H1-2
17	M17	HSS2.5x2...	.002	1	1	.264	0	y	1	20.17	21.6	23.76	23.76	1	.6	1	H2-1
18	M18	HSS2.5x2...	.006	1	1	.125	2	y	1	20.17	21.6	23.76	23.76	1	.6	1	H1-3
19	M19	(b)STLG....	.053	2.7	1	.059	0	y	1	17.056	21.6	21.6	21.6	1	1	1	H2-1
20	M20	(b)STLG....	.046	2.756	1	.010	5.4	y	1	17.056	21.6	21.6	21.6	1	1	1	H2-1
21	M21	(b)STLG....	.052	2.7	1	.047	0	y	1	17.056	21.6	21.6	21.6	1	1	1	H2-1
22	M22	(b)STLG....	.047	2.813	1	.010	5.4	y	1	17.056	21.6	21.6	21.6	1	1	1	H2-1
23	M23	(b)STLG....	.063	2.7	1	.031	0	y	1	17.056	21.6	21.6	21.6	1	1	1	H2-1
24	M24	(b)STLG....	.066	2.812	1	.007	5.4	y	1	17.056	21.6	21.6	21.6	1	1	1	H2-1
25	M25	(b)STLG....	.246	5.4	1	.057	0	y	1	17.056	21.6	21.6	21.6	1	.85	.85	H1-2
26	M26	(b)STLG....	.233	0	1	.017	4.894	y	1	17.056	21.6	21.6	21.6	2....	.85	.85	H2-1
27	M27	HSS2.5x2...	.105	5.4	1	.073	4.556	z	1	16.215	21.6	23.76	23.76	2.3	.85	.85	H1-2
28	M28	HSS2.5x2...	.120	0	1	.010	0	z	1	16.215	21.6	23.76	23.76	2.3	.85	.85	H2-1
29	M29	(d)STLG....	.271	0	5	.001	0	z	4	.3	21.6	21.6	8.37	1	.6	.6	H1-1
30	M30	(d)STLG....	.308	3.881	4	.002	41.4	z	4	.3	21.6	21.6	8.37	1	.85	.6	H1-1
31	M31	(d)STLG....	.302	0	5	.002	41.4	z	4	.3	21.6	21.6	8.37	1	.6	.6	H1-1
32	M32	(d)STLG....	.304	0	5	.002	41.4	z	4	.3	21.6	21.6	8.37	1	.6	.6	H1-1
33	M33	(d)STLG....	.285	0	4	.001	0	z	4	.3	21.6	21.6	8.37	1	.85	.6	H1-1
34	M34	(a)STLG....	.083	4.809	1	.003	22.022	z	1	.939	21.6	21.6	14.204	1	.602	.6	H1-1
35	M35	HSS2.5x2...	.058	5.4	4	.004	5.4	y	4	16.215	21.6	23.76	23.76	2.3	.6	.85	H2-1
36	M36	HSS2.5x2...	.055	5.4	4	.004	5.4	y	4	16.215	21.6	23.76	23.76	2.3	.6	.85	H2-1
37	M37	HSS2.5x2...	.057	5.4	4	.004	5.4	y	4	16.215	21.6	23.76	23.76	2.3	.6	.85	H2-1
38	M38	HSS2.5x2...	.057	5.4	4	.004	5.4	y	4	16.215	21.6	23.76	23.76	2.3	.6	.85	H2-1
39	M39	(b)STLG....	.016	5.4	4	.002	5.4	z	4	17.056	21.6	21.6	21.6	1....	.85	.6	H2-1
40	M40	(b)STLG....	.013	5.4	4	.002	5.4	y	4	17.056	21.6	21.6	21.6	2....	.6	.85	H1-2
41	M41	(b)STLG....	.044	5.4	4	.004	5.4	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
42	M42	(b)STLG....	.034	5.4	4	.004	5.4	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
43	M43	(b)STLG....	.076	5.4	4	.006	5.4	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
44	M44	(b)STLG....	.081	5.4	4	.006	5.4	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
45	M45	(b)STLG....	.074	0	4	.006	0	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
46	M46	(b)STLG....	.053	0	4	.005	0	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
47	M47	(b)STLG....	.055	0	4	.005	0	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
48	M48	(b)STLG....	.065	0	4	.006	0	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
49	M49	(b)STLG....	.027	0	4	.003	0	y	4	17.056	21.6	21.6	21.6	2....	.6	.85	H1-3
50	M50	(b)STLG....	.024	0	4	.003	0	y	4	17.056	21.6	21.6	21.6	2....	.6	.85	H1-3
51	M51	(b)STLG....	.024	0	4	.003	0	y	4	17.056	21.6	21.6	21.6	1....	.6	.85	H1-3
52	M52	(b)STLG....	.027	0	4	.003	0	y	4	17.056	21.6	21.6	21.6	2.3	.6	.85	H1-2
53	M53	HSS4x4x...	.110	3.984	1	.024	3.984	y	1	4.69	21.6	21.6	21.6	1	.735	.85	H1-2
54	M54	HSS2.5x2...	.097	0	1	.010	0	y	1	18.636	21.6	23.76	23.76	2.3	.716	.85	H1-2
55	M55	HSS2.5x2...	.115	0	1	.015	0	y	1	18.636	21.6	23.76	23.76	2.3	.689	.85	H1-2
56	M56	HSS2.5x2...	.157	0	1	.017	0	y	1	18.636	21.6	23.76	23.76	2.3	.208	.85	H1-2
57	M57	HSS2.5x2...	.203	0	1	.022	3.5	y	1	18.636	21.6	23.76	23.76	2.3	.269	.85	H1-2
58	M58	(a)STLG....	.079	4.809	1	.009	22.022	z	1	.939	21.6	21.6	21.6	1	.601	.6	H2-1
59	M59	(b)STLG....	.061	0	1	.007	0	z	1	17.859	21.6	21.6	21.6	1....	.85	.588	H1-2
60	M60	(b)STLG....	.051	0	1	.003	0	z	1	17.056	21.6	21.6	21.6	1....	.85	.607	H1-2
61	M61	(b)STLG....	.042	0	1	.012	3.222	y	1	19.28	21.6	21.6	21.6	2.3	.542	.85	H2-1

Envelope AISC ASD Steel Code Checks (Continued)

	Member	Shape	Code C...	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	Fa [ksi]	Ft [ksi]	Fb y-y [...	Fb z-z [...	Cb	Cmy	Cmz	ASD Eqn
62	M62	(b)STLG....	.068	5.4	1	.007	5.4	y	1	17.056	21.6	21.6	21.6	2.3	.596	.85	H1-2
63	M63	(b)STLG....	.088	0	1	.009	0	z	1	16.763	21.6	21.6	21.6	1....	.85	.809	H1-2
64	M64	(b)STLG....	.079	0	1	.006	0	z	1	17.056	21.6	21.6	21.6	1....	.85	.615	H1-2
65	M65	HSS2.5x2...	.055	0	1	.007	0	y	1	15.403	21.6	23.76	23.76	2.3	.366	.85	H1-2
66	M66	HSS2.5x2...	.061	0	1	.006	0	y	1	16.215	21.6	23.76	23.76	2.3	.85	.85	H1-2

Envelope Member Section Deflections

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
1	M1	1	max	0	1	0	1	0	1	3.703e-03	1	NC	1	NC	1
2			min	0	1	0	1	0	1	-6.975e-05	4	NC	1	NC	1
3		2	max	0	1	.035	4	.08	1	3.43e-03	1	NC	2	NC	2
4			min	0	5	-.501	1	0	4	-6.514e-05	4	538.665	1	3387.965	1
5		3	max	0	6	.05	4	.104	1	2.486e-03	1	7552.262	2	NC	2
6			min	0	1	-.688	1	-.001	4	-4.919e-05	4	392.283	1	2597.37	1
7		4	max	0	6	.036	4	.057	1	1.542e-03	1	NC	2	NC	2
8			min	0	1	-.486	1	0	4	-3.324e-05	4	555.548	1	4697.107	1
9		5	max	0	1	0	1	0	1	5.975e-04	1	NC	1	NC	1
10			min	0	1	0	1	0	1	-1.729e-05	4	NC	1	NC	1
11	M2	1	max	0	1	0	1	0	1	1.573e-03	1	NC	1	NC	1
12			min	0	1	0	1	0	1	-6.807e-06	6	NC	1	NC	1
13		2	max	0	4	.039	4	.077	1	1.424e-03	1	9562.938	2	NC	2
14			min	0	1	-.762	1	-.001	4	-5.963e-06	6	354.504	1	3489.665	1
15		3	max	0	4	.057	4	.106	1	9.068e-04	1	6648.241	2	NC	2
16			min	0	1	-1.083	1	-.001	4	-3.042e-06	6	249.392	1	2538.394	1
17		4	max	0	4	.042	4	.057	1	3.894e-04	1	8984.682	2	NC	2
18			min	0	1	-.778	1	0	4	-1.213e-07	6	347.261	1	4704.873	1
19		5	max	0	1	0	1	0	1	3.621e-06	4	NC	1	NC	1
20			min	0	1	0	1	0	1	-1.279e-04	1	NC	1	NC	1
21	M3	1	max	0	1	0	1	0	1	5.927e-05	4	NC	1	NC	1
22			min	0	1	0	1	0	1	-2.663e-04	1	NC	1	NC	1
23		2	max	0	6	.036	4	.076	1	5.71e-05	4	NC	2	NC	2
24			min	0	5	-.782	1	-.001	4	-1.424e-04	1	345.392	1	3534.459	1
25		3	max	0	4	.051	4	.102	1	2.868e-04	1	7376.468	2	NC	2
26			min	0	1	-1.067	1	-.002	4	3.691e-05	2	253.155	1	2644.881	1
27		4	max	0	4	.037	4	.058	1	7.16e-04	1	NC	2	NC	2
28			min	0	1	-.755	1	0	4	3.178e-05	2	357.57	1	4684.734	1
29		5	max	0	1	0	1	0	1	5.916e-06	1	NC	1	NC	1
30			min	0	1	0	1	0	1	1.292e-06	2	NC	1	NC	1
31	M4	1	max	0	1	0	1	0	1	1.7e-04	4	NC	1	NC	1
32			min	0	1	0	1	0	1	-6.184e-03	1	NC	1	NC	1
33		2	max	0	4	.026	4	.084	1	1.649e-04	4	NC	2	NC	2
34			min	0	1	-.501	1	-.001	4	-5.974e-03	1	539.388	1	3221.752	1
35		3	max	0	4	.036	4	.109	1	1.472e-04	4	NC	2	NC	2
36			min	0	1	-.691	1	-.002	4	-5.247e-03	1	390.719	1	2484.605	1
37		4	max	0	6	.026	4	.056	1	1.295e-04	4	NC	2	NC	2
38			min	0	1	-.488	1	0	4	-4.521e-03	1	553.303	1	4781.233	1
39		5	max	0	1	0	1	0	1	8.527e-06	4	NC	1	NC	1
40			min	0	1	0	1	0	1	-3.25e-04	1	NC	1	NC	1
41	M5	1	max	0	1	0	1	0	1	8.916e-05	4	NC	1	NC	1
42			min	0	1	0	1	0	1	-1.416e-03	1	NC	1	NC	1
43		2	max	0	4	.799	1	.001	4	8.552e-05	4	NC	2	NC	2
44			min	0	1	-.035	4	-.079	1	-1.319e-03	1	337.935	1	3435.087	1
45		3	max	0	4	1.194	1	.001	4	7.293e-05	4	7570.968	2	NC	2
46			min	0	1	-.05	4	-.105	1	-9.805e-04	1	226.066	1	2568.196	1
47		4	max	0	1	.827	1	0	4	6.033e-05	4	NC	2	NC	2
48			min	0	5	-.036	4	-.055	1	-6.424e-04	1	326.598	1	4925.381	1
49		5	max	0	1	0	1	0	1	9.405e-06	4	NC	1	NC	1
50			min	0	1	0	1	0	1	-3.682e-05	1	NC	1	NC	1
51	M6	1	max	0	1	0	1	0	1	1.241e-04	1	NC	1	NC	1
52			min	0	1	0	1	0	1	-7.644e-06	4	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
53		2	max	0	1	.043	1	.001	4	6.089e-04	1	NC	2	NC	2
54			min	0	5	-.01	4	-.084	1	-4.095e-06	4	6305.781	1	3201.712	1
55		3	max	0	4	.054	1	.001	4	6.615e-04	1	NC	2	NC	2
56			min	0	1	-.013	4	-.104	1	-1.091e-06	4	4964.065	1	2589.876	1
57		4	max	0	4	.02	1	0	4	5.227e-04	1	NC	1	NC	2
58			min	0	1	-.007	4	-.058	1	7.038e-07	4	NC	1	4672.727	1
59		5	max	0	1	0	1	0	1	8.838e-05	1	NC	1	NC	1
60			min	0	1	0	1	0	1	-3.308e-06	4	NC	1	NC	1
61	M7	1	max	.066	1	.083	1	.027	4	5.005e-04	4	NC	1	NC	1
62			min	0	4	-.004	4	-.589	1	-1.065e-02	1	NC	1	NC	1
63		2	max	.066	1	.082	1	.027	4	4.962e-04	4	NC	1	NC	1
64			min	0	4	-.004	4	-.588	1	-1.082e-02	1	NC	1	NC	1
65		3	max	.066	1	.083	1	.027	4	4.919e-04	4	NC	1	NC	2
66			min	0	4	-.004	4	-.587	1	-1.099e-02	1	NC	1	7109.102	1
67		4	max	.066	1	.083	1	.026	4	4.875e-04	4	NC	1	NC	2
68			min	0	4	-.004	4	-.585	1	-1.115e-02	1	NC	1	7522.847	1
69		5	max	.066	1	.081	1	.026	4	4.832e-04	4	NC	1	NC	1
70			min	0	4	-.004	4	-.581	1	-1.132e-02	1	NC	1	NC	1
71	M8	1	max	.066	1	.081	1	.026	4	4.832e-04	4	NC	1	NC	1
72			min	0	4	-.004	4	-.581	1	-1.132e-02	1	NC	1	NC	1
73		2	max	.066	1	.076	1	.025	4	4.515e-04	4	NC	1	NC	2
74			min	0	4	-.004	4	-.553	1	-1.02e-02	1	NC	1	1890.767	1
75		3	max	.066	1	.073	1	.023	4	4.197e-04	4	NC	2	NC	2
76			min	0	4	-.004	4	-.506	1	-9.072e-03	1	7973.682	1	1640.131	1
77		4	max	.066	1	.067	1	.021	4	3.879e-04	4	NC	2	NC	2
78			min	0	4	-.003	4	-.444	1	-7.949e-03	1	6456.113	1	2663.256	1
79		5	max	.066	1	.053	1	.019	4	3.562e-04	4	NC	1	NC	1
80			min	0	4	-.003	4	-.376	1	-6.825e-03	1	NC	1	NC	1
81	M9	1	max	.08	1	.129	1	.045	4	5.947e-03	1	NC	1	NC	1
82			min	-.001	4	-.006	4	-.92	1	-2.756e-04	4	NC	1	NC	1
83		2	max	.08	1	.133	1	.044	4	6.244e-03	1	NC	2	NC	1
84			min	-.001	4	-.006	4	-.947	1	-2.756e-04	4	4969.028	1	NC	1
85		3	max	.08	1	.137	1	.044	4	6.542e-03	1	NC	2	NC	1
86			min	-.001	4	-.006	4	-.975	1	-2.757e-04	4	2481.594	1	NC	1
87		4	max	.08	1	.141	1	.044	4	6.84e-03	1	NC	2	NC	1
88			min	-.001	4	-.006	4	-1.002	1	-2.758e-04	4	1651.997	1	NC	1
89		5	max	.08	1	.145	1	.044	4	7.137e-03	1	NC	2	NC	1
90			min	-.001	4	-.006	4	-1.029	1	-2.759e-04	4	1237.375	1	NC	1
91	M10	1	max	.08	1	.145	1	.044	4	7.137e-03	1	NC	2	NC	1
92			min	-.001	4	-.006	4	-1.029	1	-2.759e-04	4	748.363	1	NC	1
93		2	max	.08	1	.129	1	.041	4	6.321e-03	1	NC	2	NC	2
94			min	-.001	4	-.006	4	-.926	1	-2.574e-04	4	1008.522	1	9703.428	1
95		3	max	.08	1	.113	1	.038	4	5.505e-03	1	NC	2	NC	2
96			min	-.001	4	-.006	4	-.819	1	-2.39e-04	4	1530.936	1	6857.474	1
97		4	max	.08	1	.098	1	.034	4	4.688e-03	1	NC	2	NC	2
98			min	-.001	4	-.005	4	-.709	1	-2.206e-04	4	3091.907	1	9671.503	1
99		5	max	.08	1	.084	1	.031	4	3.872e-03	1	NC	1	NC	1
100			min	-.001	4	-.004	4	-.596	1	-2.022e-04	4	NC	1	NC	1
101	M11	1	max	.021	1	.053	1	.019	4	1.161e-02	1	NC	1	NC	1
102			min	0	4	-.003	4	-.38	1	-5.684e-04	4	NC	1	NC	1
103		2	max	.021	1	.055	1	.018	4	1.183e-02	1	NC	1	NC	1
104			min	0	4	-.003	4	-.384	1	-5.633e-04	4	NC	1	NC	1
105		3	max	.021	1	.055	1	.018	4	1.205e-02	1	NC	1	NC	2
106			min	0	4	-.003	4	-.389	1	-5.582e-04	4	NC	1	5789.101	1
107		4	max	.021	1	.054	1	.018	4	1.228e-02	1	NC	1	NC	2
108			min	0	4	-.003	4	-.391	1	-5.531e-04	4	NC	1	6129.61	1
109		5	max	.021	1	.055	1	.018	4	1.25e-02	1	NC	1	NC	1
110			min	0	4	-.003	4	-.391	1	-5.481e-04	4	NC	1	NC	1
111	M12	1	max	.021	1	.055	1	.018	4	1.25e-02	1	NC	1	NC	1
112			min	0	4	-.003	4	-.391	1	-5.481e-04	4	NC	1	NC	1
113		2	max	.021	1	.054	1	.017	4	1.124e-02	1	NC	1	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
114			min	0	4	-.003	4	-.374	1	-5.095e-04	4	NC	1	2273.947	1
115		3	max	.021	1	.046	1	.016	4	9.983e-03	1	NC	1	NC	2
116			min	0	4	-.002	4	-.339	1	-4.709e-04	4	NC	1	2046.672	1
117		4	max	.021	1	.037	1	.014	4	8.725e-03	1	NC	1	NC	2
118			min	0	4	-.002	4	-.293	1	-4.323e-04	4	NC	1	3551.986	1
119		5	max	.021	1	.034	1	.013	4	7.468e-03	1	NC	1	NC	1
120			min	0	4	-.002	4	-.244	1	-3.937e-04	4	NC	1	NC	1
121	M13	1	max	0	1	0	1	0	1	1.257e-02	1	NC	1	NC	1
122			min	0	1	0	1	0	1	-6.169e-04	4	NC	1	NC	1
123		2	max	0	1	0	1	0	1	1.257e-02	1	NC	1	NC	1
124			min	0	1	0	4	0	4	-6.088e-04	4	NC	1	NC	1
125		3	max	0	1	0	1	0	4	1.257e-02	1	NC	1	NC	1
126			min	0	1	0	4	0	1	-6.007e-04	4	NC	1	NC	1
127		4	max	0	1	0	4	0	4	1.257e-02	1	NC	1	NC	1
128			min	0	1	0	1	0	1	-5.926e-04	4	NC	1	NC	1
129		5	max	0	1	0	1	0	1	1.257e-02	1	NC	1	NC	1
130			min	0	1	0	1	0	1	-5.846e-04	4	NC	1	NC	1
131	M14	1	max	0	1	0	1	0	1	1.257e-02	1	NC	1	NC	1
132			min	0	1	0	1	0	1	-5.846e-04	4	NC	1	NC	1
133		2	max	0	1	.002	1	0	6	1.143e-02	1	NC	1	NC	1
134			min	0	1	0	4	0	1	-5.439e-04	4	NC	1	NC	1
135		3	max	0	1	0	1	0	4	1.028e-02	1	NC	1	NC	1
136			min	0	1	0	5	-.002	1	-5.033e-04	4	NC	1	NC	1
137		4	max	0	1	0	4	0	4	9.14e-03	1	NC	1	NC	1
138			min	0	1	-.001	1	-.003	1	-4.627e-04	4	NC	1	NC	1
139		5	max	0	1	0	1	0	1	7.995e-03	1	NC	1	NC	1
140			min	0	1	0	1	0	1	-4.22e-04	4	NC	1	NC	1
141	M15	1	max	.066	1	.053	1	.019	4	3.562e-04	4	NC	2	NC	1
142			min	0	4	-.003	4	-.376	1	-6.825e-03	1	490.882	1	NC	1
143		2	max	.066	1	.04	1	.017	4	3.029e-04	4	NC	2	NC	1
144			min	0	4	-.002	4	-.288	1	-5.323e-03	1	655.174	1	NC	1
145		3	max	.066	1	.028	1	.014	4	2.496e-04	4	NC	2	NC	1
146			min	0	4	-.002	4	-.201	1	-3.82e-03	1	983.866	1	NC	1
147		4	max	.066	1	.016	1	.011	4	1.963e-04	4	NC	2	NC	1
148			min	0	4	-.002	4	-.114	1	-2.318e-03	1	1969.524	1	NC	1
149		5	max	.066	1	.004	1	.008	4	1.43e-04	4	NC	1	NC	1
150			min	0	4	-.001	4	-.027	1	-8.152e-04	1	NC	1	NC	1
151	M16	1	max	0	1	0	1	0	1	7.995e-03	1	NC	1	NC	1
152			min	0	1	0	1	0	1	-4.22e-04	4	NC	1	NC	1
153		2	max	0	1	0	1	.001	1	6.107e-03	1	NC	1	NC	1
154			min	0	1	0	4	0	4	-3.435e-04	4	NC	1	NC	1
155		3	max	0	1	0	2	.001	1	4.219e-03	1	NC	1	NC	1
156			min	0	1	0	1	0	4	-2.651e-04	4	NC	1	NC	1
157		4	max	0	1	0	4	0	1	2.331e-03	1	NC	1	NC	1
158			min	0	1	0	1	0	6	-1.866e-04	4	NC	1	NC	1
159		5	max	0	1	0	1	0	1	4.425e-04	1	NC	1	NC	1
160			min	0	1	0	1	0	1	-1.081e-04	4	NC	1	NC	1
161	M17	1	max	.021	1	.034	1	.013	4	7.468e-03	1	NC	2	NC	1
162			min	0	4	-.002	4	-.244	1	-3.937e-04	4	727.993	1	NC	1
163		2	max	.021	1	.026	1	.01	4	5.699e-03	1	NC	2	NC	1
164			min	0	4	-.002	4	-.185	1	-3.209e-04	4	972.12	1	NC	1
165		3	max	.021	1	.018	1	.008	4	3.931e-03	1	NC	2	NC	1
166			min	0	4	-.001	4	-.127	1	-2.48e-04	4	1460.614	1	NC	1
167		4	max	.021	1	.009	1	.006	4	2.162e-03	1	NC	2	NC	1
168			min	0	4	0	4	-.068	1	-1.752e-04	4	2925.18	1	NC	1
169		5	max	.021	1	.001	1	.003	4	3.935e-04	1	NC	1	NC	1
170			min	0	4	0	4	-.009	1	-1.024e-04	4	NC	1	NC	1
171	M18	1	max	.08	1	.084	1	.031	4	3.872e-03	1	NC	2	NC	1
172			min	-.001	4	-.004	4	-.596	1	-2.022e-04	4	300.761	1	NC	1
173		2	max	.08	1	.064	1	.026	4	3.037e-03	1	NC	2	NC	1
174			min	-.001	4	-.004	4	-.454	1	-1.748e-04	4	401.264	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
175		3	max	.08	1	.044	1	.021	4	2.201e-03	1	NC	2	NC	1
176			min	-.001	4	-.003	4	-.312	1	-1.475e-04	4	602.311	1	NC	1
177		4	max	.08	1	.024	1	.015	4	1.366e-03	1	NC	2	NC	1
178			min	-.001	4	-.002	4	-.17	1	-1.201e-04	4	1205.293	1	NC	1
179		5	max	.08	1	.004	1	.01	4	5.309e-04	1	NC	1	NC	1
180			min	-.001	4	-.001	4	-.028	1	-9.277e-05	4	NC	1	NC	1
181	M19	1	max	.021	1	.018	4	.003	4	7.458e-03	1	NC	1	NC	1
182			min	0	4	-.243	1	-.034	1	-5.559e-04	4	NC	1	NC	1
183		2	max	.021	1	.019	4	.004	4	8.581e-03	1	NC	1	NC	1
184			min	0	4	-.283	1	-.038	1	-5.784e-04	4	NC	1	NC	1
185		3	max	.021	1	.02	4	.005	4	9.703e-03	1	NC	1	NC	2
186			min	0	4	-.321	1	-.042	1	-6.008e-04	4	NC	1	7955.321	1
187		4	max	.021	1	.021	4	.004	4	1.083e-02	1	NC	1	NC	2
188			min	0	4	-.357	1	-.048	1	-6.233e-04	4	NC	1	4661.231	1
189		5	max	.021	1	.021	4	.003	4	1.195e-02	1	NC	1	NC	2
190			min	0	4	-.39	1	-.055	1	-6.458e-04	4	NC	1	3150.683	1
191	M20	1	max	.021	1	.021	4	.003	4	1.195e-02	1	NC	1	NC	1
192			min	0	4	-.39	1	-.055	1	-6.458e-04	4	NC	1	NC	1
193		2	max	.021	1	.021	4	.004	4	1.186e-02	1	NC	1	NC	1
194			min	0	4	-.39	1	-.053	1	-6.264e-04	4	NC	1	NC	1
195		3	max	.021	1	.02	4	.005	4	1.178e-02	1	NC	1	NC	1
196			min	0	4	-.389	1	-.052	1	-6.071e-04	4	NC	1	NC	1
197		4	max	.021	1	.019	4	.004	4	1.169e-02	1	NC	1	NC	1
198			min	0	4	-.385	1	-.052	1	-5.877e-04	4	NC	1	NC	1
199		5	max	.021	1	.019	4	.003	4	1.161e-02	1	NC	1	NC	1
200			min	0	4	-.38	1	-.053	1	-5.684e-04	4	NC	1	NC	1
201	M21	1	max	.051	1	.033	4	.005	4	5.981e-03	1	NC	1	NC	1
202			min	0	4	-.445	1	-.062	1	-4.35e-04	4	NC	1	NC	1
203		2	max	.051	1	.035	4	.006	4	6.858e-03	1	NC	1	NC	2
204			min	0	4	-.515	1	-.07	1	-4.505e-04	4	NC	1	8246.393	1
205		3	max	.051	1	.036	4	.007	4	7.736e-03	1	NC	1	NC	2
206			min	0	4	-.584	1	-.079	1	-4.659e-04	4	NC	1	3897.836	1
207		4	max	.051	1	.037	4	.007	4	8.613e-03	1	NC	1	NC	2
208			min	0	4	-.649	1	-.089	1	-4.814e-04	4	NC	1	2434.207	1
209		5	max	.051	1	.038	4	.006	4	9.49e-03	1	NC	1	NC	2
210			min	0	4	-.713	1	-.1	1	-4.968e-04	4	NC	1	1726.839	1
211	M22	1	max	.051	1	.038	4	.006	4	9.49e-03	1	NC	1	NC	1
212			min	0	4	-.713	1	-.1	1	-4.968e-04	4	NC	1	NC	1
213		2	max	.051	1	.037	4	.007	4	9.419e-03	1	NC	1	NC	1
214			min	0	4	-.711	1	-.098	1	-4.842e-04	4	NC	1	NC	1
215		3	max	.051	1	.036	4	.007	4	9.347e-03	1	NC	1	NC	1
216			min	0	4	-.707	1	-.096	1	-4.715e-04	4	NC	1	NC	1
217		4	max	.051	1	.035	4	.007	4	9.276e-03	1	NC	1	NC	1
218			min	0	4	-.7	1	-.096	1	-4.588e-04	4	NC	1	NC	1
219		5	max	.051	1	.034	4	.005	4	9.204e-03	1	NC	1	NC	1
220			min	0	4	-.692	1	-.097	1	-4.462e-04	4	NC	1	NC	1
221	M23	1	max	.081	1	.044	4	.006	4	3.866e-03	1	NC	1	NC	1
222			min	-.001	4	-.593	1	-.083	1	-2.673e-04	4	NC	1	NC	1
223		2	max	.081	1	.045	4	.008	4	4.386e-03	1	NC	1	NC	2
224			min	-.001	4	-.685	1	-.094	1	-2.738e-04	4	NC	1	5991.983	1
225		3	max	.081	1	.047	4	.009	4	4.907e-03	1	NC	1	NC	2
226			min	-.001	4	-.775	1	-.106	1	-2.804e-04	4	NC	1	2875.202	1
227		4	max	.081	1	.049	4	.008	4	5.427e-03	1	NC	1	NC	2
228			min	-.001	4	-.861	1	-.119	1	-2.869e-04	4	NC	1	1825.867	1
229		5	max	.081	1	.05	4	.007	4	5.948e-03	1	NC	1	NC	2
230			min	-.001	4	-.945	1	-.133	1	-2.934e-04	4	NC	1	1313.041	1
231	M24	1	max	.081	1	.05	4	.007	4	5.948e-03	1	NC	1	NC	1
232			min	-.001	4	-.945	1	-.133	1	-2.934e-04	4	NC	1	NC	1
233		2	max	.081	1	.049	4	.009	4	5.947e-03	1	NC	1	NC	1
234			min	-.001	4	-.943	1	-.13	1	-2.89e-04	4	NC	1	NC	1
235		3	max	.081	1	.048	4	.009	4	5.947e-03	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
236			min	-.001	4	-.938	1	-.129	1	-2.845e-04	4	NC	1	NC	1
237		4	max	.081	1	.046	4	.008	4	5.947e-03	1	NC	1	NC	1
238			min	-.001	4	-.93	1	-.128	1	-2.8e-04	4	NC	1	NC	1
239		5	max	.08	1	.045	4	.006	4	5.947e-03	1	NC	1	NC	1
240			min	-.001	4	-.92	1	-.129	1	-2.756e-04	4	NC	1	NC	1
241	M25	1	max	.066	1	.026	4	.004	4	4.87e-04	4	NC	1	NC	1
242			min	0	4	-.376	1	-.053	1	-6.869e-03	1	NC	1	NC	1
243		2	max	.066	1	.027	4	.004	4	5.016e-04	4	NC	2	NC	1
244			min	0	4	-.436	1	-.056	1	-7.797e-03	1	5199.497	1	NC	1
245		3	max	.066	1	.028	4	.005	4	5.163e-04	4	NC	2	NC	2
246			min	0	4	-.49	1	-.066	1	-8.725e-03	1	3443.328	1	4964.324	1
247		4	max	.066	1	.029	4	.004	4	5.309e-04	4	NC	2	NC	2
248			min	0	4	-.533	1	-.076	1	-9.653e-03	1	4271.739	1	2783.133	1
249		5	max	.066	1	.029	4	.004	4	5.455e-04	4	NC	1	NC	2
250			min	0	4	-.566	1	-.079	1	-1.058e-02	1	NC	1	2445.082	1
251	M26	1	max	.066	1	.029	4	.004	4	5.455e-04	4	NC	1	NC	1
252			min	0	4	-.566	1	-.079	1	-1.058e-02	1	NC	1	NC	1
253		2	max	.066	1	.029	4	.004	4	5.342e-04	4	NC	2	NC	1
254			min	0	4	-.585	1	-.079	1	-1.06e-02	1	4723.986	1	NC	1
255		3	max	.066	1	.029	4	.005	4	5.23e-04	4	NC	2	NC	1
256			min	0	4	-.593	1	-.083	1	-1.062e-02	1	4059.578	1	NC	1
257		4	max	.066	1	.028	4	.004	4	5.117e-04	4	NC	2	NC	1
258			min	0	4	-.593	1	-.086	1	-1.064e-02	1	6655.043	1	NC	1
259		5	max	.066	1	.027	4	.004	4	5.005e-04	4	NC	1	NC	1
260			min	0	4	-.589	1	-.083	1	-1.065e-02	1	NC	1	NC	1
261	M27	1	max	0	1	0	1	0	1	8.064e-03	1	NC	1	NC	1
262			min	0	1	0	1	0	1	-6.045e-04	4	NC	1	NC	1
263		2	max	0	1	.004	1	0	6	9.265e-03	1	NC	1	NC	2
264			min	0	1	0	4	-.007	1	-6.294e-04	4	NC	1	8760.61	1
265		3	max	0	1	0	1	0	4	1.047e-02	1	NC	1	NC	2
266			min	0	1	0	5	-.009	1	-6.542e-04	4	NC	1	6821.332	1
267		4	max	0	1	0	4	0	4	1.167e-02	1	NC	1	NC	1
268			min	0	1	-.002	1	-.005	1	-6.791e-04	4	NC	1	NC	1
269		5	max	0	1	0	1	0	1	1.287e-02	1	NC	1	NC	1
270			min	0	1	0	1	0	1	-7.039e-04	4	NC	1	NC	1
271	M28	1	max	0	1	0	1	0	1	1.287e-02	1	NC	1	NC	1
272			min	0	1	0	1	0	1	-7.039e-04	4	NC	1	NC	1
273		2	max	0	1	.002	1	0	6	1.279e-02	1	NC	1	NC	1
274			min	0	1	0	4	0	1	-6.821e-04	4	NC	1	NC	1
275		3	max	0	1	0	1	0	4	1.272e-02	1	NC	1	NC	1
276			min	0	1	0	5	-.002	1	-6.604e-04	4	NC	1	NC	1
277		4	max	0	1	0	4	0	4	1.265e-02	1	NC	1	NC	1
278			min	0	1	-.003	1	-.002	1	-6.386e-04	4	NC	1	NC	1
279		5	max	0	1	0	1	0	1	1.257e-02	1	NC	1	NC	1
280			min	0	1	0	1	0	1	-6.169e-04	4	NC	1	NC	1
281	M29	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
282			min	0	1	0	1	0	1	-8.374e-06	6	NC	1	NC	1
283		2	max	0	4	.02	6	0	1	4.452e-05	6	NC	1	NC	1
284			min	0	5	0	1	-.052	4	0	1	NC	1	9472.56	4
285		3	max	0	4	.028	6	0	1	5.861e-05	6	NC	1	NC	1
286			min	0	5	0	1	-.071	4	0	1	NC	1	6985.618	4
287		4	max	0	1	.02	6	0	1	3.955e-05	6	NC	1	NC	1
288			min	0	5	0	1	-.059	4	0	1	NC	1	8485.233	4
289		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
290			min	0	1	0	1	0	1	-7.007e-06	6	NC	1	NC	1
291	M30	1	max	0	1	0	1	0	1	1.658e-05	6	NC	1	NC	1
292			min	0	1	0	1	0	1	0	1	NC	1	NC	1
293		2	max	0	1	.023	6	0	1	2.678e-05	6	NC	1	NC	1
294			min	0	5	0	1	-.051	4	0	1	NC	1	9679.568	4
295		3	max	0	1	.032	6	0	5	3.081e-05	6	NC	1	NC	1
296			min	0	5	0	1	-.07	4	0	1	NC	1	7090.49	4

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
297		4	max	0	1	.023	6	0	5	2.852e-05	6	NC	1	NC	1
298			min	0	4	0	1	-.055	4	0	1	NC	1	9032.235	4
299		5	max	0	1	0	1	0	1	3.478e-06	6	NC	1	NC	1
300			min	0	1	0	1	0	1	0	1	NC	1	NC	1
301	M31	1	max	0	1	0	1	0	1	2.01e-06	6	NC	1	NC	1
302			min	0	1	0	1	0	1	0	1	NC	1	NC	1
303		2	max	0	4	.024	6	0	5	3.88e-06	6	NC	1	NC	1
304			min	0	5	0	1	-.051	4	0	1	NC	1	9660.132	4
305		3	max	0	4	.033	6	0	1	1.139e-05	6	NC	1	NC	1
306			min	0	5	0	1	-.071	4	0	1	NC	1	7020.893	4
307		4	max	0	4	.023	6	0	1	2.904e-06	6	NC	1	NC	1
308			min	0	5	0	1	-.054	4	0	1	NC	1	9138.367	4
309		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
310			min	0	1	0	1	0	1	-5.638e-07	6	NC	1	NC	1
311	M32	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
312			min	0	1	0	1	0	1	-7.174e-06	6	NC	1	NC	1
313		2	max	0	4	.023	6	0	1	0	1	NC	1	NC	1
314			min	0	5	0	1	-.051	4	-1.295e-05	6	NC	1	9696.373	4
315		3	max	0	4	.033	6	0	5	0	1	NC	1	NC	1
316			min	0	5	0	1	-.071	4	-2.395e-05	6	NC	1	7004.994	4
317		4	max	0	1	.023	6	0	5	0	1	NC	1	NC	1
318			min	0	5	0	1	-.052	4	-1.129e-05	6	NC	1	9624.662	4
319		5	max	0	1	0	1	0	1	8.082e-07	6	NC	1	NC	1
320			min	0	1	0	1	0	1	0	1	NC	1	NC	1
321	M33	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
322			min	0	1	0	1	0	1	-1.776e-05	6	NC	1	NC	1
323		2	max	0	1	.022	6	0	5	0	1	NC	1	NC	1
324			min	0	5	0	1	-.052	4	-2.628e-05	6	NC	1	9472.553	4
325		3	max	0	4	.031	6	0	1	0	1	NC	1	NC	1
326			min	0	5	0	1	-.071	4	-3.363e-05	6	NC	1	6969.062	4
327		4	max	0	4	.022	6	0	1	0	1	NC	1	NC	1
328			min	0	5	0	1	-.05	4	-2.426e-05	6	NC	1	9954.524	4
329		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
330			min	0	1	0	1	0	1	-7.386e-06	6	NC	1	NC	1
331	M34	1	max	0	1	0	1	0	1	3.733e-05	1	NC	1	NC	1
332			min	0	1	0	1	0	1	-1.436e-07	4	NC	1	NC	1
333		2	max	0	4	.002	6	.04	1	4.448e-05	1	NC	1	NC	2
334			min	0	1	-.003	1	-.009	4	0	4	NC	1	7202.593	1
335		3	max	0	1	.003	6	.045	1	8.491e-05	1	NC	1	NC	2
336			min	0	5	-.005	1	-.011	4	8.187e-07	4	NC	1	6538.805	1
337		4	max	0	1	.002	6	.03	1	8.955e-05	1	NC	1	NC	2
338			min	0	5	-.003	1	-.008	4	1.031e-06	4	NC	1	9686.301	1
339		5	max	0	1	0	1	0	1	3.081e-05	1	NC	1	NC	1
340			min	0	1	0	1	0	1	-9.965e-08	4	NC	1	NC	1
341	M35	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
342			min	0	1	0	1	0	1	-1.964e-04	6	NC	1	NC	1
343		2	max	0	1	0	1	0	6	0	1	NC	1	NC	1
344			min	0	1	-.004	4	0	1	-1.993e-04	6	NC	1	NC	1
345		3	max	0	1	0	1	0	6	0	1	NC	1	NC	1
346			min	0	1	-.002	4	0	1	-2.023e-04	6	NC	1	NC	1
347		4	max	0	1	.001	4	0	6	0	1	NC	1	NC	1
348			min	0	1	0	5	0	1	-2.052e-04	6	NC	1	NC	1
349		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
350			min	0	1	0	1	0	1	-2.082e-04	6	NC	1	NC	1
351	M36	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
352			min	0	1	0	1	0	1	-2.082e-04	6	NC	1	NC	1
353		2	max	0	1	0	1	0	6	0	1	NC	1	NC	1
354			min	0	1	-.002	4	0	1	-2.088e-04	6	NC	1	NC	1
355		3	max	0	1	0	4	0	6	0	1	NC	1	NC	1
356			min	0	1	0	5	0	1	-2.095e-04	6	NC	1	NC	1
357		4	max	0	1	.002	4	0	6	0	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
358			min	0	1	0	5	0	1	-2.102e-04	6	NC	1	NC	1
359		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
360			min	0	1	0	1	0	1	-2.108e-04	6	NC	1	NC	1
361	M37	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
362			min	0	1	0	1	0	1	-2.108e-04	6	NC	1	NC	1
363		2	max	0	1	0	1	0	6	0	1	NC	1	NC	1
364			min	0	1	-.002	4	0	1	-2.088e-04	6	NC	1	NC	1
365		3	max	0	1	0	1	0	6	0	1	NC	1	NC	1
366			min	0	1	0	4	0	1	-2.068e-04	6	NC	1	NC	1
367		4	max	0	1	.002	4	0	6	0	1	NC	1	NC	1
368			min	0	1	0	5	0	1	-2.048e-04	6	NC	1	NC	1
369		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
370			min	0	1	0	1	0	1	-2.027e-04	6	NC	1	NC	1
371	M38	1	max	0	1	0	1	0	1	0	1	NC	1	NC	1
372			min	0	1	0	1	0	1	-2.027e-04	6	NC	1	NC	1
373		2	max	0	1	0	1	0	1	0	1	NC	1	NC	1
374			min	0	1	-.003	4	0	6	-1.961e-04	6	NC	1	NC	1
375		3	max	0	1	0	4	0	1	0	1	NC	1	NC	1
376			min	0	1	0	5	0	6	-1.894e-04	6	NC	1	NC	1
377		4	max	0	1	.002	4	0	1	0	1	NC	1	NC	1
378			min	0	1	0	5	0	6	-1.827e-04	6	NC	1	NC	1
379		5	max	0	1	0	1	0	1	0	1	NC	1	NC	1
380			min	0	1	0	1	0	1	-1.761e-04	6	NC	1	NC	1
381	M39	1	max	0	1	.031	6	0	5	0	1	NC	1	NC	1
382			min	-.071	4	0	1	0	4	-1.618e-05	6	NC	1	NC	1
383		2	max	0	1	.031	6	.001	4	0	1	NC	1	NC	1
384			min	-.071	4	0	1	0	1	-1.651e-05	6	NC	1	NC	1
385		3	max	0	1	.032	6	.001	5	0	1	NC	1	NC	1
386			min	-.071	4	0	1	.001	4	-1.683e-05	6	NC	1	NC	1
387		4	max	0	1	.032	6	0	5	0	1	NC	1	NC	1
388			min	-.071	4	0	1	0	4	-1.716e-05	6	NC	1	NC	1
389		5	max	0	1	.032	6	0	5	0	1	NC	1	NC	1
390			min	-.071	4	0	1	0	4	-1.748e-05	6	NC	1	NC	1
391	M40	1	max	0	1	0	4	.033	6	0	1	NC	1	NC	1
392			min	-.07	4	0	5	0	1	-1.794e-05	6	NC	1	NC	1
393		2	max	0	1	0	1	.033	6	0	1	NC	1	NC	1
394			min	-.07	4	-.001	4	0	1	-1.76e-05	6	NC	1	NC	1
395		3	max	0	1	-.001	1	.032	6	0	1	NC	1	NC	1
396			min	-.07	4	-.001	4	0	1	-1.725e-05	6	NC	1	NC	1
397		4	max	0	1	0	1	.032	6	0	1	NC	1	NC	1
398			min	-.07	4	0	5	0	1	-1.691e-05	6	NC	1	NC	1
399		5	max	0	1	0	1	.032	6	0	1	NC	1	NC	1
400			min	-.07	4	0	5	0	1	-1.656e-05	6	NC	1	NC	1
401	M41	1	max	0	1	0	4	.028	6	0	1	NC	1	NC	1
402			min	-.062	4	0	5	0	1	-1.039e-04	6	NC	1	NC	1
403		2	max	0	1	0	1	.028	6	0	1	NC	1	NC	1
404			min	-.062	4	-.002	4	0	1	-1.043e-04	6	NC	1	NC	1
405		3	max	0	1	-.001	1	.028	6	0	1	NC	1	NC	1
406			min	-.062	4	-.001	4	0	1	-1.047e-04	6	NC	1	NC	1
407		4	max	0	1	0	4	.028	6	0	1	NC	1	NC	1
408			min	-.062	4	0	5	0	1	-1.051e-04	6	NC	1	NC	1
409		5	max	0	1	0	4	.028	6	0	1	NC	1	NC	1
410			min	-.062	4	0	5	0	1	-1.055e-04	6	NC	1	NC	1
411	M42	1	max	0	1	0	1	.027	6	0	1	NC	1	NC	1
412			min	-.065	4	0	5	0	1	-1.008e-04	6	NC	1	NC	1
413		2	max	0	1	0	1	.027	6	0	1	NC	1	NC	1
414			min	-.065	4	-.002	4	0	1	-9.815e-05	6	NC	1	NC	1
415		3	max	0	1	0	1	.026	6	0	1	NC	1	NC	1
416			min	-.065	4	-.001	4	0	1	-9.55e-05	6	NC	1	NC	1
417		4	max	0	1	0	4	.025	6	0	1	NC	1	NC	1
418			min	-.065	4	0	5	0	1	-9.285e-05	6	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
419		5	max	0	1	0	1	.024	6	0	1	NC	1	NC	1
420			min	-.065	4	0	5	0	1	-9.02e-05	6	NC	1	NC	1
421	M43	1	max	0	5	0	4	.017	6	0	1	NC	1	NC	1
422			min	-.043	4	0	5	0	1	-1.617e-04	6	NC	1	NC	1
423		2	max	0	5	0	1	.017	6	0	1	NC	1	NC	1
424			min	-.043	4	-.001	4	0	1	-1.643e-04	6	NC	1	NC	1
425		3	max	0	5	0	4	.018	6	0	1	NC	1	NC	1
426			min	-.043	4	0	5	0	1	-1.668e-04	6	NC	1	NC	1
427		4	max	0	5	0	4	.018	6	0	1	NC	1	NC	1
428			min	-.043	4	0	5	0	1	-1.693e-04	6	NC	1	NC	1
429		5	max	0	5	0	1	.018	6	0	1	NC	1	NC	1
430			min	-.043	4	0	4	0	1	-1.719e-04	6	NC	1	NC	1
431	M44	1	max	0	1	0	4	.018	6	0	1	NC	1	NC	1
432			min	-.046	4	0	5	0	1	-1.742e-04	6	NC	1	NC	1
433		2	max	0	1	0	1	.018	6	0	1	NC	1	NC	1
434			min	-.046	4	-.002	4	0	1	-1.725e-04	6	NC	1	NC	1
435		3	max	0	1	0	4	.018	6	0	1	NC	1	NC	1
436			min	-.046	4	0	5	0	1	-1.707e-04	6	NC	1	NC	1
437		4	max	0	1	0	4	.018	6	0	1	NC	1	NC	1
438			min	-.046	4	0	5	0	1	-1.69e-04	6	NC	1	NC	1
439		5	max	0	1	0	1	.017	6	0	1	NC	1	NC	1
440			min	-.046	4	0	4	0	1	-1.672e-04	6	NC	1	NC	1
441	M45	1	max	0	1	0	1	.012	6	1.811e-04	6	NC	1	NC	1
442			min	-.03	4	0	4	0	1	0	1	NC	1	NC	1
443		2	max	0	1	.001	4	.012	6	1.841e-04	6	NC	1	NC	1
444			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
445		3	max	0	1	0	4	.012	6	1.87e-04	6	NC	1	NC	1
446			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
447		4	max	0	1	0	1	.012	6	1.899e-04	6	NC	1	NC	1
448			min	-.03	4	0	4	0	1	0	1	NC	1	NC	1
449		5	max	0	1	0	4	.012	6	1.929e-04	6	NC	1	NC	1
450			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
451	M46	1	max	0	1	0	4	.012	6	1.929e-04	6	NC	1	NC	1
452			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
453		2	max	0	1	0	4	.012	6	1.936e-04	6	NC	1	NC	1
454			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
455		3	max	0	1	0	1	.012	6	1.943e-04	6	NC	1	NC	1
456			min	-.03	4	0	4	0	1	0	1	NC	1	NC	1
457		4	max	0	1	0	1	.012	6	1.95e-04	6	NC	1	NC	1
458			min	-.03	4	-.001	4	0	1	0	1	NC	1	NC	1
459		5	max	0	1	0	4	.012	6	1.957e-04	6	NC	1	NC	1
460			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
461	M47	1	max	0	1	0	4	.012	6	1.957e-04	6	NC	1	NC	1
462			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
463		2	max	0	1	0	4	.012	6	1.935e-04	6	NC	1	NC	1
464			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
465		3	max	0	1	0	4	.012	6	1.914e-04	6	NC	1	NC	1
466			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
467		4	max	0	1	0	1	.012	6	1.893e-04	6	NC	1	NC	1
468			min	-.03	4	0	4	0	1	0	1	NC	1	NC	1
469		5	max	0	1	0	1	.012	6	1.872e-04	6	NC	1	NC	1
470			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
471	M48	1	max	0	1	0	1	.012	6	1.872e-04	6	NC	1	NC	1
472			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
473		2	max	0	1	0	4	.012	6	1.817e-04	6	NC	1	NC	1
474			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
475		3	max	0	1	0	1	.011	6	1.762e-04	6	NC	1	NC	1
476			min	-.03	4	-.001	4	0	1	0	1	NC	1	NC	1
477		4	max	0	1	0	1	.011	6	1.707e-04	6	NC	1	NC	1
478			min	-.03	4	-.002	4	0	1	0	1	NC	1	NC	1
479		5	max	0	1	0	4	.01	6	1.653e-04	6	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
480			min	-.03	4	0	5	0	1	0	1	NC	1	NC	1
481	M49	1	max	0	1	0	1	.029	6	6.859e-05	6	NC	1	NC	1
482			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
483		2	max	0	1	0	4	.029	6	6.957e-05	6	NC	1	NC	1
484			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
485		3	max	0	1	0	4	.03	6	7.054e-05	6	NC	1	NC	1
486			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
487		4	max	0	1	0	1	.03	6	7.151e-05	6	NC	1	NC	1
488			min	-.07	4	0	4	0	1	0	1	NC	1	NC	1
489		5	max	0	1	0	4	.03	6	7.248e-05	6	NC	1	NC	1
490			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
491	M50	1	max	0	1	0	4	.03	6	7.248e-05	6	NC	1	NC	1
492			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
493		2	max	0	1	0	4	.031	6	7.272e-05	6	NC	1	NC	1
494			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
495		3	max	0	1	0	1	.031	6	7.296e-05	6	NC	1	NC	1
496			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
497		4	max	0	1	0	1	.031	6	7.32e-05	6	NC	1	NC	1
498			min	-.07	4	0	4	0	1	0	1	NC	1	NC	1
499		5	max	0	1	0	4	.031	6	7.344e-05	6	NC	1	NC	1
500			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
501	M51	1	max	0	1	0	4	.031	6	7.344e-05	6	NC	1	NC	1
502			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
503		2	max	0	1	0	4	.031	6	7.277e-05	6	NC	1	NC	1
504			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
505		3	max	0	1	0	4	.031	6	7.21e-05	6	NC	1	NC	1
506			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
507		4	max	0	1	0	1	.03	6	7.143e-05	6	NC	1	NC	1
508			min	-.07	4	0	4	0	1	0	1	NC	1	NC	1
509		5	max	0	1	0	1	.03	6	7.076e-05	6	NC	1	NC	1
510			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
511	M52	1	max	0	1	0	1	.03	6	7.076e-05	6	NC	1	NC	1
512			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
513		2	max	0	1	0	4	.029	6	6.893e-05	6	NC	1	NC	1
514			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
515		3	max	0	1	0	1	.028	6	6.71e-05	6	NC	1	NC	1
516			min	-.07	4	-.001	4	0	1	0	1	NC	1	NC	1
517		4	max	0	1	0	1	.027	6	6.528e-05	6	NC	1	NC	1
518			min	-.07	4	-.001	4	0	1	0	1	NC	1	NC	1
519		5	max	0	1	0	4	.026	6	6.345e-05	6	NC	1	NC	1
520			min	-.07	4	0	5	0	1	0	1	NC	1	NC	1
521	M53	1	max	0	1	0	1	0	1	-7.436e-07	4	NC	1	NC	1
522			min	0	1	0	1	0	1	-2.689e-05	1	NC	1	NC	1
523		2	max	0	6	.036	1	.001	4	5.778e-04	1	NC	2	NC	2
524			min	0	1	-.009	4	-.038	1	6.953e-06	4	7519.198	1	7075.379	1
525		3	max	0	4	.036	1	.001	4	6.13e-04	1	NC	2	NC	2
526			min	0	1	-.011	4	-.054	1	7.718e-06	4	7402.399	1	5014.673	1
527		4	max	0	4	.026	1	0	4	4.339e-04	1	NC	1	NC	2
528			min	0	1	-.008	4	-.038	1	5.958e-06	2	NC	1	7070.648	1
529		5	max	0	1	0	1	0	1	2.257e-05	1	NC	1	NC	1
530			min	0	1	0	1	0	1	7.25e-07	2	NC	1	NC	1
531	M54	1	max	0	1	0	1	0	1	-1.119e-05	2	NC	1	NC	1
532			min	0	1	0	1	0	1	-3.309e-04	1	NC	1	NC	1
533		2	max	0	1	.002	1	0	6	-1.067e-05	2	NC	1	NC	1
534			min	0	1	0	4	0	1	-3.581e-04	1	NC	1	NC	1
535		3	max	0	1	0	1	0	4	-1.015e-05	2	NC	1	NC	1
536			min	0	1	0	4	0	1	-3.853e-04	1	NC	1	NC	1
537		4	max	0	1	0	4	0	4	-8.797e-06	4	NC	1	NC	1
538			min	0	1	0	1	0	1	-4.125e-04	1	NC	1	NC	1
539		5	max	0	1	0	1	0	1	-6.177e-06	4	NC	1	NC	1
540			min	0	1	0	1	0	1	-4.397e-04	1	NC	1	NC	1

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
541	M55	1	max	.013	1	.001	1	.019	1	-7.97e-06	4	NC	1	NC	1
542			min	-.003	4	0	4	0	4	-8.217e-04	1	NC	1	NC	1
543		2	max	.013	1	.004	1	.018	1	-7.049e-06	4	NC	1	NC	1
544			min	-.003	4	0	4	0	4	-7.513e-04	1	NC	1	NC	1
545		3	max	.013	1	.002	1	.017	1	-6.128e-06	4	NC	1	NC	1
546			min	-.003	4	0	4	0	4	-6.81e-04	1	NC	1	NC	1
547		4	max	.013	1	0	1	.016	1	-5.208e-06	4	NC	1	NC	1
548			min	-.003	4	0	4	0	4	-6.106e-04	1	NC	1	NC	1
549		5	max	.013	1	.001	1	.016	1	-4.287e-06	4	NC	1	NC	1
550			min	-.003	4	0	4	0	4	-5.403e-04	1	NC	1	NC	1
551	M56	1	max	.042	1	.004	1	.074	1	-8.102e-06	4	NC	1	NC	1
552			min	-.01	4	-.001	4	0	4	-7.939e-04	1	NC	1	NC	1
553		2	max	.042	1	.008	1	.067	1	-7.49e-06	4	NC	1	NC	1
554			min	-.01	4	-.002	4	0	4	-6.875e-04	1	NC	1	NC	1
555		3	max	.042	1	.007	1	.058	1	-6.878e-06	4	NC	1	NC	1
556			min	-.01	4	-.002	4	0	4	-5.811e-04	1	NC	1	NC	1
557		4	max	.041	1	.005	1	.049	1	-6.266e-06	4	NC	1	NC	1
558			min	-.01	4	-.001	4	0	4	-4.747e-04	1	NC	1	NC	1
559		5	max	.041	1	.004	1	.041	1	-5.655e-06	4	NC	1	NC	1
560			min	-.01	4	-.001	4	0	4	-3.684e-04	1	NC	1	NC	1
561	M57	1	max	.038	1	.004	1	.06	1	8.393e-04	1	NC	1	NC	2
562			min	-.008	4	-.001	4	0	4	1.687e-05	4	NC	1	1135.883	1
563		2	max	.038	1	0	2	.051	1	7.265e-04	1	NC	2	NC	2
564			min	-.008	4	-.001	1	0	4	1.414e-05	4	8135.36	1	1497.034	1
565		3	max	.038	1	0	1	.041	1	6.137e-04	1	NC	1	NC	2
566			min	-.008	4	0	4	0	4	1.142e-05	4	NC	1	2342.692	1
567		4	max	.038	1	.004	1	.031	1	5.01e-04	1	NC	1	NC	2
568			min	-.008	4	-.001	4	0	4	8.699e-06	4	NC	1	5197.645	1
569		5	max	.038	1	.004	1	.023	1	3.882e-04	1	NC	1	NC	1
570			min	-.008	4	-.001	4	0	4	5.976e-06	4	NC	1	NC	1
571	M58	1	max	0	1	0	1	0	1	3.532e-04	1	NC	1	NC	1
572			min	0	1	0	1	0	1	6.721e-06	4	NC	1	NC	1
573		2	max	0	1	.007	1	.04	1	3.574e-04	1	NC	1	NC	2
574			min	0	5	0	4	-.009	4	6.606e-06	4	NC	1	7282.288	1
575		3	max	0	1	.01	1	.042	1	3.814e-04	1	NC	1	NC	2
576			min	0	5	0	4	-.011	4	5.951e-06	4	NC	1	7003.876	1
577		4	max	0	1	.007	1	.031	1	2.735e-04	1	NC	1	NC	2
578			min	0	5	0	4	-.008	4	3.997e-06	4	NC	1	9425.993	1
579		5	max	0	1	0	1	0	1	8.329e-07	4	NC	1	NC	1
580			min	0	1	0	1	0	1	-3.599e-05	1	NC	1	NC	1
581	M59	1	max	.038	1	.045	1	.004	1	-3.352e-07	4	NC	2	NC	1
582			min	-.01	4	0	4	0	4	-2.372e-04	1	1735.311	1	NC	1
583		2	max	.038	1	.035	1	.004	1	2.424e-07	4	NC	2	NC	1
584			min	-.01	4	0	4	0	4	-1.693e-04	1	2426.101	1	NC	1
585		3	max	.038	1	.027	1	.006	1	8.2e-07	4	NC	2	NC	1
586			min	-.01	4	0	4	-.001	4	-1.013e-04	1	3910.582	1	NC	1
587		4	max	.038	1	.019	1	.008	1	1.398e-06	4	NC	2	NC	1
588			min	-.01	4	0	4	-.002	4	-3.336e-05	1	8661.229	1	NC	1
589		5	max	.038	1	.012	1	.009	1	3.461e-05	1	NC	1	NC	1
590			min	-.01	4	0	4	-.002	4	-1.53e-05	6	NC	1	NC	1
591	M60	1	max	.04	1	.009	1	0	5	-4.474e-07	4	NC	2	NC	1
592			min	-.01	4	0	4	0	1	-5.171e-05	1	4896.756	1	NC	1
593		2	max	.04	1	.004	6	0	1	-2.419e-07	4	NC	2	NC	1
594			min	-.01	4	0	4	0	6	-3.35e-05	1	8199.093	1	NC	1
595		3	max	.04	1	.004	6	.002	1	-3.639e-08	4	NC	1	NC	1
596			min	-.01	4	0	4	0	4	-2.031e-05	6	NC	1	NC	1
597		4	max	.04	1	.003	6	.002	1	2.923e-06	1	NC	1	NC	1
598			min	-.01	4	-.002	1	0	4	-1.781e-05	6	NC	1	NC	1
599		5	max	.04	1	.003	6	0	5	2.113e-05	1	NC	1	NC	1
600			min	-.01	4	-.004	1	0	1	-1.532e-05	6	NC	1	NC	1
601	M61	1	max	.036	1	.001	4	.024	1	5.786e-04	1	NC	1	NC	2

Envelope Member Section Deflections (Continued)

	Member	Sec		x [in]	LC	y [in]	LC	z [in]	LC	x Rotate [r...	LC	(n) L/y Ratio	LC	(n) L/z Ratio	LC
602			min	-.008	4	-.008	1	0	4	5.789e-06	4	NC	1	2342.499	1
603		2	max	.036	1	.002	4	.019	1	4.837e-04	1	NC	1	NC	2
604			min	-.008	4	-.009	1	0	4	4.989e-06	4	NC	1	3246.052	1
605		3	max	.036	1	.002	4	.015	1	3.888e-04	1	NC	1	NC	2
606			min	-.008	4	-.011	1	0	4	4.19e-06	4	NC	1	5189.878	1
607		4	max	.036	1	.002	4	.011	1	2.939e-04	1	NC	1	NC	1
608			min	-.008	4	-.012	1	0	4	3.39e-06	4	NC	1	NC	1
609		5	max	.036	1	.003	4	.008	1	1.989e-04	1	NC	1	NC	1
610			min	-.008	4	-.012	1	0	4	2.591e-06	4	NC	1	NC	1
611	M62	1	max	.039	1	0	1	.006	1	8.596e-05	1	NC	1	NC	2
612			min	-.008	4	0	5	0	4	1.034e-06	4	NC	1	7107.672	1
613		2	max	.039	1	0	4	.003	6	5.497e-05	1	NC	1	NC	1
614			min	-.008	4	0	1	0	4	6.083e-07	4	NC	1	NC	1
615		3	max	.039	1	0	1	.002	6	3.64e-05	6	NC	1	NC	1
616			min	-.008	4	0	4	0	1	1.827e-07	4	NC	1	NC	1
617		4	max	.039	1	0	1	.002	6	3.207e-05	6	NC	1	NC	1
618			min	-.008	4	0	4	-.002	1	-7.017e-06	1	NC	1	NC	1
619		5	max	.039	1	0	4	.002	6	2.775e-05	6	NC	1	NC	1
620			min	-.008	4	0	1	-.003	1	-3.801e-05	1	NC	1	NC	1
621	M63	1	max	.011	1	.017	1	.003	1	5.54e-06	4	NC	2	NC	1
622			min	-.003	4	0	4	0	4	-5.124e-04	1	5410.91	1	NC	1
623		2	max	.011	1	.013	1	.001	1	5.297e-06	4	NC	2	NC	1
624			min	-.003	4	0	4	0	4	-4.042e-04	1	7878.696	1	NC	1
625		3	max	.011	1	.01	1	.004	1	5.054e-06	4	NC	1	NC	1
626			min	-.003	4	0	4	0	4	-2.959e-04	1	NC	1	NC	1
627		4	max	.011	1	.007	1	.006	1	4.81e-06	4	NC	1	NC	1
628			min	-.003	4	0	4	-.001	4	-1.877e-04	1	NC	1	NC	1
629		5	max	.011	1	.004	1	.004	1	4.567e-06	4	NC	1	NC	1
630			min	-.003	4	0	4	-.001	4	-7.942e-05	1	NC	1	NC	1
631	M64	1	max	.012	1	.003	1	0	5	-1.038e-06	4	NC	1	NC	1
632			min	-.003	4	0	4	0	1	-1.028e-04	1	NC	1	NC	1
633		2	max	.012	1	.002	1	0	4	-5.757e-07	4	NC	1	NC	1
634			min	-.003	4	0	4	0	1	-6.536e-05	1	NC	1	NC	1
635		3	max	.012	1	.002	6	.001	1	-1.138e-07	4	NC	1	NC	1
636			min	-.003	4	0	4	0	4	-4.406e-05	6	NC	1	NC	1
637		4	max	.012	1	.001	6	.002	1	9.487e-06	1	NC	1	NC	1
638			min	-.003	4	0	1	0	4	-3.894e-05	6	NC	1	NC	1
639		5	max	.012	1	.001	6	0	5	4.691e-05	1	NC	1	NC	1
640			min	-.003	4	-.001	1	0	1	-3.383e-05	6	NC	1	NC	1
641	M65	1	max	0	1	0	1	0	1	1.814e-06	4	NC	1	NC	1
642			min	0	1	0	1	0	1	-4.549e-04	1	NC	1	NC	1
643		2	max	0	1	0	1	0	4	3.421e-06	4	NC	1	NC	1
644			min	0	1	0	4	-.001	1	-3.778e-04	1	NC	1	NC	1
645		3	max	0	1	0	4	0	2	5.027e-06	4	NC	1	NC	1
646			min	0	1	-.002	1	0	1	-3.006e-04	1	NC	1	NC	1
647		4	max	0	1	0	4	0	6	6.634e-06	4	NC	1	NC	1
648			min	0	1	-.003	1	0	1	-2.235e-04	1	NC	1	NC	1
649		5	max	0	1	0	1	0	1	8.241e-06	4	NC	1	NC	1
650			min	0	1	0	1	0	1	-1.464e-04	1	NC	1	NC	1
651	M66	1	max	0	1	0	1	0	1	-1.242e-06	4	NC	1	NC	1
652			min	0	1	0	1	0	1	-1.066e-04	1	NC	1	NC	1
653		2	max	0	1	.002	1	0	1	-7.183e-07	4	NC	1	NC	1
654			min	0	1	0	4	0	4	-6.761e-05	1	NC	1	NC	1
655		3	max	0	1	0	4	0	1	-1.942e-07	4	NC	1	NC	1
656			min	0	1	0	1	0	4	-4.691e-05	6	NC	1	NC	1
657		4	max	0	1	0	4	0	1	1.033e-05	1	NC	1	NC	1
658			min	0	1	-.003	1	0	4	-4.154e-05	6	NC	1	NC	1
659		5	max	0	1	0	1	0	1	4.93e-05	1	NC	1	NC	1
660			min	0	1	0	1	0	1	-3.616e-05	6	NC	1	NC	1

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	.002	5	3.885	5	.032	1	0	1	0	1	0	1
2		min	-.206	6	3.56	1	-.214	4	0	1	0	1	0	1
3	N2	max	.122	1	.488	1	1.511	1	0	1	0	1	0	1
4		min	-.014	6	.357	4	-.021	4	0	1	0	1	0	1
5	N3	max	.004	4	.546	1	.473	1	0	1	0	1	0	1
6		min	-.14	1	.12	4	-.002	4	0	1	0	1	0	1
7	N4	max	.108	1	.459	5	2.276	1	0	1	0	1	0	1
8		min	-.031	6	.074	1	-.031	4	0	1	0	1	0	1
9	N5	max	.03	1	.618	1	1.976	1	0	1	0	1	0	1
10		min	-.026	6	.525	4	-.017	4	0	1	0	1	0	1
11	N6	max	.034	1	3.557	5	1.414	1	0	1	0	1	0	1
12		min	-.181	6	3.098	1	-.195	4	0	1	0	1	0	1
13	N7	max	.009	4	3.875	5	.034	5	0	1	0	1	0	1
14		min	-.196	6	3.632	6	-.321	1	0	1	0	1	0	1
15	N8	max	.046	1	.47	1	1.748	1	0	1	0	1	0	1
16		min	-.029	6	.391	4	-.03	4	0	1	0	1	0	1
17	N9	max	.002	4	.167	4	.383	1	0	1	0	1	0	1
18		min	-.4	1	-.685	1	.003	6	0	1	0	1	0	1
19	N10	max	.072	1	1.601	1	2.296	1	0	1	0	1	0	1
20		min	-.032	6	.509	4	-.042	4	0	1	0	1	0	1
21	N11	max	.306	1	.721	5	2.336	1	0	1	0	1	0	1
22		min	-.012	6	.682	4	-.037	4	0	1	0	1	0	1
23	N12	max	.181	1	3.646	5	1.162	1	0	1	0	1	0	1
24		min	-.176	6	3.453	4	-.192	4	0	1	0	1	0	1
25	N34	max	.033	1	1.832	1	.211	1	0	1	0	1	0	1
26		min	-.081	6	1.672	6	-.091	4	0	1	0	1	0	1
27	N35	max	.041	1	1.673	5	.088	1	0	1	0	1	0	1
28		min	-.085	6	1.573	4	-.071	4	0	1	0	1	0	1
29	N36	max	0	1	8.121	5	-.003	1	0	1	0	1	0	1
30		min	-.431	6	7.691	1	-.424	4	0	1	0	1	0	1
31	N37	max	0	1	1.46	5	0	5	0	1	0	1	0	1
32		min	-.077	6	1.348	4	-.08	4	0	1	0	1	0	1
33	N38	max	0	1	1.446	5	0	1	0	1	0	1	0	1
34		min	-.077	6	1.357	4	-.077	4	0	1	0	1	0	1
35	N39	max	0	1	1.46	5	0	1	0	1	0	1	0	1
36		min	-.074	6	1.383	1	-.081	4	0	1	0	1	0	1
37	N40	max	0	1	8.099	5	.003	5	0	1	0	1	0	1
38		min	-.432	6	7.541	4	-.418	4	0	1	0	1	0	1
39	N45	max	0	1	8.128	5	.005	5	0	1	0	1	0	1
40		min	-.431	6	7.543	4	-.425	4	0	1	0	1	0	1
41	N44	max	0	1	1.43	5	-.002	1	0	1	0	1	0	1
42		min	-.076	6	1.354	1	-.088	4	0	1	0	1	0	1
43	N43	max	0	1	1.426	5	.003	5	0	1	0	1	0	1
44		min	-.076	6	1.258	4	-.089	4	0	1	0	1	0	1
45	N42	max	0	1	1.466	4	-.003	1	0	1	0	1	0	1
46		min	-.074	6	1.355	1	-.093	4	0	1	0	1	0	1
47	N41	max	0	1	8.083	5	-.002	1	0	1	0	1	0	1
48		min	-.43	6	7.655	1	-.404	4	0	1	0	1	0	1
49	N46	max	.04	1	1.751	5	.137	1	0	1	0	1	0	1
50		min	-.09	6	1.437	1	-.115	4	0	1	0	1	0	1
51	N71	max	.005	5	1.543	5	.303	1	0	1	0	1	0	1
52		min	-.081	6	1.455	6	-.089	4	0	1	0	1	0	1
53	N75	max	-.002	4	2.074	5	.094	1	0	1	0	1	0	1
54		min	-.123	6	1.849	1	-.095	4	0	1	0	1	0	1
55	N76	max	-.006	2	2.878	5	.263	1	0	1	0	1	0	1
56		min	-.16	6	2.553	1	-.183	4	0	1	0	1	0	1
57	Totals:	max	0	1	71.115	5	16.38	1						
58		min	-3.771	6	67.343	2	-3.771	4						

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	NYC BC eq. ...	Yes	Y		DL	1	WLZ	1																
2	NYC BC eq. ...	Yes	Y		DL	1	W...	1																
3	NYC BC eq. ...	Yes	Y		DL	1	W...	1																
4	NYC BC eq. ...	Yes	Y		DL	1	ELZ	.7																
5	NYC BC eq. ...	Yes	Y		DL	1	ELY	.7																
6	NYC BC eq. ...	Yes	Y		DL	1	ELX	.7																

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead Load	DL		-1						
2	E horizontal X	ELX	.08							
3	E vertical Y	ELY		-.08						
4	E horizontal Z	ELZ			.08					
5	BLC 9 Transient Area...	None						101		
7	Wind X	WLX							4	
8	Wind Y	WLY								
9	Wind Z	WLZ							1	

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	HR_STL	29000	11154	.3	.65	.49	36	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(a)STLG.001 verti...	(a)STLG.001 vertical	Column	Wide Flange	HR_STL	Typical	13.861	7.5	228.368	3.515
2	(e)STLG.005 verti...	HSS4x4x3-A1085	Column	SquareTub...	HR_STL	Typical	2.78	6.61	6.61	10.7
3	(f)STLG.006 verti...	HSS4x4x4-A1085	Column	SquareTub...	HR_STL	Typical	3.59	8.22	8.22	13.5
4	(h)STLG.007 hori...	HSS2.5x2.5x4-A10...	Beam	SquareTub...	HR_STL	Typical	2.09	1.69	1.69	2.92
5	(b)STLG.002 Hori...	(b)STLG.002 H	Beam	Wide Flange	HR_STL	Typical	6.719	7.055	11.72	1.674
6	(c)STLG.003 verti...	C Vertical	Column	Wide Flange	HR_STL	Typical	8.692	7.216	32.168	2.377
7	(d)STLG.004 verti...	(d)STLG.004 vertical	Column	Wide Flange	HR_STL	Typical	16	7.947	257.946	5.385

Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[K]
1	Hot Rolled Steel				
2	HR_STL	(a)STLG.001 vertical	2	48.6	2.3
3	HR_STL	(b)STLG.002 H	28	148.5	3.4
4	HR_STL	(d)STLG.004 vertical	5	207	11.3
5	HR_STL	C Vertical	4	90	2.7
6	HR_STL	HSS2.5x2.5x4-A1085	24	87.4	.6
7	HR_STL	HSS4x4x3-A1085	1	22.5	.2
8	HR_STL	HSS4x4x4-A1085	2	45	.5
9	Total HR Steel		66	649	21