



Planning & Building Agency  
 Building Safety Division  
 20 Civic Center Plaza  
 P.O. Box 1988 (M-19)  
 Santa Ana, CA 92702  
 (714) 647-5800  
 www.santa-ana.org

**DISABLED ACCESS COMPLIANCE  
 DOCUMENTATION FORM**

ACC-01 CBC 2010

**A. PURPOSE OF THIS DOCUMENTATION:**

- Finding of unreasonable hardship for projects under \$132,536.28 (as of January 2011) per 2010 California Building Code (CBC) Section 1134B.2.1, Exception 1
- Full Compliance with the 2010 California Building Code

**B. PROJECT INFORMATION TO BE COMPLETED BY PETITIONER:**

Project Address: <u>1918 E. Glenwood Place</u>	Project Number: <u>10173637</u>
Project Description: <u>Voluntary Seismic Strengthening @ Roof</u>	Total Construction Cost: <u>\$ 23,750.00</u>
Occupancy Classification/Use: <u>B, S-1</u>	Number of Stories: <u>1</u>

1. Business Name: Harvey's
2. Legal Property Owner: Rob Socci Phone No. (714) 935-2200
3. The cost of all construction contemplated in the determination of the valuation of improvement threshold based on the valuation of site and building improvements for the last three-year period (from \_\_\_/\_\_\_/\_\_\_ to \_\_\_/\_\_\_/\_\_\_). References:

Permit No.	Issuance Date	Valuation of Improvements
Total:		

4. The minimum amount to be spent to provide disabled access under the subject building permit application (20% of Total Construction Cost / Project Valuation): \$23,750 x 20% = \$4,750

5. Describe the impact of the proposed improvements on financial feasibility of the project:

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6. Describe the nature of accessibility that would be gained or lost with the proposed improvements:

HC parking will be upgraded to current standards  
Restroom lavatory/cabinet replaced w/ new "accessible sinks  
Replacement of doorknobs to 'lever-type' hardware

7. Identify the accessibility features and equivalent facilities that **WILL** be brought into compliance with the latest edition of Title 24 as a part of this project and an estimate of the cost of each item: *(Documentation may be required)*

Accessible Features to be Made Accessible	Cost of Improvement
a. Entrance:	
<input type="checkbox"/> Ramp <input type="checkbox"/> Door <input type="checkbox"/> Landing <input type="checkbox"/> Stair/Steps	\$
b. Path of Travel:	
<input type="checkbox"/> Path of travel from building entrance to the area of remodel	\$
<input type="checkbox"/> Path of travel from the public way to the building entrance	\$
<input checked="" type="checkbox"/> Path of travel from accessible parking to the building entrance	\$ 2,500 <sup>-</sup>
<input type="checkbox"/> Path of travel to sanitary facilities / public phone / drinking fountain	\$
c. Sanitary facilities ( Floor no. )	\$ 1,350 <sup>-</sup>
d. Public phone(s)	\$
e. Drinking fountain(s)	\$
f. Parking	\$
g. Signage	\$
h. <del>Alarms</del> hardware replacement	\$ 900
i. Other	\$
<b>Total:</b>	<b>\$ 4,750<sup>-</sup></b>

8. Identify the accessibility features that **WILL NOT** comply if a request for unreasonable hardship is granted. Provide an estimated cost of compliance for each item: *(Documentation may be required)*

Accessible Features Not to be Improved	Cost of Improvement
a.	\$
b.	\$
c.	\$
<b>Total:</b>	<b>\$</b>

9. **Petitioner must be the legal property owner or his/her legal representative:**

I certify that the above noted information is true and correct.

Legal Property Owner  Architect/Engineer  Contractor  Other \_\_\_\_\_

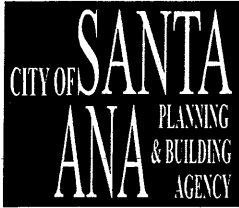
Print Name: Michael Santillan Phone No. 714-803-8454

Address: 27 Orchard, Lake Forest, CA 92630

Signature: Michael Santillan Date: 12/5/11

**FOR AGENCY USE ONLY**

Approved by: \_\_\_\_\_ Date: \_\_\_\_\_



Planning & Building Agency  
 Permits & Plan Check Section  
 20 Civic Center Plaza  
 P.O. Box 1988 (M-19)  
 Santa Ana, CA 92702  
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## ACCELERATED PLAN CHECK REQUEST

HO18: 07-01-11

Project Address: 1918 E Glenwood

Misc. Receipt: 58392 Processed By: [Signature] Plan Checked By: \_\_\_\_\_

Cost: \$117.70 per hour for each discipline. The plan checker will estimate the number of hours for review. This fee is in addition to the regular plan check fee.

Type of Plan Check: Building 10173637 Electrical \_\_\_\_\_  
 Est. Hrs. 2 Actual 2<sup>m</sup> Est. Hrs. \_\_\_\_\_ Actual \_\_\_\_\_  
 Plumbing \_\_\_\_\_ Mechanical \_\_\_\_\_  
 Est. Hrs. \_\_\_\_\_ Actual \_\_\_\_\_ Est. Hrs. \_\_\_\_\_ Actual \_\_\_\_\_

Owner/Representative Signature: [Signature]

Print Name: Michael Santillan Date: 11/15/10

Telephone Number: (714) 803-8454 Fax Number: ( )

MS An accelerated plan check review will not include the following:  
**Fire, Police, Public Works, Planning or Landscaping Plan Check**

Revisions: If requesting an "accelerated revision", the cost will be \$207.25 per hour in addition to the accelerated fee of \$117.70 per hour (total \$324.95).

**INTERNAL USE ONLY**

Name (Last, First, Initial)		Employee #		Division	
From (Date & Time)	To (Date & Time)	Total Hours Worked		_____ Comp Time Requested _____ Overtime Requested	
Employee Signature: _____ Date: _____					
AUTHORIZED _____ Comp time _____ Overtime Immediate Supervisor _____ Date _____			APPROVALS _____ Division Manager _____ Date _____ Executive Director _____ Date _____		

823K

# CITY OF SANTA ANA

## BUILDING PERMIT WORKSHEET

PLEASE PRINT

1/14/09:forms/Bldg.App.Worksheet

PROJECT ADDRESS: 1918 E. Glenwood		SUITE: B	SAPIN # 10173637	
USE OF BUILDING:	RESIDENTIAL	<u>COMMERCIAL</u>	INDUSTRIAL	OTHER
				MASTER ID#
NATURE OF WORK:	NEW	ADD	<u>ALTER/T.I.</u>	DEMO REROOF REPAIR SIGN MISC
NEW/ADDITION/ALTERATION:				
1ST FL..	_____ SF	BASEMENT: YES/NO	_____ SF	NO. OF STORIES: _____
2ND FL..	_____ SF	PATIO/ENCL. PATIO:	_____ SF	BLDG. HEIGHT: _____
TOTAL OF OTHER FLS:	_____ SF	RES. REMODEL:	_____ SF	PROPOSED USE: _____
GARAGE/CARPORT:	_____ SF	ALTER/T.I.:	_____ SF	
JOB DESCRIPTION (non-residential projects see reverse side of this application): <u>Voluntary Seismic Retrofit @ roof of existing 1-story bldg.</u>				
BUILDING OWNER'S NAME: Rob Soeci			PHONE NO: 714)935-2314	
ADDRESS: 3500 W. Orangewood Ave	CITY: Orange		STATE: CA	ZIP: 92868
TENANT'S NAME (Comm/Ind):			PHONE NO:	
CONTRACTOR'S NAME:		STATE CONTR. #:	LICENSE CLASS:	PHONE NO:
ADDRESS:		CITY:	STATE:	ZIP:
WORKERS COMP. POLICY#:	EXP. DATE:	INSURANCE COMPANY:	SANTA ANA BUS. LIC. #:	
ARCHITECT/ <u>ENGINEER</u> : Michael O'Brien	STATE LICENSE #: 5-004468		PHONE NO: 949)716-9990	
ADDRESS: 27 Orchard	CITY: Lake Forest		STATE: CA	ZIP: 92630
CONTACT NAME: Michael Santillan			PHONE NO: 714 803 8454	
E-MAIL ADDRESS: Michael.Santillan@nationaleng.com FAX NO: 949 716-9997				

OFFICE USE ONLY: ACC OR SPC (CIRCLE ONE) \_\_\_\_\_ HRS PER \_\_\_\_\_ BLDG. FEE \$ \_\_\_\_\_

OCC. GROUP: \_\_\_\_\_ RECEIPT #: 58357 P/C FEE PD \$ 20725

TYPE OF CONSTR: \_\_\_\_\_ VALUATION: \$ 23,000 SUBMITTAL DATE: 11/7

FIRE SPKR: YES / NO A/C: YES / NO FLOOD ZONE: \_\_\_\_\_ PROCESSED 14/

RES. DEV. FEE: YES / NO PRIOR DWELLING UNIT: YES / NO COMMENTS: \_\_\_\_\_

PLANNING OK TO CHECK & DATE \_\_\_\_\_ BLDG. DEPT. APPROVAL & DATE \_\_\_\_\_

PLNG CONDITIONS: \_\_\_\_\_

## PLEASE CHECK ALL THAT APPLY TO YOUR PROJECT

### JOB DESCRIPTION CHECKLIST:

- |  |   |
|--|---|
| <input type="checkbox"/> Additional square footage           | <input type="checkbox"/> Partition walls                      |
| <input type="checkbox"/> Awnings                             | <input type="checkbox"/> Rated corridors                      |
| <input type="checkbox"/> Canopy                              | <input type="checkbox"/> Rated shafts                         |
| <input type="checkbox"/> Ceiling work                        | <input type="checkbox"/> Roof mounted equipment               |
| <input type="checkbox"/> Change of occupancy (use)           | <input type="checkbox"/> Security bars                        |
| <input type="checkbox"/> Disabled accessible (H/C) restrooms | <input type="checkbox"/> Screening for equipment              |
| <input type="checkbox"/> Dust collector                      | <input type="checkbox"/> Skylights                            |
| <input type="checkbox"/> Elevator shaft                      | <input type="checkbox"/> Stairs                               |
| <input type="checkbox"/> Exterior doors or windows           | <input type="checkbox"/> Storefront/facade improvements       |
| <input type="checkbox"/> Equipment pads                      | <input type="checkbox"/> Storage racks or shelving over 5'-9" |
| <input type="checkbox"/> Interior demo                       | <input type="checkbox"/> Walk-in coolers                      |
| <input type="checkbox"/> Kitchen equipment                   |   |

### ITEMS REQUIRING SEPARATE BUILDING PERMIT APPLICATIONS:

- Block wall
- Card readers
- Complete demo
- Fence
- Fire signaling system
- Fire sprinklers
- Flagpole
- Lawn sprinkler system
- Light Standards
- Parking lot repaving
- Parking lot restriping
- Pedestrian protection
- Pool/Spa
- Signs
- Spray booth
- Temporary power pole
- Trash enclosure

# FEE CHECKLIST WORKSHEET

Received by:           KH          

SAPIN #:           10173637          

<u>FEE TYPE</u>	<u>REQUIRED</u>	
	Yes	No
Plan Check Fee	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Disability Fee	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SMIP Fee	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Res. Dev. Fee	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Fire Facility Fee	<input type="checkbox"/>	<input checked="" type="checkbox"/>
School Distr. Fee	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Microfilm	<input type="checkbox"/>	<input checked="" type="checkbox"/>
FCWP Surcharge	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### CALCULATION AREA

COST/SQ FT            X            TOTAL SQ FT            =            VALUATION

*per applicant*

Counter computations/valuation \$           23,000          

Plan checker computation/final valuation \$ \_\_\_\_\_

# FEE CHECKLIST WORKSHEET

Received by: \_\_\_\_\_

SAPIN #: \_\_\_\_\_

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<u>FEE TYPE</u>	<u>REQUIRED</u>	
	Yes	No
Plan Check Fee	<input type="checkbox"/>	<input type="checkbox"/>
Disability Fee	<input type="checkbox"/>	<input type="checkbox"/>
SMIP Fee	<input type="checkbox"/>	<input type="checkbox"/>
Res. Dev. Fee	<input type="checkbox"/>	<input type="checkbox"/>
Fire Facility Fee	<input type="checkbox"/>	<input type="checkbox"/>
School Distr. Fee	<input type="checkbox"/>	<input type="checkbox"/>
Microfilm	<input type="checkbox"/>	<input type="checkbox"/>
FCWP Surcharge	<input type="checkbox"/>	<input type="checkbox"/>

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## CALCULATION AREA

COST/SQ FT            X            TOTAL SQ FT            =            VALUATION

Counter computations/valuation \$ \_\_\_\_\_

Plan checker computation/final valuation \$ \_\_\_\_\_



**Structural Calculations**  
**Roof Seismic Strengthening - Partial**  
**Concrete Tilt-up Building**  
**1918 E Glenwood Place (Bldg D)**  
**Santa Ana, CA**

**R E C E I V E D**

R-Voit-01D

NOV 07 2011

City of Santa Ana



**Revision**  
**0**

**October 11, 2011**

27 Orchard, Suite 200  
Lake Forest, CA 92630  
Phone: (949) 716-9990 Fax: (949) 716-9997  
[www.national-eng.com](http://www.national-eng.com)

The structural calculations contained in this report relate only to the structure and site for which they were prepared. Referenced building codes, site-specific parameters for wind and seismic design, and any cited material/component design standards are current only for the governmental agency with jurisdiction over the design and construction of the proposed structure at the time the report was published. Some information utilized in the structural calculations may have been received from outside sources such as third party site development coordinators, geotechnical engineering reports, pre-engineered component manufacturers, or engineering/trade organizations. NEC is not responsible for the accuracy and/or changes to any information utilized herein as provided by outside sources.



## Scope

THE PROJECT CONSISTS OF A LIMITED SEISMIC STRENGTHENING OF AN EXISTING INDUSTRIAL BUILDING. THE SCOPE OF THE PROJECT IS LIMITED TO THE REQUIREMENTS OF CHAPTER A2 OF THE INTERNATIONAL EXISTING BUILDING CODE AT THE ROOF LEVEL ONLY INCLUDING WALL ANCHORAGE, CONTINUITY TIES, AND DRAGS.

THERE IS NO MEZZANINE

THE BUILDING CONSISTS OF A CONCRETE TILT-UP BUILDING WITH A PANELIZED ROOF CONSISTING OF A PLYWOOD DIAPHRAGM SUPPORTED ON 2X RAFTERS SUPPORTED ON 4X PURLINS THAT SPAN TO GLULAM BEAMS. ORIGINAL BUILDING AGE AND BUILDING CODE WAS NOT DETERMINED BUT IS REPORTED TO PRE-DATE THE MID-1970'S.

THERE IS CURRENTLY NO KNOWN JURISDICTIONAL MANDATE FOR SEISMIC STRENGTHENING FOR THIS BUILDING.

STORY DRIFT, DIAPHRAGM STRENGTH, WALL STRENGTHS, ETC. ARE OUT OF SCOPE AND NOT ADDRESSED.

**3404.5 Voluntary seismic improvements.** Alterations to existing structural elements or additions of new structural elements that are not otherwise required by this chapter and are initiated for the purpose of improving the performance of the seismic force-resisting system of an *existing structure* or the performance of seismic bracing or anchorage of existing nonstructural elements shall be permitted, provided that an engineering analysis is submitted demonstrating the following:

1. The altered structure and the altered nonstructural elements are no less in compliance with the provisions of this code with respect to earthquake design than they were prior to the *alteration*.
2. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

JOB NAME: <b>1918 E Glenwood Place</b>	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>G - 2</b>
	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>General</b>		

## Design Criteria

**I. Code**

- A. Chapter A2 of the 2009 International Existing Building Code

**II. Lateral Loads**

Wind - Not Applicable

**III. Allowable Stresses for New Materials**

A. Structural Masonry

Walls..... Not Applicable

B. Concrete

(E) Wall panels & Columns ..... f 'c = 2,500 psi at 28 Days Assumed  
 (E) Slab on grade..... f 'c = 2,000 psi at 28 Days Assumed

C. Reinforcing Steel

Slabs & Footings ..... ASTM A615, Fy = 60 ksi  
 Welded Bars ..... ASTM A706, Fy = 60 ksi

D. Structural Steel

Structural Shapes (W, M, etc.) ..... ASTM A992, Fy = 50 ksi  
 Tubes ..... ASTM A500, Fy = 46 ksi  
 Miscellaneous ..... ASTM A36, Fy = 36 ksi  
 Pipe ..... ASTM A53, Fy = 35 ksi

E. Timber

Sawn Lumber..... Douglas Fir Larch  
 Glued Laminated Lumber..... Douglas Fir Larch

F. Soil

Based On Report By:

N/A

33.722733,-117.841008

from Internet

Conterminous 48 States  
 2009 International Building Code  
 Latitude = 33.722733  
 Longitude = -117.84100800000002  
 Spectral Response Accelerations Ss and S1  
 Ss and S1 = Mapped Spectral Acceleration Values  
 Site Class B -  $F_a = 1.0$ ,  $F_v = 1.0$   
 Data are based on a 0.01 deg grid spacing

Period	Sa
(sec)	(g)
0.2	1.453 (Ss, Site Class B)
1.0	0.513 (S1, Site Class B)

Conterminous 48 States  
 2009 International Building Code  
 Latitude = 33.722733  
 Longitude = -117.84100800000002  
 Spectral Response Accelerations SMs and SM1  
 $SMs = F_a \times Ss$  and  $SM1 = F_v \times S1$   
 Site Class D -  $F_a = 1.0$ ,  $F_v = 1.5$

Period	Sa
(sec)	(g)
0.2	1.453 (SMs, Site Class D)
1.0	0.770 (SM1, Site Class D)

Conterminous 48 States  
 2009 International Building Code  
 Latitude = 33.722733  
 Longitude = -117.84100800000002  
 Design Spectral Response Accelerations SDs and SD1  
 $SDs = 2/3 \times SMs$  and  $SD1 = 2/3 \times SM1$   
 Site Class D -  $F_a = 1.0$ ,  $F_v = 1.5$

Period	Sa
(sec)	(g)
0.2	0.968 (SDs, Site Class D)
1.0	0.513 (SD1, Site Class D)

JOB NAME: <b>1918 E Glenwood Place</b>	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L - 1</b>
	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>Lateral</b>		

## Seismic Design Criteria

Per IBC 2009

### Earthquake Loads per CBC 2010 & IBC 2009 Sections 1613 & ACSE 7-05 Sections 12-14

$E = \rho E_H + E_V$	$\rho = 1.00$	Redundancy Factor	ASCE 7 12.3.4
$E_M = \Omega_o \times E_H$	$\Omega_o = 2.00$	Overstrength Factor	ASCE 7 Table 12.2-1 (2.5 minus 0.5 for flex diaphragm per foot note "g") Shall not be less than 2.0
$E_V = 0.2 \times S_{DS} \times D$	$E_V = 0.19 D$	Vertical Component	ASCE 7 Section 12.4.2.2

### Seismic Base Shear per CBC 2010 & IBC 2009 Sections 1613-1622

		Description	Reference
	$S_s = 1.453$	Spectral acceleration short period	IBC Map 1613.5(1)
	$S_1 = 0.513$	Spectral acceleration 1 sec period	IBC Map 1613.5(2)
	Soil Site Class = D	Soil Profile Type	from Geotech report
	calc'ed $F_a = 1.00$	Site coefficient, Site Class D	IBC Table 1613.5.3(1)
	calc'ed $F_v = 1.50$	Site coefficient, Site Class D	IBC Table 1613.5.3(2)
	$S_{MS} = F_a S_s = 1.45$	Short period max spectral response	
	$S_{M1} = F_v S_1 = 0.77$	1 sec period max spectral response	
	$S_{DS} = 2/3 S_{MS} = 0.97$	Design short period max spectral response	IBC EQ. 16-39
	$S_{D1} = 2/3 S_{M1} = 0.51$	Design 1 sec period max spectral response	IBC EQ. 16-40
Bldg height	22 ft	Fundamental Period of shearwall	ASCE 7 EQ. 12.8-7
	$T = 0.20$ sec		
	$T_o = 0.2 S_{D1} / S_{DS} = 0.11$ sec		
	$T_s = S_{D1} / S_{DS} = 0.53$ sec		
	$S = 0.969$	Design spectral response acceleration	ASCE 7 Table 12.8-1
	Seismic Use Group = II	Group II, typical	ASCE 7 Table 1-1
	Seismic Design Category = D	ASCE 7 Tables 11.6-1 and 11.6-2	
	$I = 0.75$	Importance Factor	IEBC A206.1
	Plan Structural Irregularities = None	None	
	Vertical Structural Irregularities = None	None	
Intermediate Precast Concrete Bearing Wall	$R = 4.0$	Response Modification Coefficient	ASCE 7 Table 12.2-1
	$C_d = 4.0$	Deflection Amplification Factor	ASCE 7 Table 12.2-1
<b>Intermediate Precast Concrete Bearing Walls</b>			
	$C_s = S_{DS} I / R = 0.182 W$	Building Base Shear	ASCE 7 EQ. 12.8-2
	$C_{sMax} = S_{D1} I / (R T) = 0.47 W$	Maximum Base Shear	ASCE 7 EQ. 12.8-3
	$C_{sMin} = 0.5 S_1 I / R = 0.05 W$	Minimum Base Shear ( $S_1 > .6g$ )	ASCE 7 EQ. 12.8-6
	$F_t = 0.07 T V = 0.000 W$	Concentrated Top Force	ASCE 7 EQ. 12.14-13
	$V = 0.182 W + F_t$	<b>Governing Base Shear</b>	Allowable = <b>0.130 W</b>
		for flexible diaphragms	

### Seismic Diaphragm Shear per CBC 2007 & IBC 2006 Section 1620.1.5

From above	<b>0.182 W</b>	Based on Lateral System	<b>Governs</b>
Minimum $F_P = 0.2 S_{DS} I$	<b>0.145 W</b>	Minimum	
$F_P = 0.4 S_{DS} I$	<b>0.291 W</b>	Max Diaphragm Accel	
	<b>0.182 W</b>	Governing Diaphragm acceleration	Allowable = <b>0.130 W</b>

### Seismic Load to Structural Elements per CBC 2010 & IBC 2009 Section 1620.2 (Wall Anchorage)

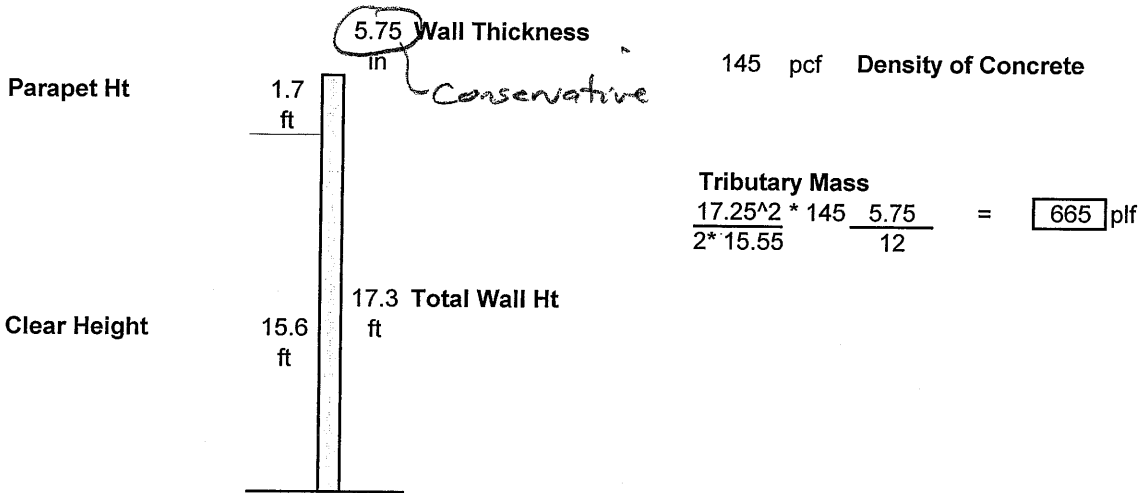
$F_P = 0.8 S_{DS} I$	<b>0.581 W</b>	Category C & Higher	Allowable = <b>0.415 W</b>
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\*Note - All seismic coefficients are ULTIMATE and must be divided by a factor of 1.4 for Allowable Stress Design.

JOB NAME: <b>1918 E Glenwood Place</b>	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 2</b>
	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>Lateral</b>		

## Tributary Mass for Wall Anchorage per Chapter A2 of IEBC

Purlins - Worst Case



### Wall Anchorage Force per 2010 CBC - Section 12.11 of ASCE 7-05

$F_p = 0.8 S_{ds} I W$   
 $I = 0.75$  linked per A206.1  
 $S_{ds} = 0.97$  linked  
 $F_p = 0.8 S_{ds} I W = 0.58 W = 386$  plf      Equation 12.11-1  
 $0.1 W = 66$  plf      Section 12.11.1  
 $400 S_{ds} I = 291$  plf      Section 12.11.2 b  
 $280$  plf      Section 12.11.2 c

Governs: 386 plf      Strength Level  
276 plf      Allowable Level

Steel Elements - use **Allowable Stress Design** and apply a Load Factor of 1.0      per Section A206.2  
**Steel Demand**       $276 \text{ plf} \times 1.0 = \text{276}$  plf

Concrete Elements - use **Strength Design** and apply a Load Factor of 1.0      per Section A206.2  
**Concrete Demand**       $386 \text{ plf} \times 1.0 = \text{386}$  plf

Wood Elements - use **Allowable Stress Design** with no additional Load Factors      per Section A206.2  
**Wood Demand**       $276 \text{ plf} \times 1.0 = \text{276}$  plf

	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 3</b>
JOB NAME: <b>1918 E Glenwood Place</b>	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>Lateral</b>		

## Purlin Wall Anchorage & Continuity Ties

### Purlins - Worst Case

Purlin Spacing:	8.0 ft				
Continuity Tie Spacing	24.0 ft				
Purlin Width	3.5 in				
Purlin Depth (Min)	13.25 in				
Purlin Span	24.0 ft				
		Loading per Purlin (based on spacing)			
		276	plf	2208	lbs Steel Demand
		386	plf	3091	lbs Concrete Demand
		276	plf	2208	lbs Wood Demand
					Wood Type DF #1 (assumed)
					per UBC 1982 (assumed)
					tension ft: 1200 psi
					flexural fb: 1400 psi

### Epoxy Check

**Demand** 3091 lbs 8.0 ft - max spacing of **concrete** demand  
 Capacity of Hilti HIT RE-500 SD based on PROFIS calculation for a **PAIR** of epoxy anchors  
 Assumes 5.50 inch thick wall with 4.00 inch embedment with 0.625 inch diameter rod and  
 8.0 inch spacing of anchors. Please see calc sheets  
**Capacity** 4150 lbs **OK**

### Zone 4 Hardware Check - Wall Anchor

**Demand** 2208 lbs 8.0 ft - max spacing of **steel** demand  
 Capacity of Zone 4 Hardware from City of LA RR# 25334 for a pair of hardware Please see Zone 4 Table  
 Assumes 3.50 inch thick member 13.25 inch deep member (min)  
 Hardware **T2 43-5 (Pair)** Hardware **T2 24-6 (Pair)**  
**Capacity** 5830 lbs **OK** Capacity 5071 lbs **OK**  
 ICC ICC

### Zone 4 Hardware Check - Continuity Tie

**Demand** 6623 lbs 24.0 ft - max spacing of **steel** demand  
 Capacity of Zone 4 Hardware from City of LA RR# 25334 for a pair of hardware Please see Zone 4 Table  
 Assumes 3.50 inch thick member 13.25 inch deep member (min)  
 Hardware **T2 44-6 (Pair)** Hardware  
**Capacity** ##### lbs **OK** Capacity lbs **OK**  
 ICC

### Subdiaphragm Check to Purlin Continuity Ties

**Demand** 4416 lbs 2 purlin bays of **wood** demand into subdiaphragm since next wall anchor is on CT line  
 Assumes 24.0 ft deep subdiaphragm  
 92 plf **Resulting Subdiaphragm Shear Demand**  
 System **1/2" CDX plywood with 8d @ 6" oc** assumed - worst case  
**Capacity** 270 lbs **OK**

### Check Purlin Continuity Tie for Combined Gravity and Axial Seismic

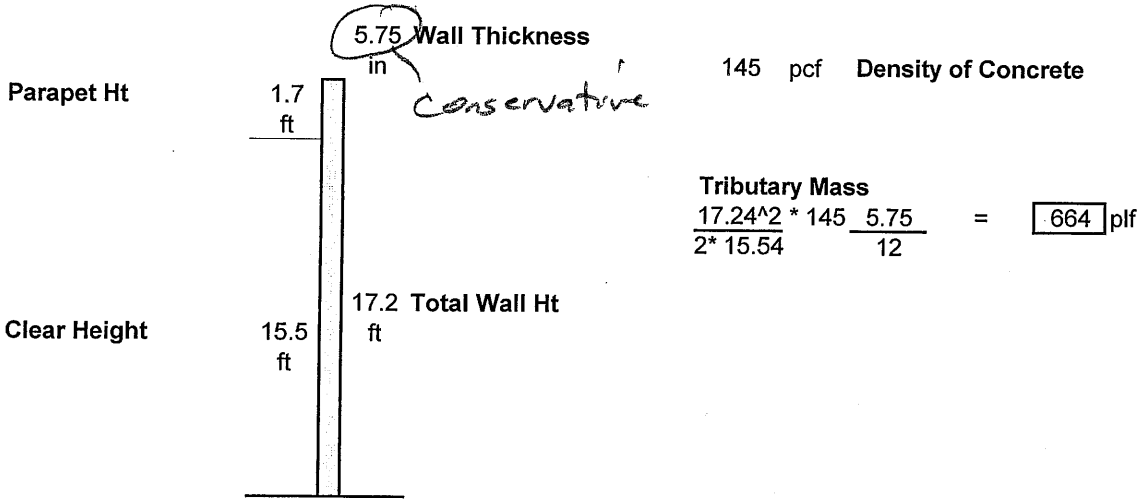
**Axial Wood Demand** 6623 lbs 24.0 ft - max spacing of **wood** demand  
 Resulting axial stress for 3.5 in. x 13.25 in. **142.8** psi  
 Assumed member DL **12.0** psf resulting in uniform loa **96** plf for a span **24.0** ft  
 For a max moment c **82944** lb-in on a section modulus **102.4** in<sup>3</sup>  
 Resulting flexural stress for 3.5 in. x 13.25 i **809.9** psi  
**Unity Check** axial bending  

$$\frac{143}{1200} + \frac{809.9}{1400} = 0.70 < 1.6$$
 **OK**

JOB NAME: <b>1918 E Glenwood Place</b>	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 4</b>
ANALYSIS: <b>Lateral</b>	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>

## Tributary Mass for Wall Anchorage per Chapter A2 of IEBC

Subpurlins - Worst Case



### Wall Anchorage Force per 2010 CBC - Section 12.11 of ASCE 7-05

$F_p = 0.8 S_d s I W$   
 $I = 0.75$  linked per A206.1  
 $S_d s = 0.97$  linked  
 $F_p = 0.8 S_d s I W = 0.58 W = 386 \text{ plf}$  Equation 12.11-1  
 $0.1 W = 66 \text{ plf}$  Section 12.11.1  
 $400 S_d s I = 291 \text{ plf}$  Section 12.11.2 b  
 $280$  Section 12.11.2 c

Governs: 386 plf **Strength Level**  
276 plf **Allowable Level**

Steel Elements - use **Allowable Stress Design** and apply a Load Factor of 1.0 per Section A206.2  
**Steel Demand**  $276 \text{ plf} \times 1.0 = \text{276 plf}$

Concrete Elements - use **Strength Design** and apply a Load Factor of 1.0 per Section A206.2  
**Concrete Demand**  $386 \text{ plf} \times 1.0 = \text{386 plf}$

Wood Elements - use **Allowable Stress Design** with no additional Load Factors per Section A206.2  
**Wood Demand**  $276 \text{ plf} \times 1.0 = \text{276 plf}$

	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 5</b>
JOB NAME: <b>1918 E Glenwood Place</b>	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>Lateral</b>		

## Subpurlin (Rod) Wall Anchorage & Continuity Ties

Subpurlins - Worst Case

Anchor Line Trib:	6.0 ft	Loading per Anchor Line (based on spacing)	
Purlin Width	1.5 in	276 plf	1655 lbs Steel Demand
Purlin Depth (Min)	3.5 in	386 plf	2317 lbs Concrete Demand
Wood Type	DF #1 (assumed)	276 plf	1655 lbs Wood Demand

### Epoxy Check

**Demand** 2317 lbs 6.0 ft - max trib of concrete demand  
Capacity of Hilti HIT RE-500 SD based on PROFIS calculation for a **SINGLE** epoxy anchor  
**Assumes** 5.50 inch thick wall with 4.00 inch embedment with 0.625 inch diameter rod and  
**Capacity** 2600 lbs OK Please see calc sheets

### Development of Anchorage Force into Subdiaphragm - assumes field nailing

**Demand** 1655 lbs 1 # of rods of wood demand adjacent to analyzed rafter line  
**Assumes** 16.0 ft deep subdiaphragm  
52 plf **Resulting Subdiaphragm Shear Demand** (note: load split between two rafter lines)  
**System** 1/2" CDX plywood with 8d @ 12" oc assumed - worst case - field nailing  
**Capacity** 135 lbs OK

### Subdiaphragm Check to GLB Continuity Ties

**Demand** 6620 lbs 4 # of rods of wood demand since the GLB wall anchors are not in subdiaphragm  
**Assumes** 16.0 ft deep subdiaphragm  
207 plf **Resulting Subdiaphragm Shear Demand**  
**System** 1/2" CDX plywood with 8d @ 6" oc assumed - worst case  
**Capacity** 270 lbs OK

### Zone 4 Hardware Check - Continuity Tie on GLBs

**Demand** 7172 lbs 26.0 ft - max spacing of steel demand  
Capacity of Zone 4 Hardware from City of LA RR# 25334 for a pair of hardware Please see Zone 4 Table  
**Assumes** 5.125 inch thick member 11.25 inch deep member (min)  
**Hardware** T2 44-6 (Pair) Hardware  
**Capacity** ##### lbs OK Capacity lbs OK  
ICC



Zone 4 - ICC report #5302

TABLE 2—CT CONTINUITY TIE AND T2 TENSION TIE/HOLD-DOWN TENSION DESIGN CAPACITIES FOR PAIRED CONNECTORS  
(Design Capacities are based upon Allowable Stress Design)

CT/T2 Paired Connection (PC) System						CT/T2 Paired Connection (PC) Design Capacities (pounds) (C <sub>D</sub> = 1.33) <sup>1,2,3,4,5,6,10,12</sup>													
PC Model	A307 Bolts Quantity & Diam. (inches)	Min. End Distance <sup>6</sup> (inches)	Anchor Rods <sup>7,11</sup> (C <sub>D</sub> = 1.33)		b <sup>8</sup> min. width (depth) (inches)	t (inches), length of bolt in wood member (thickness)													
			A36 (F <sub>u</sub> = 58,000 psi) Diam. (inches)	Capacity (pounds)		1.50	2.50	3.00	3.50	5.125	5.50	7.50							
(2) 24-5	(2) 3/8	2.5/8	(2) 5/8	15630	3.5	2065	2862												
(2) 43-5	(4) 3/8				3.5	4190	5630												
(2) 63-5	(8) 3/8				3.5	5270	8746												
					5.5	8284													
(2) 63-6	(8) 3/8				3.5	5270	8783	10639	11681										
					5.5	7550	11631	11831											
					7.25	8379													
(2) 24-6	(2) 1/2				3 1/2	(2) 3/4	22503	3.5	2783	4655	5071								
(2) 44-6	(4) 1/2							3.5	5055	8424	10109	10365							
								5.5	6668	9310	10365								
(2) 64-6	(8) 1/2	3.5	5055	8424				10109	11179	11497	15548								
		5.5	7383	12272				14726	15528	15548									
		7.25	8379	13835				15548											
(2) 84-6	(8) 1/2	3.5	5055	8424				10109	11179	11497	16082	20731							
		5.5	7353	12272				14726	17181	20731	20731								
		7.25	9226	15343				18411	20731										
		9.25	10962	18270				20731											
		11.25	11172	18620															
(2) 24-7	(2) 5/8	4 3/8	(2) 3/4	22503	5.5	3491	5319	6683	7823										
(2) 43-7	(4) 5/8				5.5	6633	11638	13665	16198										
					5.5	7177	11931	14353	16746	24294									
(2) 63-7	(8) 5/8				7.25	9034	15058	18087	21078										
					9.25	10474	17458	20948	24294										
					5.5	7177	11931	14353	16746	27903	28043	32392							
(2) 83-7	(8) 5/8				7.25 / 7.5	9034	15058	18087	21078										
					9.25	10604	18007	21609	25210										
					11.25	12117	20194	24233	28272										
					13.25	12970	21816	25939	30283										
(2) 24-8	(2) 3/4	5 1/4	(2) 3/4	22503	5.5	4190	6683	8379	9776	11409									
(2) 43-8	(4) 3/4				5.5	6660	11650	13681	16311	23322									
					7.25	8379	13665	16758	19531										
					5.5	6660	11650	13681	16311	23380	23228	34663	34663						
(2) 63-8	(8) 3/4				7.25 / 7.5	8662	14789	17729	20677										
					9.25	10547	17745	21284	24842										
					11.25	11973	18853	22848	27837										
					13.25	12569	20348	25137	29327										

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa

TABLE 2—CT CONTINUITY TIE AND T2 TENSION TIE/HOLD-DOWN TENSION DESIGN CAPACITIES FOR PAIRED CONNECTORS—(Continued)

CT/T2 Paired Connection (PC) System						CT/T2 Paired Connection (PC) Design Capacities (pounds) (C <sub>D</sub> = 1.33) <sup>1,2,3,4,5,6,10,12</sup>								
PC Model	A307 Bolts Quantity & Diam. (inches)	Min. End Distance <sup>6</sup> (inches)	Anchor Rods <sup>7,11</sup> (C <sub>D</sub> = 1.33)		b <sup>8</sup> min. width (depth) (inches)	t (inches), length of bolt in wood member (thickness)								
			A36 (F <sub>u</sub> = 58,000 psi) Diam. (inches)	Capacity (pounds)		1.50	2.50	3.00	3.50	5.125	5.50	7.50		
(2) 27-8	(2) 7/8	6 1/8	(2) 1	36968	5.5	4888	8146	9776	11405	15529				
(2) 47-8	(4) 7/8				5.5	8504	11340	13608	15876	25557	27634	31744		
					7.25 / 7.5	8689	14482	17379	20275	31744	31744			
(2) 67-8	(8) 7/8				9.25	9776	16283	19551	22810					
					5.5	5588	9310	11172	13034	19066	20282			
					5.5	6817	11029	13295	15441	24954	26780	35518		
(2) 48-9	(4) 1				7.25 / 7.5	8517	14186	17035	19874	34785	38850	41481		
					9.25/9.5	10831	17219	20683	24108	37870	40564			
					11.25	11172	18820	22344	26038	38171				
					5.5	6817	11029	13235	15441	24954	26760	35518		
(2) 68-10	(8) 1	7.25 / 7.5	8517	14186	17035	19874	34785	38850	52977					
		9.25/9.5	10831	17219	20683	24108	37870	41881	62182					
		11.25/11.5	11888	18477	23373	27268	46972	51539						
		13.25/13.5	12883	20971	25165	29059	54833	60183						
		>15.5												

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa

- Design capacities have been increased by a 1.33 load duration factor (C<sub>D</sub>) in accordance with Section 1612.3.3 of the UBC. Wood member design capacities include consideration of tensile stresses.
- Maximum bolt design capacities in the minimum size wood member are shown by ##.
- Maximum bolt design capacities are achieved in smaller size wood members in areas shown by c.
- Design capacities controlled by the net section tension capacity of the wood member are shown by ##.
- Maximum design capacities of wood members are achieved with connectors using fewer and/or smaller bolts or both in areas shown by ##.
- The minimum end distance, from the end of the wood member to the centerline of the first CT/T2 bolt, is seven (7) CT/T2 bolt diameters. End distance may be increased with no decrease in design capacities.
- The capacity of the concrete anchor must be equal to or greater than the design capacity of the connector being specified.
- b = width (depth) of the wood member.
- The design engineer shall check the wood member's design capacity for use conditions subject to additional loads (i.e. roof and floor dead loads). The applicable formulas and allowable stresses, per the 1991 NDS, should be used when calculating design capacities for wood members subject to a combination of bending about both axes and axial tension or compression.
- Table is based on wood type and grade, Douglas Fir-Larch, No. 2 type, No. 1 @ 5 x 5 and larger.
- For anchor rod design capacities of ASTM A183-B7, A364-BD and A449 the A36 (F<sub>u</sub> = 58.0 ksi) tension capacities shown in the tables should be multiplied by the following factors:

Anchor Rod (Diameter)	F <sub>u</sub> min (ksi)	Factor
ASTM A183-B7 (5/8 - 1 1/2)	125.0	2.155
ASTM A364-BD (5/8 - 1 1/2)	150.0	2.588
ASTM A449 (5/8 - 1)	120.0	2.069
ASTM A449 (1 1/8 - 1 1/2)	105.0	1.810

Design capacities are based upon allowable stress design.

JOB NAME: <b>1918 E Glenwood Place</b>	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L-7</b>
	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>General</b>		

## Wall Angle Brackets at Purlins and GLBS

### GLB Wall anchorage

FEMA & COLA require that the effects of the pilaster be considered.

Regular Trib = 4'

Trib w/ pilaster effect - assume double = 8'

↳ This would be 1/3 of panel Length (Conservative)

OK

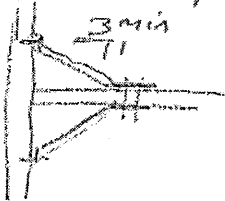
### Epoxy

based on previous calc, each anchor good for 4.0' of Trib  
we will be providing a pair of anchors (each side)  
so capacity is 8'

OK

### Hardware

due to panel joint & other obstructions, provide angle kickers



$$\text{Load } 8' \times 465 \text{ plf} = \frac{3720 \text{ lbs}}{2 \text{ braces}} = 1860 \text{ lbs/brace}$$

increase due to skew

$$\frac{3.16}{3} \quad 1860 \times \frac{\sqrt{1^2 + 3^2}}{3} = 1960 \text{ lbs}$$

L3x3x1/4 w/ 1960# tension/compression

per AISC 13<sup>th</sup> p.4-173 Table 4-11

capacity for 9' long  $6.33 \text{ k} < 1.96 \text{ k}$

OK

### Hardware bolts

$$\frac{1860 \text{ lbs}}{2 \text{ bolts}} = 930 \text{ lbs in } 5/8" \text{ GLB}$$

NDS p.90 Table 11I 5/8" stl, double shear,  $E_{11}$ , DF, 5/8"  $\phi$

capacity 2440#

$$\frac{3720 \text{ lbs}}{2440 \text{ lbs/bolt}} = 1.5 \Rightarrow \underline{2 \text{ bolts}}$$

(2) 5/8"  $\phi$  MB  
req'd



www.hilti.us

**PROFIS Anchor 2.1.4**

Company: National Engineering & Consulting  
 Specifier: MEO  
 Address:  
 Phone | Fax: - | -  
 E-Mail:

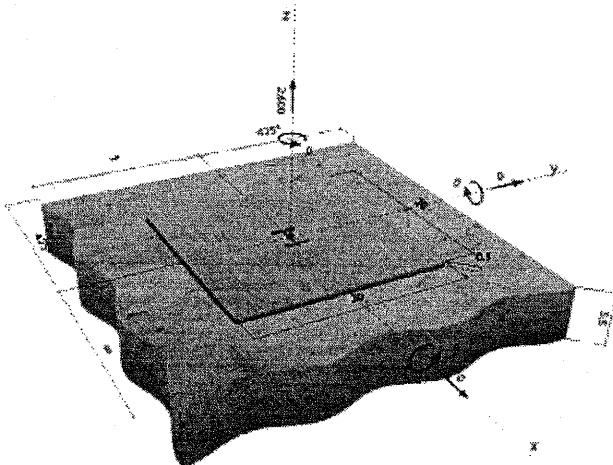
Page: 1  
 Project: 5.5" Thick Concrete  
 Sub-Project | Pos. No.:  
 Date: 7/6/2011

**Specifier's comments:**

**Input data**

Anchor type and diameter: HIT-RE 500-SD + HAS, 5/8  
 Effective embedment depth:  $h_{e,req} = 4.000$  in. ( $h_{e,prov} = 4.000$  in.)  
 Material: ASTM F 568M Class 5.8  
 Evaluation Service Report: ESR 2322  
 Issued | Valid: 4/1/2010 | -  
 Proof: design method ACI 318 / AC308  
 Stand-off installation:  $e_s = 0.000$  in. (no stand-off);  $t = 0.500$  in.  
 Anchor plate:  $l_p \times l_p \times t = 20.000 \times 20.000 \times 0.500$  in. (Recommended plate thickness: not calculated)  
 Profile: S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
 Base material: cracked concrete,  $2500$ ,  $f'_c = 2500$  psi;  $h = 5.500$  in., Temp. short/long: 70/70°F  
 Installation: hammer drilled hole, installation condition: dry  
 Reinforcement: tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: > No. 4 bar  
 Seismic loads (cat. C, D, E, or F): yes (D.3.3.5)

**Geometry [in.] & Loading [lb, in.-lb]**



**roof | Utilization (Governing Cases)**

Loading	Proof	Design values [lb]		Utilization [%]	Status
		Load	Capacity	$\beta_u / \beta_v$	
Tension	Bond Strength	2600	2601	100 / -	OK
Shear	-	-	-	- / -	-

**Warnings**

Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for agreement with the existing conditions and for plausibility!  
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**PROFIS Anchor 2.1.4**

Company: National Engineering & Consulting  
 Specifier: MEO  
 Address:  
 Phone / Fax: - / -  
 E-Mail:

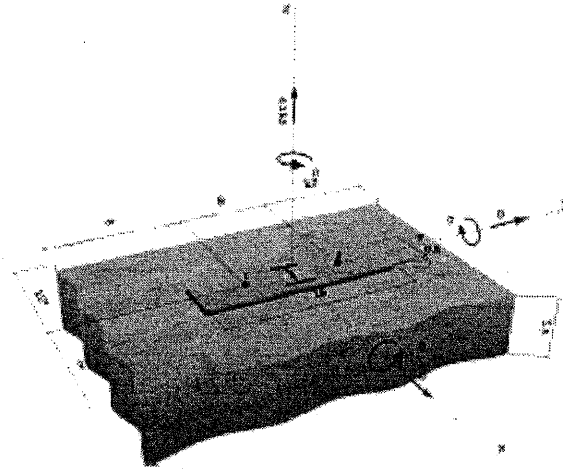
Page: 1  
 Project: 5.5" Thick Concrete  
 Sub-Project / Pos. No.:  
 Date: 7/8/2011

**Specifier's comments:**

**Input data**

**Anchor type and diameter:** HIT-RE 500-SD + HAS, 5/8  
**Effective embedment depth:**  $h_{ef,req} = 3.719$  in. ( $h_{ef,max} = 4.000$  in.)  
**Material:** ASTM F 568M Class 5.8  
**Evaluation Service Report:** ESR 2322  
**Issued / Valid:** 4/1/2010 | -  
**Proof:** design method ACI 318 / AC308  
**Stand-off installation:**  $e_a = 0.000$  in. (no stand-off);  $t = 0.500$  in.  
**Anchor plate:**  $l_p \times x \times t = 4.000 \times 16.000 \times 0.500$  in. (Recommended plate thickness: not calculated)  
**Profile:** S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
**Base material:** cracked concrete, 2500.  $f'_c = 2500$  psi;  $h = 5.500$  in., Temp. short/long: 70/70°F  
**Installation:** hammer drilled hole, installation condition: dry  
**Reinforcement:** tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: > No. 4 bar  
**Seismic loads (cat. C, D, E, or F):** yes (D.3.3.5)

**Geometry [in.] & Loading [lb. in. -lb]**



**Proof / Utilization (Governing Cases)**

Loading	Proof	Design values [lb]		Utilization [%]	Status
		Load	Capacity	$\beta_u/\beta_s$	
Tension	Bond Strength	4150	4152	100 / -	OK
Shear	-	-	-	- / -	-

**Warnings**

• Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

input data and results must be checked for agreement with the existing conditions and for plausibility!  
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PROFIS Anchor 2.1.4

Company: National Engineering & Consulting  
 Specifier: MEO  
 Address:  
 Phone / Fax: - / -  
 E-Mail:

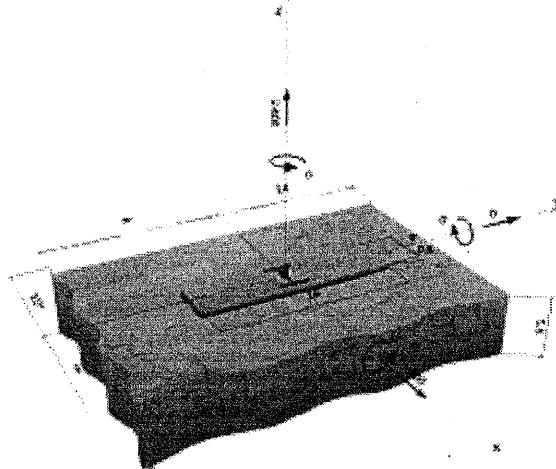
Page: 1  
 Project: 5.5" Thick Concrete  
 Sub-Project / Pos. No.:  
 Date: 7/6/2011

Specifier's comments:

## Input data

**Anchor type and diameter:** HIT-RE 500-SD + HAS, 5/8  
**Effective embedment depth:**  $h_{e,act} = 3.766$  in. ( $h_{e,max} = 4.000$  in.)  
**Material:** ASTM F 568M Class 5.8  
**Evaluation Service Report:** ESR 2322  
**Issued / Valid:** 4/1/2010 / -  
**Proof:** design method ACI 318 / AC308  
**Stand-off installation:**  $e_s = 0.000$  in. (no stand-off);  $t = 0.500$  in.  
**Anchor plate:**  $l_p \times l_p \times t = 4.000 \times 16.000 \times 0.500$  in. (Recommended plate thickness: not calculated)  
**Profile:** S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
**Base material:** cracked concrete, 2500.  $f'_c = 2500$  psi;  $h = 5.500$  in., Temp. short/long: 70/70°F  
**Installation:** hammer drilled hole, installation condition: dry  
**Reinforcement:** tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: > No. 4 bar  
**Seismic loads (cat. C, D, E, or F):** yes (D.3.3.5)

## Geometry [in.] &amp; Loading [lb, in.-lb]



## Proof / Utilization (Governing Cases)

Loading	Proof	Design values [lb]		Utilization [%]	Status
		Load	Capacity	$\beta_u/\beta_r$	
Tension	Bond Strength	2400	2448	98 / -	OK
Shear	Steel Strength (without lever arm)	900	4129	- / 22	OK
Loading	$\beta_u$	$\beta_r$	$\zeta$	Utilization $\beta_u/\beta_r$ [%]	Status
Combined tension and shear loads	0.950	0.218	-	100	OK

## Warnings

• Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for agreement with the existing conditions and for plausibility!  
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**CITY OF SANTA ANA  
PLAN CHECK - CHECKLIST**

JOB ADDRESS: Ritchey, St Andrew, Glenwood  
 TRACKING #: 10173635-37 DATE: 11-7-11

**FOR PLANCHECK STATUS CALL (714) 647-5800**

**PLEASE INITIAL EACH ITEM BELOW**

- 1. I agree to pay a plancheck fee established for this project with the understanding that this payment is not a guarantee that a permit will be issued and that this fee is not refundable once a plancheck has commenced.
- 2. I understand that I may request an "Accelerated Plancheck" at an additional cost to me. This plancheck will be performed by an in-house plan checker with the intention of reducing plancheck time for the Building & Safety Division.
- 3. I understand that the project valuation (from which plancheck and permit fees are calculated) will be reviewed during the plancheck process and that said valuation shall be adjusted up or down in accordance with established fee computation regulations.
- 4. I understand that I shall submit **separate plans, applications and plancheck fees** for the following when plan check is required:
  - a. Electrical Plans - 2 complete sets
  - b. Plumbing Plans - 3 complete sets
  - c. Mechanical Plans - 2 complete sets
  - d. Grading Plans - 3 complete sets
- 5. I understand that I shall visit the Public Works Department to verify whether a field inspection of the property is required. I understand that prior to the issuance of the Building permit I am required to obtain Public Works Agency approval if my project valuation exceeds \$30,000 or has added plumbing fixtures, or added bedrooms, or exceeds 500 sq.ft.

**AGREED TO BY APPLICANT OR AGENT**

Applicant's Signature: Michael Santillan  
 Print Name Michael Santillan Address 27 Orchard, Lake Forest  
 Telephone Number 714 803-8454 Fax 949-716-9997

**FOR OFFICE USE ONLY: "Checklist of items discussed" APPROVALS & FEES REQUIRED: Y/N**

- |  |   |  |
|--|---|--|
| 1. <input checked="" type="checkbox"/> Planning Department | 7. <del>NA</del> Title 24 (Energy)                            | 14. <input checked="" type="checkbox"/> Constr. Act. Req.    |
| 2. <input checked="" type="checkbox"/> Public Works Agency | 8. <del>NA</del> Title 24 (Disabled Access)                   | 15. <del>NA</del> Res. Dev. Fees                             |
| 3. <input checked="" type="checkbox"/> Fire Department     | 9. <del>NA</del> Roof Mounted Equip.                          | 16. <input checked="" type="checkbox"/> SMIP                 |
| 4. <del>NA</del> Police Department                         | 10. <input checked="" type="checkbox"/> List of Subcontr.     | 17. <del>NA</del> Microfilming                               |
| 5. <del>NA</del> School District                           | 11. <input checked="" type="checkbox"/> Bldg. Pmt. Info.      | 18. <input checked="" type="checkbox"/> Const. Debris Recyc. |
| 6. <del>NA</del> Health Department                         | 12. <input checked="" type="checkbox"/> Summary of Appr. Req. | 19. <del>NA</del> FCWP Surcharge                             |
|  | 13. <input checked="" type="checkbox"/> FY Information        | 20. <del>NA</del> LOA/Owner-Builder Ver.                     |

PERMIT TECHNICIAN Kellernander



Planning & Building Agency  
 Building Safety Division  
 20 Civic Center Plaza  
 P.O. Box 1988 (M-19)  
 Santa Ana, CA 92702  
 (714) 647-5800  
 www.santa-ana.org

## TENANT IMPROVEMENT PLAN CHECK COMMENTS

<b>PLAN CHECK NO:</b>	10173635,6,7		
<b>PROJECT ADDRESS:</b>	1831 S Ritchey St, 1917 E St. Andrews AND 1918 E Glenwood Pl.		
<b>PLAN CHECK ENGINEER:</b>	Kwak, Jason	<b>TEL: 714</b>	647-5866
		<b>FAX: 714</b>	647-5897
<b>TYPE OF CONSTRUCTION:</b>	V B		
<b>OCCUPANCY CLASSIFICATION(S):</b>	B, S-1		
<b>PLAN CHECK DATES:</b>		<b>REMARKS/RECHECK ITEMS:</b>	
<b>APPLICATION</b>	11/7/2011	_____	
<b>INITIAL REVIEW</b>	11/23/2011	_____	
<b>EXPIRATION</b>	5/5/2012	_____	
<b>RECHECKS:</b>	1.	<b>PROJECT APPLICANT CONTACT PERSON:</b>	
	2.	Michael Santillan	
	3.	<b>TEL:</b>	(949)716-9990
<b>VALUATION:</b>	\$30,000.00	<b>FAX:</b>	_____
<b>FLOOD ZONE:</b>	X-0602320277J	<b>EMAIL:</b>	michael.santillan@nationaleng.com

**APPLICABLE CODE: 2010 CALIFORNIA BUILDING CODE (CBC) WITH  
 CITY OF SANTA ANA AMENDMENTS**

1. All items noted on this plan check report must be addressed. If you feel that an item is not applicable to your project, note "N/A" and discuss the reason with the plan checker.
2. Please indicate the sheet number and detail to the right of each correction, or note the number on the plans where the correction is made. Resubmit marked original, calculations and this correction sheet. A separate sheet for response may be used.
3. Resubmit 3 corrected sets of plans.
4. Meetings between the project applicant/designer and the plan reviewer shall be by appointment only. Please call (714) 647-5866 for an appointment.

5. The drawings/information submitted for Building Safety Division review is incomplete. The applicant shall, prior to resubmitting, complete all construction documents to show compliance with the 2010 California Building Standards Code with local amendments. – Provide required disabled accessible upgrade proposal with plans.
6. This review does not include mechanical, plumbing, fire sprinkler system, or electrical work. Separate plans, applications, fees, plan checks, and permits are required for mechanical, plumbing, fire sprinkler systems, and electrical work. Call 647-5800 for information. – If applicable.
7. **The applicant shall obtain clearances/approvals for the following prior to building permit issuance:**
  - Planning Division approval on the corrected/final set of drawings (647-5804.) Previously approved plans should be submitted to expedite the process.
  - Fire Department approval on the corrected/final sets of drawings (647-5839 or 647-5700)
  - Proof of Worker's Compensation Insurance shall be required at the time of permit issuance
8. **Show on the plans:**
  - Occupancy Classification(s)
  - Type of Construction
  - Fire Sprinkler System
9. It is the project designer's/property owner's responsibility to show compliance on the drawings with all applicable Federal and State Accessibility Standards.
10. **Drawings submitted to the Building Division for review shall provide the following information to insure compliance with CBC Section 1134B/Chapter 11B:**
  - An accessible entrance
  - An accessible route to the altered area
  - Accessible restrooms
  - Accessible telephone (if any)
  - Accessible drinking fountains, and
  - Parking, signage and alarms
11. Priority shall be given to those elements that will provide the greatest access in the above order.
12. Valuation of proposed project is calculated as \$\_\_\_\_\_. A minimum of 20% of valuation of construction is required to be spent towards providing disabled access in the priority order noted in the immediate previous item as noted in CBC Section 1134B. Revise the drawings to show compliance. Show both existing elements and how they will be upgraded to current standards.
13. Provide completed disabled accessible compliance form (attached) with each project.
14. Provide ICC or LA RR listing number on plans for Zone 4 hardware.





**Structural Calculations**  
**Roof Seismic Strengthening - Partial**  
**Concrete Tilt-up Building**  
**1918 E Glenwood Place (Bldg D)**  
**Santa Ana, CA**

R-Voit-01D

**RECEIVED**

NOV 07 2011

City of Santa Ana



**Revision**

**0**

**October 11, 2011**

27 Orchard, Suite 200  
Lake Forest, CA 92630  
Phone: (949) 716-9990 Fax: (949) 716-9997  
[www.national-eng.com](http://www.national-eng.com)

The structural calculations contained in this report relate only to the structure and site for which they were prepared. Referenced building codes, site-specific parameters for wind and seismic design, and any cited material/component design standards are current only for the governmental agency with jurisdiction over the design and construction of the proposed structure at the time the report was published. Some information utilized in the structural calculations may have been received from outside sources such as third party site development coordinators, geotechnical engineering reports, pre-engineered component manufacturers, or engineering/trade organizations. NEC is not responsible for the accuracy and/or changes to any information utilized herein as provided by outside sources.

## Scope

THE PROJECT CONSISTS OF A LIMITED SEISMIC STRENGTHENING OF AN EXISTING INDUSTRIAL BUILDING. THE SCOPE OF THE PROJECT IS LIMITED TO THE REQUIREMENTS OF CHAPTER A2 OF THE INTERNATIONAL EXISTING BUILDING CODE AT THE ROOF LEVEL ONLY INCLUDING WALL ANCHORAGE, CONTINUITY TIES, AND DRAGS.

THERE IS NO MEZZANINE

THE BUILDING CONSISTS OF A CONCRETE TILT-UP BUILDING WITH A PANELIZED ROOF CONSISTING OF A PLYWOOD DIAPHRAGM SUPPORTED ON 2X RAFTERS SUPPORTED ON 4X PURLINS THAT SPAN TO GLULAM BEAMS. ORIGINAL BUILDING AGE AND BUILDING CODE WAS NOT DETERMINED BUT IS REPORTED TO PRE-DATE THE MID-1970'S.

THERE IS CURRENTLY NO KNOWN JURISDICTIONAL MANDATE FOR SEISMIC STRENGTHENING FOR THIS BUILDING.

STORY DRIFT, DIAPHRAGM STRENGTH, WALL STRENGTHS, ETC. ARE OUT OF SCOPE AND NOT ADDRESSED.

**3404.5 Voluntary seismic improvements.** Alterations to existing structural elements or additions of new structural elements that are not otherwise required by this chapter and are initiated for the purpose of improving the performance of the seismic force-resisting system of an *existing structure* or the performance of seismic bracing or anchorage of existing nonstructural elements shall be permitted, provided that an engineering analysis is submitted demonstrating the following:

1. The altered structure and the altered nonstructural elements are no less in compliance with the provisions of this code with respect to earthquake design than they were prior to the *alteration*.
2. New structural elements are detailed and connected to the existing structural elements as required by Chapter 16.
3. New or relocated nonstructural elements are detailed and connected to existing or new structural elements as required by Chapter 16.
4. The alterations do not create a structural irregularity as defined in ASCE 7 or make an existing structural irregularity more severe.

	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>G - 2</b>
JOB NAME: <b>1918 E Glenwood Place</b>	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>General</b>		

## Design Criteria

**I. Code**

A. Chapter A2 of the 2009 International Existing Building Code

**II. Lateral Loads**

Wind - Not Applicable

**III. Allowable Stresses for New Materials**

A. Structural Masonry

Walls..... Not Applicable

B. Concrete

(E) Wall panels & Columns ..... f 'c = 2,500 psi at 28 Days Assumed

(E) Slab on grade..... f 'c = 2,000 psi at 28 Days Assumed

C. Reinforcing Steel

Slabs & Footings ..... ASTM A615, Fy = 60 ksi

Welded Bars ..... ASTM A706, Fy = 60 ksi

D. Structural Steel

Structural Shapes (W, M, etc.) ..... ASTM A992, Fy = 50 ksi

Tubes ..... ASTM A500, Fy = 46 ksi

Miscellaneous ..... ASTM A36, Fy = 36 ksi

Pipe ..... ASTM A53, Fy = 35 ksi

E. Timber

Sawn Lumber..... Douglas Fir Larch

Glued Laminated Lumber..... Douglas Fir Larch

F. Soil

Based On Report By:

N/A

33.722733,-117.841008

from Internet

Conterminous 48 States  
 2009 International Building Code  
 Latitude = 33.722733  
 Longitude = -117.84100800000002  
 Spectral Response Accelerations Ss and S1  
 Ss and S1 = Mapped Spectral Acceleration Values  
 Site Class B - Fa = 1.0 ,Fv = 1.0  
 Data are based on a 0.01 deg grid spacing

Period	Sa
(sec)	(g)
0.2	1.453 (Ss, Site Class B)
1.0	0.513 (S1, Site Class B)

Conterminous 48 States  
 2009 International Building Code  
 Latitude = 33.722733  
 Longitude = -117.84100800000002  
 Spectral Response Accelerations SMs and SM1  
 SMs = Fa x Ss and SM1 = Fv x S1  
 Site Class D - Fa = 1.0 ,Fv = 1.5

Period	Sa
(sec)	(g)
0.2	1.453 (SMs, Site Class D)
1.0	0.770 (SM1, Site Class D)

Conterminous 48 States  
 2009 International Building Code  
 Latitude = 33.722733  
 Longitude = -117.84100800000002  
 Design Spectral Response Accelerations SDs and SD1  
 SDs = 2/3 x SMs and SD1 = 2/3 x SM1  
 Site Class D - Fa = 1.0 ,Fv = 1.5

Period	Sa
(sec)	(g)
0.2	0.968 (SDs, Site Class D)
1.0	0.513 (SD1, Site Class D)

JOB NAME: 1918 E Glenwood Place	JOB NO: R-Voit-01D	SHEET NO: L - 1
	ENGINEER: MEO'	DATE: Oct '11
ANALYSIS: Lateral		

## Seismic Design Criteria

Per IBC 2009

### Earthquake Loads per CBC 2010 & IBC 2009 Sections 1613 & ACSE 7-05 Sections 12-14

$E = \rho E_H + E_V$	$\rho = 1.00$	Redundancy Factor	ASCE 7 12.3.4
$E_M = \Omega_o \times E_H$	$\Omega_o = 2.00$	Overstrength Factor	ASCE 7 Table 12.2-1 (2.5 minus 0.5 for flex diaphragm per foot note "g") Shall not be less than 2.0
$E_V = 0.2 \times S_{DS} \times D$	$E_V = 0.19 D$	Vertical Component	ASCE 7 Section 12.4.2.2

### Seismic Base Shear per CBC 2010 & IBC 2009 Sections 1613-1622

		Description	Reference
	$S_s = 1.453$	Spectral acceleration short period	IBC Map 1613.5(1)
	$S_1 = 0.513$	Spectral acceleration 1 sec period	IBC Map 1613.5(2)
	Soil Site Class = D	Soil Profile Type	from Geotech report
	calc'ed $F_a = 1.00$	Site coefficient, Site Class D	IBC Table 1613.5.3(1)
	calc'ed $F_v = 1.50$	Site coefficient, Site Class D	IBC Table 1613.5.3(2)
	$S_{MS} = F_a S_s = 1.45$	Short period max spectral response	
	$S_{M1} = F_v S_1 = 0.77$	1 sec period max spectral response	
	$S_{DS} = 2/3 S_{MS} = 0.97$	Design short period max spectral response	IBC EQ. 16-39
	$S_{D1} = 2/3 S_{M1} = 0.51$	Design 1 sec period max spectral response	IBC EQ. 16-40
Bldg height	22 ft	$T = 0.20$ sec	Fundamental Period of shearwall
		$T_o = 0.2 S_{D1} / S_{DS} = 0.11$ sec	
		$T_s = S_{D1} / S_{DS} = 0.53$ sec	
		$S = 0.969$	Design spectral response acceleration
	Seismic Use Group = II	Group II, typical	ASCE 7 Table 1-1
	Seismic Design Category = D	ASCE 7 TableS 11.6-1 and 11.6-2	
	$I = 0.75$	Importance Factor	IEBC A206.1
	Plan Structural Irregularities = None	None	
	Vertical Structural Irregularities = None	None	
Intermediate Precast Concrete Bearing Wall	$R = 4.0$	Response Modification Coefficient	ASCE 7 Table 12.2-1
	$C_d = 4.0$	Deflection Amplification Factor	ASCE 7 Table 12.2-1
<b>Intermediate Precast Concrete Bearing Walls</b>			
	$C_s = S_{DS} I / R = 0.182 W$	Building Base Shear	ASCE 7 EQ. 12.8-2
	$C_s \text{Max} = S_{D1} I / (R T) = 0.47 W$	Maximum Base Shear	ASCE 7 EQ. 12.8-3
	$C_s \text{Min} = 0.5 S_1 I / R = 0.05 W$	Minimum Base Shear ( $S_1 > .6g$ )	ASCE 7 EQ. 12.8-6
	$F_t = 0.07 T V = 0.000 W$	Concentrated Top Force	ASCE 7 EQ. 12.14-13
	<b>V = 0.182 W + Ft</b>	<b>Governing Base Shear</b>	Allowable = <b>0.130 W</b>
		for flexible diaphragms	

### Seismic Diaphragm Shear per CBC 2007 & IBC 2006 Section 1620.1.5

From above	<b>0.182 W</b>	Based on Lateral System	<b>Governs</b>
Minimum $F_P = 0.2 S_{DS} I$	<b>0.145 W</b>	Minimum	
$F_P = 0.4 S_{DS} I$	<b>0.291 W</b>	Max Diaphragm Accel	
	<b>0.182 W</b>	Governing Diaphragm acceleration	Allowable = <b>0.130 W</b>

### Seismic Load to Structural Elements per CBC 2010 & IBC 2009 Section 1620.2 (Wall Anchorage)

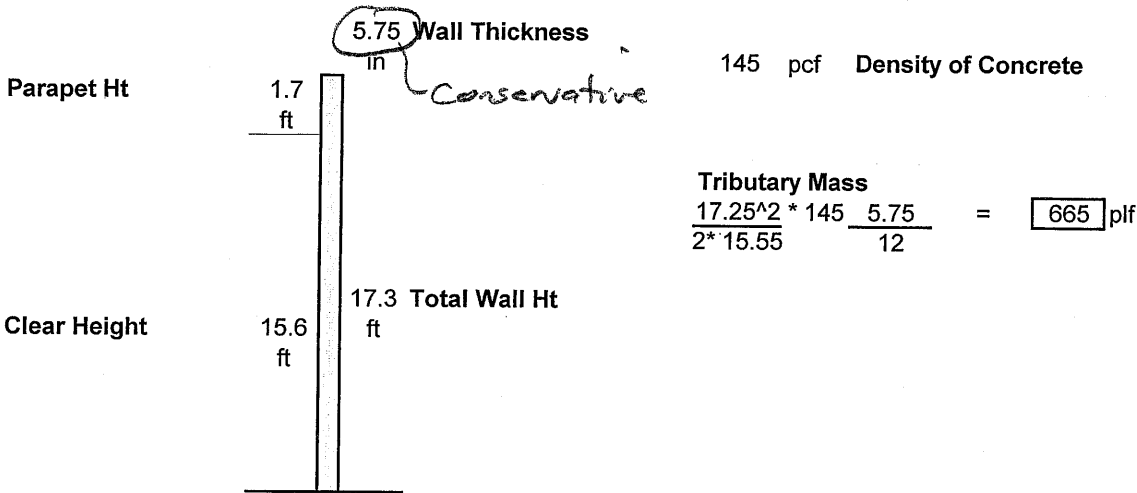
$F_P = 0.8 S_{DS} I$	<b>0.581 W</b>	Category C & Higher	Allowable = <b>0.415 W</b>
----------------------	----------------	---------------------	----------------------------

\*Note - All seismic coefficients are ULTIMATE and must be divided by a factor of 1.4 for Allowable Stress Design.

JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 2</b>
JOB NAME: <b>1918 E Glenwood Place</b>	ENGINEER: <b>MEO'</b>
ANALYSIS: <b>Lateral</b>	DATE: <b>Oct '11</b>

## Tributary Mass for Wall Anchorage per Chapter A2 of IEBC

Purlins - Worst Case



### Wall Anchorage Force per 2010 CBC - Section 12.11 of ASCE 7-05

$F_p = 0.8 S_{ds} I W$   
 $I = 0.75$  linked per A206.1  
 $S_{ds} = 0.97$  linked  
 $F_p = 0.8 S_{ds} I W = 0.58 W = 386$  plf      Equation 12.11-1  
 $0.1 W = 66$  plf      Section 12.11.1  
 $400 S_{ds} I = 291$  plf      Section 12.11.2 b  
 $280$       280 plf      Section 12.11.2 c

Governs: 386 plf      Strength Level  
276 plf      Allowable Level

Steel Elements - use **Allowable Stress Design** and apply a Load Factor of 1.0      per Section A206.2  
 Steel Demand       $276 \text{ plf} \times 1.0 = \text{276}$  plf

Concrete Elements - use **Strength Design** and apply a Load Factor of 1.0      per Section A206.2  
 Concrete Demand       $386 \text{ plf} \times 1.0 = \text{386}$  plf

Wood Elements - use **Allowable Stress Design** with no additional Load Factors      per Section A206.2  
 Wood Demand       $276 \text{ plf} \times 1.0 = \text{276}$  plf

JOB NO:	R-Voit-01D	SHEET NO:	L- 3
JOB NAME:	1918 E Glenwood Place	ENGINEER:	MEO'
ANALYSIS:	Lateral	DATE:	Oct '11

## Purlin Wall Anchorage & Continuity Ties

### Purlins - Worst Case

Purlin Spacing: 8.0 ft  
 Continuity Tie Spacing 24.0 ft  
 Purlin Width 3.5 in  
 Purlin Depth (Min) 13.25 in  
 Purlin Span 24.0 ft

Loading per Purlin (based on spacing)	
276 plf	2208 lbs Steel Demand
386 plf	3091 lbs Concrete Demand
276 plf	2208 lbs Wood Demand

Wood Type DF #1 (assumed)  
 per UBC 1982 (assumed)  
 tension ft: 1200 psi  
 flexural fb: 1400 psi

### Epoxy Check

**Demand** 3091 lbs 8.0 ft - max spacing of **concrete** demand  
 Capacity of Hilti HIT RE-500 SD based on PROFIS calculation for a **PAIR** of epoxy anchors  
 Assumes 5.50 inch thick wall with 4.00 inch embedment with 0.625 inch diameter rod and  
 8.0 inch spacing of anchors. Please see calc sheets  
**Capacity** 4150 lbs **OK**

### Zone 4 Hardware Check - Wall Anchor

**Demand** 2208 lbs 8.0 ft - max spacing of **steel** demand  
 Capacity of Zone 4 Hardware from City of LA RR# 25334 for a pair of hardware Please see Zone 4 Table  
 Assumes 3.50 inch thick member 13.25 inch deep member (min)  
 Hardware **T2 43-5 (Pair)** Hardware **T2 24-6 (Pair)**  
**Capacity** 5830 lbs **OK** Capacity 5071 lbs **OK**  
 ICC ICC

### Zone 4 Hardware Check - Continuity Tie

**Demand** 6623 lbs 24.0 ft - max spacing of **steel** demand  
 Capacity of Zone 4 Hardware from City of LA RR# 25334 for a pair of hardware Please see Zone 4 Table  
 Assumes 3.50 inch thick member 13.25 inch deep member (min)  
 Hardware **T2 44-6 (Pair)** Hardware  
**Capacity** ##### lbs **OK** Capacity lbs **OK**  
 ICC

### Subdiaphragm Check to Purlin Continuity Ties

**Demand** 4416 lbs 2 purlin bays of **wood** demand into subdiaphragm since next wall anchor is on CT line  
 Assumes 24.0 ft deep subdiaphragm  
 92 plf **Resulting Subdiaphragm Shear Demand**  
 System 1/2" CDX plywood with 8d @ 6" oc assumed - worst case  
**Capacity** 270 lbs **OK**

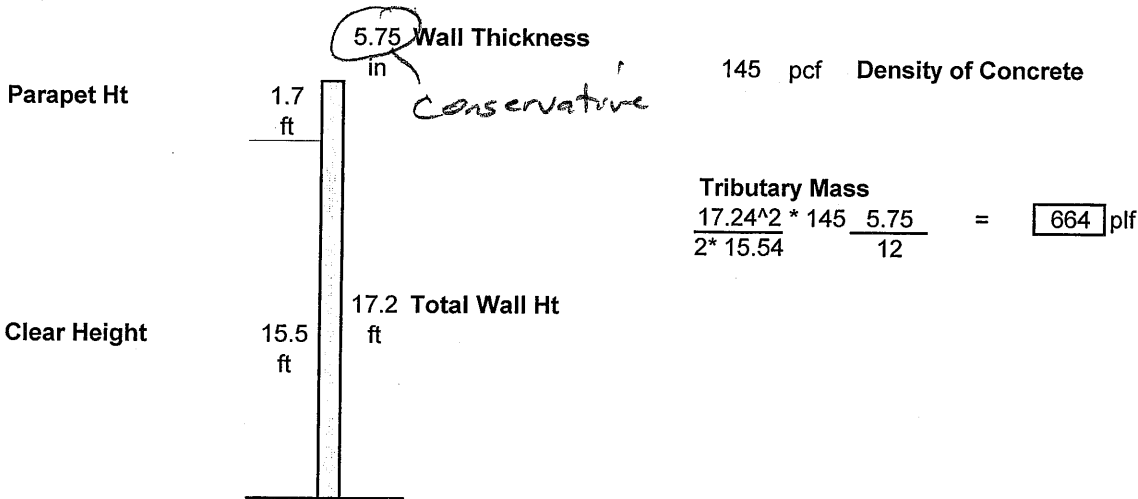
### Check Purlin Continuity Tie for Combined Gravity and Axial Seismic

**Axial Wood Demand** 6623 lbs 24.0 ft - max spacing of **wood** demand  
 Resulting axial stress for 3.5 in. x 13.25 in. 142.8 psi  
 Assumed member DL 12.0 psf resulting in uniform loa 96 plf for a span 24.0 ft  
 For a max moment c 82944 lb-in on a section modulus 102.4 in<sup>3</sup>  
 Resulting flexural stress for 3.5 in. x 13.25 i 809.9 psi  
**Unity Check** axial bending  
 $\frac{143}{1200} + \frac{809.9}{1400} = 0.70 < 1.6$  **OK**

JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 4</b>
JOB NAME: <b>1918 E Glenwood Place</b>	ENGINEER: <b>MEO'</b>
ANALYSIS: <b>Lateral</b>	DATE: <b>Oct '11</b>

## Tributary Mass for Wall Anchorage per Chapter A2 of IEBC

### Subpurlins - Worst Case



#### Wall Anchorage Force per 2010 CBC - Section 12.11 of ASCE 7-05

$F_p = 0.8 S_d s I W$   
 $I = 0.75$  linked per A206.1  
 $S_d s = 0.97$  linked  
 $F_p = 0.8 S_d s I W = 0.58 W = 386$  plf      Equation 12.11-1  
 $0.1 W = 66$  plf      Section 12.11.1  
 $400 S_d s I = 291$  plf      Section 12.11.2 b  
 $280$       280 plf      Section 12.11.2 c

Governs: 386 plf      Strength Level  
276 plf      Allowable Level

Steel Elements - use **Allowable Stress Design** and apply a Load Factor of 1.0      per Section A206.2  
**Steel Demand**       $276 \text{ plf} \times 1.0 = \text{276}$  plf

Concrete Elements - use **Strength Design** and apply a Load Factor of 1.0      per Section A206.2  
**Concrete Demand**       $386 \text{ plf} \times 1.0 = \text{386}$  plf

Wood Elements - use **Allowable Stress Design** with no additional Load Factors      per Section A206.2  
**Wood Demand**       $276 \text{ plf} \times 1.0 = \text{276}$  plf



	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L- 5</b>
JOB NAME: <b>1918 E Glenwood Place</b>	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>Lateral</b>		

## Subpurlin (Rod) Wall Anchorage & Continuity Ties

Subpurlins - Worst Case

Anchor Line Trib:	6.0 ft				
Purlin Width	1.5 in				
Purlin Depth (Min)	3.5 in				
Wood Type	DF #1 (assumed)				
				Loading per Anchor Line (based on spacing)	
		276 plf	1655 lbs	Steel Demand	
		386 plf	2317 lbs	Concrete Demand	
		276 plf	1655 lbs	Wood Demand	

### Epoxy Check

**Demand** 2317 lbs      6.0 ft - max trib of *concrete* demand  
Capacity of Hilti HIT RE-500 SD based on PROFIS calculation for a **SINGLE** epoxy anchor  
**Assumes** 5.50 inch thick wall with 4.00 inch embedment with 0.625 inch diameter rod and  
**Capacity** 2600 lbs      OK      Please see calc sheets

### Development of Anchorage Force into Subdiaphragm - assumes field nailing

**Demand** 1655 lbs      1 # of rods of *wood* demand adjacent to analyzed rafter line  
**Assumes** 16.0 ft deep subdiaphragm  
52 plf      **Resulting Subdiaphragm Shear Demand** (note: load split between two rafter lines)  
**System** 1/2" CDX plywood with 8d @ 12" oc      assumed - worst case - **field nailing**  
**Capacity** 135 lbs      OK

### Subdiaphragm Check to GLB Continuity Ties

**Demand** 6620 lbs      4 # of rods of *wood* demand since the GLB wall anchors are not in subdiaphragm  
**Assumes** 16.0 ft deep subdiaphragm  
207 plf      **Resulting Subdiaphragm Shear Demand**  
**System** 1/2" CDX plywood with 8d @ 6" oc      assumed - worst case  
**Capacity** 270 lbs      OK

### Zone 4 Hardware Check - Continuity Tie on GLBs

**Demand** 7172 lbs      26.0 ft - max spacing of *steel* demand  
Capacity of Zone 4 Hardware from City of LA RR# 25334 for a pair of hardware      Please see Zone 4 Table  
**Assumes** 5.125 inch thick member      11.25 inch deep member (min)  
**Hardware** T2 44-6 (Pair)      Hardware  
**Capacity** ##### lbs      OK      Capacity      lbs      OK  
ICC

Zone 4 - ICC report #5302

TABLE 2—CT CONTINUITY TIE AND T2 TENSION TIE/HOLD-DOWN TENSION DESIGN CAPACITIES FOR PAIRED CONNECTORS  
(Design Capacities are based upon Allowable Stress Design)

CT/T2 Paired Connection (PC) System						CT/T2 Paired Connection (PC) Design Capacities (pounds) (C <sub>D</sub> = 1.33) <sup>1,2,3,4,5,6,10,12</sup>											
PC Model	A307 Bolts Quantity & Diam. (inches)	Min. End Distance <sup>a</sup> (inches)	Anchor Rods <sup>4,11</sup> (C <sub>D</sub> = 1.33)		b <sup>5</sup> min. width (depth) (inches)	t (inches), length of bolt in wood member (thickness)											
			A36 (F <sub>u</sub> = 58,000 psi) Diam. (inches)	Capacity (pounds)		1.50	2.50	3.00	3.50	5.125	5.50	7.50					
(2) 24-5	(2) 3/8	2.5/8	(2) 5/8	15630	3.5	2065	2862										
(2) 43-5	(4) 3/8				3.5	4190	5830										
(2) 63-5	(8) 3/8				3.5	8270	8746										
					5.5	9284											
					3.5	6270	8783	11063	11681								
					5.5	7550	11691	11831									
					7.25	8379											
					3.5	2783	4655	5071									
					3.5	5065	8424	10109	10385								
					5.5	6688	9310	10385									
(2) 24-6	(2) 1/2	3 1/2	(2) 3/4	22503	3.5	8065	8424	10109	11794	14967	15548						
(2) 44-6	(4) 1/2				3.5	7983	12272	14728	15528	15548							
(2) 64-6	(8) 1/2				3.5	8379	13655	15548									
					5.5	8055	8424	10109	11794	14967	16052	20731					
					5.5	7353	12272	14728	17181	20731	20731						
					7.25	8206	15343	18411	20731								
					9.25	11062	18270	20731									
					11.25	11172	18620										
					5.5	3491	5319	6683	7823								
					5.5	6633	11638	13665	16198								
		5.5	7177	11981	14353	16746	24294										
		7.25	9034	15058	18087	21078											
		9.25	10474	17458	20949	24294											
		5.5	7177	11981	14353	16746	27003	28043	32362								
		7.25 / 7.5	8034	15058	18087	21078	32362	32362									
		9.25	11064	18007	21609	25210											
		11.25	12117	20184	24233	28272											
		13.25	12970	21818	25838	30283											
		5.5	4190	6683	8379	9776	11409										
		5.5	6660	11650	13681	16311	23322										
		7.25	8379	13665	16758	19531											
		5.5	6660	11650	13681	16311	28380	28286	34983	34983							
		7.25 / 7.5	8862	14788	17729	20677											
		9.25	11047	17745	21284	24842											
		11.25	11973	18853	22848	27837											
		13.25	12569	20348	25137	29327											

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa

TABLE 2—CT CONTINUITY TIE AND T2 TENSION TIE/HOLD-DOWN TENSION DESIGN CAPACITIES FOR PAIRED CONNECTORS—(Continued)

CT/T2 Paired Connection (PC) System						CT/T2 Paired Connection (PC) Design Capacities (pounds) (C <sub>D</sub> = 1.33) <sup>1,2,3,4,5,6,10,12</sup>									
PC Model	A307 Bolts Quantity & Diam. (inches)	Min. End Distance <sup>a</sup> (inches)	Anchor Rods <sup>4,11</sup> (C <sub>D</sub> = 1.33)		b <sup>5</sup> min. width (depth) (inches)	t (inches), length of bolt in wood member (thickness)									
			A36 (F <sub>u</sub> = 58,000 psi) Diam. (inches)	Capacity (pounds)		1.50	2.50	3.00	3.50	5.125	5.50	7.50			
(2) 27-8	(2) 7/8	6 1/8	(2) 1	39968	5.5	4888	8148	9776	11405	15529					
(2) 47-8	(4) 7/8				5.5	8904	11340	13608	15878	25557	27834	31744			
					7.25 / 7.5	8688	14482	17379	20275	31744	31744				
					9.25	9776	16283	19551	22810						
					5.5	5588	9310	11172	13034	19098	20282				
					5.5	6817	11029	13295	15441	24954	26780	36518			
					7.25 / 7.5	8517	14186	17035	19874	34785	38850	41481			
					9.25/9.5	10331	17219	20663	24108	37870	40564				
					11.25	11172	18820	22344	28038	38171					
					5.5	6817	11029	13295	15441	24954	26780	36518			
		7.25 / 7.5	8517	14186	17035	19874	34785	38850	41481						
		9.25/9.5	10331	17219	20663	24108	37870	41881	62182						
		11.25/11.5	11888	18477	23373	27288	48972	51539							
		13.25/13.5	12883	20971	25165	29359	54933	60183							
		>15.5													

For SI: 1 inch = 25.4 mm, 1 pound = 4.45 N, 1 psi = 6.89 kPa

- Design capacities have been increased by a 1.33 load duration factor (C<sub>D</sub>) in accordance with Section 1612.3.3 of the UBC. Wood member design capacities include consideration of tensile stresses.
- Maximum bolt design capacities in the minimum size wood member are shown by ##.
- Maximum bolt design capacities are achieved in smaller size wood members in areas shown by c.
- Design capacities controlled by the net section tension capacity of the wood member are shown by ##.
- Maximum design capacities of wood members are achieved with connectors using fewer and/or smaller bolts or both in areas shown by ##.
- The minimum end distance, from the end of the wood member to the centerline of the first CT/T2 bolt, is seven (7) CT/T2 bolt diameters. End distance may be increased with no decrease in design capacities.
- The capacity of the concrete anchor must be equal to or greater than the design capacity of the connector being specified.
- b = width (depth) of the wood member.
- The design engineer shall check the wood member's design capacity for use conditions subject to additional loads (i.e. roof and floor dead loads). The applicable formulas and allowable stresses, per the 1991 NDS, should be used when calculating design capacities for wood members subject to a combination of bending about both axes and axial tension or compression.
- Table is based on wood type and grade, Douglas Fir-Larch, No. 2 typ., No. 1 @ 5 x 5 and larger.
- For anchor rod design capacities of ASTM A163-B7, A364-BD and A449 the A36 (F<sub>u</sub> = 58.0 ksi) tension capacities shown in the tables should be multiplied by the following factors:

Anchor Rod (Diameter)	F <sub>u</sub> (ksi)	Factor
ASTM A163-B7 (5/8 - 1 1/2)	125.0	2.155
ASTM A364-BD (5/8 - 1 1/2)	150.0	2.586
ASTM A449 (5/8 - 1)	120.0	2.069
ASTM A449 (1 1/8 - 1 1/2)	105.0	1.810

Design capacities are based upon allowable stress design.

JOB NAME: <b>1918 E Glenwood Place</b>	JOB NO: <b>R-Voit-01D</b>	SHEET NO: <b>L-7</b>
	ENGINEER: <b>MEO'</b>	DATE: <b>Oct '11</b>
ANALYSIS: <b>General</b>		

## Wall Angle Brackets at Purlins and GLBS

### GLB Wall anchorage

FEMA & COLA require that the effects of the pilaster be considered.

Regular Trib = 4'

Trib w/ pilaster effect = assume double = 8'

↳ This would be 1/3 of panel Length (Conservative)

OK

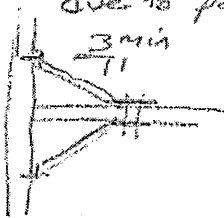
### Epoxy

based on previous calc, each anchor good for 4.0' of Trib  
we will be providing a pair of anchors (1 each side)  
so capacity is 8'

OK

### Hardware

due to panel joint & other obstructions, provide angle kickers



$$\text{Load } 8' \times 465 \text{ plf} = \frac{3720 \text{ \#}}{2 \text{ braces}} = 1860 \text{ \#/brace}$$

increase due to skew



$$1860 \times \frac{\sqrt{1^2 + 3^2}}{3} = 1960 \text{ \#}$$

L3x3x1/4 w/ 1960# tension/compression  
per AISC 13<sup>th</sup> p.4-173 Table 4-11

capacity for 9' long 6.33k < 1.96k  
OK

### Hardware bolts

$$\frac{1860 \text{ \#}}{2 \text{ bolts}} = 930 \text{ \# in } 5/8" \text{ GLB}$$

NDS p.90 Table 11I 5/8" stl, double shear, Z11, DF, 5/8" ϕ  
capacity 2440#

$$\frac{3720 \text{ \#}}{2440 \text{ \#/bolt}} = 1.5 \Rightarrow \underline{2 \text{ bolts}}$$

(2) 5/8" ϕ AB  
req'd



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**PROFIS Anchor 2.1.4**

Company: National Engineering & Consulting  
 Specifier: MEO  
 Address:  
 Phone | Fax: - | -  
 E-Mail:

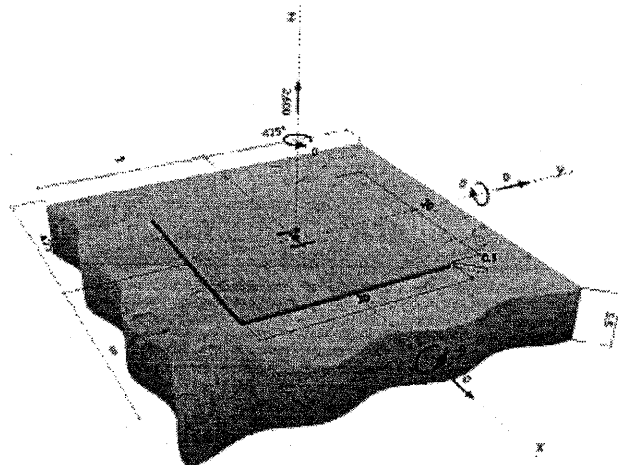
Page: 1  
 Project: 5.5" Thick Concrete  
 Sub-Project | Pos. No.:  
 Date: 7/6/2011

**Specifier's comments:**

**Input data**

Anchor type and diameter: HIT-RE 500-SD + HAS, 5/8  
 Effective embedment depth:  $h_{e,req} = 4.000$  in. ( $h_{e,max} = 4.000$  in.)  
 Material: ASTM F 568M Class 5.8  
 Evaluation Service Report: ESR 2322  
 Issued | Valid: 4/1/2010 | -  
 Proof: design method ACI 318 / AC308  
 Stand-off installation:  $e_s = 0.000$  in. (no stand-off);  $t = 0.500$  in.  
 Anchor plate:  $l_p \times l_p \times t = 20.000 \times 20.000 \times 0.500$  in. (Recommended plate thickness: not calculated)  
 Profile: S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
 Base material: cracked concrete, 2500,  $f'_c = 2500$  psi;  $h = 5.500$  in., Temp. short/long: 70/70°F  
 Installation: hammer drilled hole, installation condition: dry  
 Reinforcement: tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: > No. 4 bar  
 Seismic loads (cat. C, D, E, or F): yes (D.3.3.5)

**Geometry [in.] & Loading [lb, in.-lb]**



**roof I Utilization (Governing Cases)**

Loading	Proof	Design values [lb]		Utilization [%]	Status
		Load	Capacity	$\beta_u / \beta_v$	
Tension	Bond Strength	2600	2601	100 / -	OK
Shear	-	-	-	-	-

**Warnings**

Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for agreement with the existing conditions and for plausibility!  
 PROFIS Anchor (c) 2003-2009 Hilti AG, FL-9494 Schaan. Hilti is a registered Trademark of Hilti AG, Schaan.



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**PROFIS Anchor 2.1.41**

Company: National Engineering & Consulting  
 Specifier: MEO  
 Address:  
 Phone / Fax: - / -  
 E-Mail:

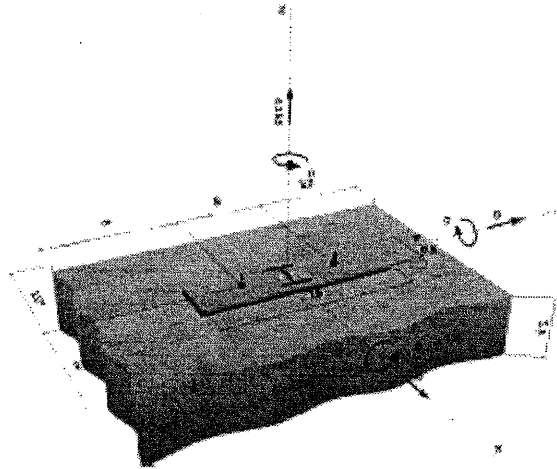
Page: 1  
 Project: 5.5" Thick Concrete  
 Sub-Project / Pos. No.:  
 Date: 7/8/2011

**Specifier's comments:**

**Input data**

**Anchor type and diameter:** HIT-RE 500-SD + HAS, 5/8  
**Effective embedment depth:**  $h_{e,req} = 3.719$  in. ( $h_{e,max} = 4.000$  in.)  
**Material:** ASTM F 568M Class 5.8  
**Evaluation Service Report:** ESR 2322  
**Issued / Valid:** 4/1/2010 | -  
**Proof:** design method ACI 318 / AC308  
**Stand-off installation:**  $e_s = 0.000$  in. (no stand-off);  $t = 0.500$  in.  
**Anchor plate:**  $l_x \times l_y \times t = 4.000 \times 16.000 \times 0.500$  in. (Recommended plate thickness: not calculated)  
**Profile:** S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
**Base material:** cracked concrete, 2500,  $f'_c = 2500$  psi;  $h = 5.500$  in., Temp. short/long: 70/70°F  
**Installation:** hammer drilled hole, installation condition: dry  
**Reinforcement:** tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: > No. 4 bar  
**Seismic loads (cat. C, D, E, or F):** yes (D.3.3.5)

**Geometry [in.] & Loading [lb, in.-lb]**



**Proof / Utilization (Governing Cases)**

Loading	Proof	Design values [lb]		Utilization [%]	Status
		Load	Capacity		
Tension	Bond Strength	4150	4152	100 / -	OK
Shear	-	-	-	- / -	-

**Warnings**

• Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

input data and results must be checked for agreement with the existing conditions and for plausibility:  
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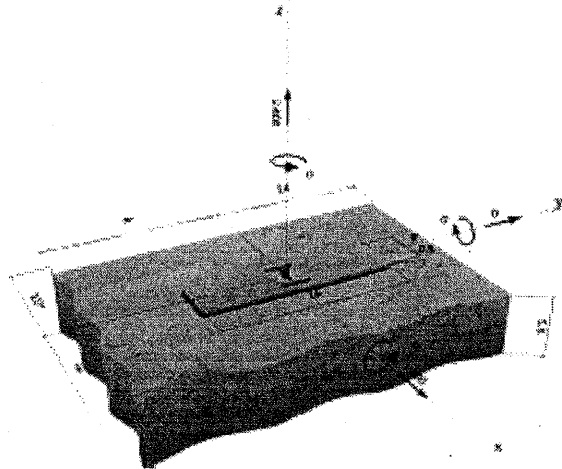
PROFIS Anchor 2.1.4

Company: National Engineering & Consulting  
 Specifier: MEO  
 Address:  
 Phone | Fax: - | -  
 E-Mail:

Page: 1  
 Project: 5.5" Thick Concrete  
 Sub-Project | Pos. No.:  
 Date: 7/6/2011

**Specifier's comments:**
**Input data**

**Anchor type and diameter:** HIT-RE 500-SD + HAS, 5/8  
**Effective embedment depth:**  $h_{e,act} = 3.768$  in. ( $h_{e,max} = 4.000$  in.)  
**Material:** ASTM F 568M Class 5.8  
**Evaluation Service Report:** ESR 2322  
**Issued | Valid:** 4/1/2010 | -  
**Proof:** design method ACI 318 / AC308  
**Stand-off installation:**  $e_s = 0.000$  in. (no stand-off);  $t = 0.500$  in.  
**Anchor plate:**  $l_p \times l_p \times t = 4.000 \times 16.000 \times 0.500$  in. (Recommended plate thickness: not calculated)  
**Profile:** S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
**Base material:** cracked concrete, 2500,  $f'_c = 2500$  psi;  $h = 5.500$  in., Temp. short/long: 70/70°F  
**Installation:** hammer drilled hole, installation condition: dry  
**Reinforcement:** tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: > No. 4 bar  
**Seismic loads (cat. C, D, E, or F):** yes (D.3.3.5)

**Geometry [in.] & Loading [lb, in.-lb]**

**Proof | Utilization (Governing Cases)**

Loading	Proof	Design values [lb]		Utilization [%]	Status
		Load	Capacity	$R_n/\beta_n$	
Tension	Bond Strength	2400	2448	98 / -	OK
Shear	Steel Strength (without lever arm)	900	4128	- / 22	OK
Loading	$\beta_n$	$\beta_v$	$\xi$	Utilization $\beta_{n,v}$ [%]	Status
Combined tension and shear loads	0.080	0.218	-	100	OK

**Warnings**

• Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for agreement with the existing conditions and for plausibility!

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December 8, 2011

City of Santa Ana – Building & Safety Division

RE: 1918 E. Glenwood Place  
Plan Check # 10173637

Glenwood

**Plan check responses:**

**Comment #5:**

*The drawings/information submitted for Building Safety Division review is incomplete.....-  
Provide required disable accessible upgrade proposal with plans.*

**-Response: See sheet A-1, which shows proposed ADA upgrades**

**Comment #6:**

*This review does not include mechanical, plumbing, fire sprinkler system, or electrical work....*

**-Response: That is correct, there is no mechanical, plumbing, fire sprinkler system or electrical work proposed.**

**Comment #7:**

*The applicant shall obtain clearances/approvals....*

**-Response:**

**Comment #8:**

*Show on the plans:*

- Occupancy Classificaton(s)
- Type of construction
- Fire Sprinkler System

**-Response: information is now shown on sheet T-1.**

**Comment #9:**

*It is the project designer's/property owner's responsibility to show compliance on the drawings with all applicable Federal and State Accessibility Standards*

**-Response: Proposed ADA upgrades are now shown on the new sheet A-1**

**Comment #10:**

*Drawings submitted to the Building Division for review shall provide the following information to insure compliance with CBC Section 1134B/Chapter 11B:*

- An accessible entrance

- An accessible route to the altered area
- Accessible restrooms
- Accessible telephone (if any)
- Accessible drinking fountains, and
- Parking, signage and alarms

**-Response: see sheet A-1**

**Comment #11:**

*Priority shall be given to those elements that will provide the greatest access in the above order.*

**-Response: see sheet A-1**

**Comment #11:**

*Valuation of proposed project is calculated as \$30,000. A minimum of 20% of valuation of construction is required to be spent toward providing disable access....*

**-Response: see sheet A-1**

**Comment #13:**

*Provide completed disabled accessible compliance form (attached) with each project.*

**-Response: see the enclosed forms**

**Comment #14:**

*Provide ICC or LARR listing number on plans for Zone 4 hardware*

**Response:** Complied. The LARR is 25334 and approved as of November 1, 2011. See structural plans detail 4/SD-1. As part of this approval, Zone4 revamped their product line and developed new capacities which I have attached.

- The old continuity tie T2-44-6 is now a T2-44-5 with greater capacity (Details 2 & 6/SD1).
- The old wall anchor T2-24-6 is now a T2-24-4 with greater capacity (Detail 4/SD1).

Since the Zone4 tension rod diameter is now smaller, the epoxy needs to be rechecked at the purlin wall anchors. The subpurlin and glulam wall anchorage were not changed. New calculations for the 1/2" dia epoxied wall anchor in the Zone4 hardware has been recalculated and attached.

Sincerely,

**Michael O'Brien, S.E.  
National Engineering & Consulting, Inc.**

**Michael Santillan, Architect  
National Engineering & Consulting, Inc.**

27 Orchard  
Lake Forest, CA 92630

(714) 803-8454





*Plan check #1*

**Structural Calculations**  
**Roof Seismic Strengthening - Partial**  
**Concrete Tilt-up Building**  
**1918 E Glenwood Place (Bldg D)**  
**Santa Ana, CA**

R-Voit-01D



**Revision**



**December 5, 2011**

27 Orchard, Suite 200  
Lake Forest, CA 92630  
Phone: (949) 716-9990 Fax: (949) 716-9997  
[www.national-eng.com](http://www.national-eng.com)

The structural calculations contained in this report relate only to the structure and site for which they were prepared. Referenced building codes, site-specific parameters for wind and seismic design, and any cited material/component design standards are current only for the governmental agency with jurisdiction over the design and construction of the proposed structure at the time the report was published. Some information utilized in the structural calculations may have been received from outside sources such as third party site development coordinators, geotechnical engineering reports, pre-engineered component manufacturers, or engineering/trade organizations. NEC is not responsible for the accuracy and/or changes to any information utilized herein as provided by outside sources.

**TABLE B - COLA Chapter 91 & 96 CT or T2 PAIRED CONNECTION ASD CAPACITIES** 1,2,3,4,5,6,7,8  
 DF-L No. 2 Grade typ., No. 1 @ 5x5 & larger

CT Model # 2 rfd	A307 Anchor Rod Diarm. 2 rfd (1/8" increments) #	A307 Bolts Quantity & Diameter (in)	b min. width of attached member (depth) rfd (in)	CT Paired Connection ASD Design Capacities (pounds)							$\Delta_s$ @ max. strength capacity ?	$\Delta_{ASD}$ @ max. allow. capacity ?	
				min. l (in), length of bolt in wood members each side of CT (thickness)									
				1.5	2.5	3	3.5	5.125	5.5	7.25/7.50			
CT or T2-43	4	(4) 3/8	3.5	5,010	6,260 <sup>g</sup>	6,260 <sup>g</sup>	6,260 <sup>g</sup>	6,260 <sup>g</sup>	6,260 <sup>g</sup>	6,260 <sup>g</sup>	6,260 <sup>g</sup>	0.169	0.120
CT or T2-24	4	(2) 1/2		3,360	5,600	6,235	6,235	6,235	6,235	6,235	6,235	0.229	0.154
CT or T2-44	5	(4) 1/2		6,637	11,118	11,606 <sup>g</sup>	11,606 <sup>g</sup>	11,606 <sup>g</sup>	11,606 <sup>g</sup>	11,606 <sup>g</sup>	11,606 <sup>g</sup>	11,606 <sup>g</sup>	0.194
CT or T2-64	6	(6) 1/2	5.5	[7,138]	[11,897]	[14,276]	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	0.173	0.124
				9,679	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>	15,577 <sup>g</sup>		
CT or T2-84	7	(8) 1/2	3.5	[7,138]	[11,897]	[14,276]	[16,656]	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	0.153	0.110
			5.5	[10,662]	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>		
			7.25/7.5	12,377	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>	17,358 <sup>g</sup>			
CT or T2-46	8	(4) 3/4	5.5	9,749	18,315 <sup>g</sup>	18,315 <sup>g</sup>	18,315 <sup>g</sup>	18,315 <sup>g</sup>	18,315 <sup>g</sup>	18,315 <sup>g</sup>	18,315 <sup>g</sup>	0.133	0.095
CT or T2-48	9	(4) 1	5.5	[9,345]	[15,576]	[18,691]	[21,806]	[30,020]	30,249 <sup>g</sup>	30,249 <sup>g</sup>	30,249 <sup>g</sup>	0.142	0.101
			7.25/7.5	[12,029]	[20,048]	[24,057]	[28,067]	30,249 <sup>g</sup>	30,249 <sup>g</sup>	30,249 <sup>g</sup>			
			9.25/9.5	12,591	21,513	25,939	30,249 <sup>g</sup>	30,249 <sup>g</sup>	30,249 <sup>g</sup>	30,249 <sup>g</sup>			
CT or T2-66	11	(6) 1	5.5	[9,345]	[15,576]	[18,691]	[21,806]	[30,020]	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>	0.126	0.090
			7.25/7.5	[12,029]	[20,048]	[24,057]	[28,067]	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>			
			9.25/9.5	[14,590]	[24,317]	[29,190]	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>			
			11.25/11.5	[16,504]	[27,506]	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>			
			13.25/13.5	16,622	29,652	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>	30,474 <sup>g</sup>			

or S: 1 inch (in) = 25.4 mm, 1 pound = 4.45 N

Wood design capacities have been increased by a 1.60 load duration factor ( $C_D$ ).

CT #y

CT = paired continuity tie  
 a = number of bolts

b = diameter of bolts (in 1/8 inch increments)

y = diameter of All-thread/Anchor Rod specified by designer (in 1/8 inch increments)

Design capacity controlled by the net cross-section tension capacity of the wood member at bolts are shown by [##]

The capacity of the concrete anchor must be equal to or greater than the design capacity of the connector being specified.

The minimum end distance, from the end of the wood member to the centerline of the first CT bolt, is seven (7) CT bolt diameters. End distance may be increased with no decrease in design capacities.

Values are controlled by device capacity @ 1/8" deflection, as tested in a steel jig, divided by 5

Deflections at loads less than maximum  $P_S$  or  $P_{ASD}$  may be determined by multiplying by the ratio of the lesser load to the maximum load. Strength loads are the  $P_{ASD}$  shown times 1.4. Tabulated displacement consists of deformation and rotation of the hold-down (tie-down), and fastener slip of (bolt rotation) used to attach the hold-down (tie-down) to the wood member. Shrinkage of supporting wood members and anchor bolt/rod elongation shall be the responsibility of the Engineer of Record.

The user should note that hold-downs used in series shall account for the cumulative deformation of all hold-downs (tie-downs) within said series.

The assembly must have an allowable strength equal to or greater than the required strength of the assembly under the action of the ASD load combinations referenced in the applicable code.

Wall tie T2-24-4 New 6235# 5071# T2-24-6 OK  
 Cent tie T2-44-5 11,606 10365 T2-44-6 OK

## Epoxy Anchorage Design

In accordance with Section 1908.1.9 of the 2010 CBC, the epoxy anchorage to the wall need only be designed for the applied design force without consideration of the usual requirement for either a ductile (steel) failure or an Omega overstrength factor.

Therefore, the Seismic loads switch for seismic design categories C, D, E & F can be turned off (set to "no") on the Hilti Profis design.                      Seismic loads (cat. C, D, E, or F):    no

**1908.1.9 ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.4 and D.3.3.5 to read as follows:**

D.3.3.4 – Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.5 or D.3.3.6 is satisfied.

***Exceptions:***

1. *Anchors in concrete designed to support non-structural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.*
2. *Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.4.*



**PROFIS Anchor 2.2.3**

www.hilti.us

Company: National Engineering & Consulting  
 Specifier: NAL  
 Address: -|-  
 Phone / Fax: -|-  
 E-Mail: -|-

Page: 1  
 Project: 5.5" Thick conc 2-.5-in r  
 Sub-Project / Pos. No.:  
 Date: 12/5/2011

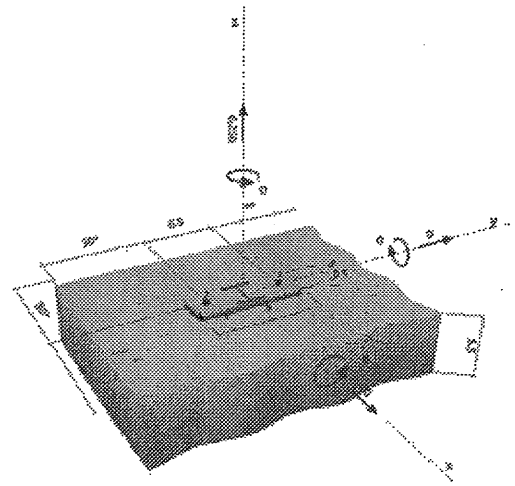
Specifier's comments:

**Input data**

Anchor type and diameter: HIT-RE 500-SD + HAS, 1/2"  
 Effective embedment depth:  $h_{\text{eff}} \leq 3.750 \text{ in.}$  ( $h_{\text{max}} = - \text{in.}$ )  
 Material: ASTM F 568M Class 5.8  
 Evaluation Service Report: ESR 2322  
 Issued / Valid: 4/1/2010 / -  
 Proof: design method ACI 318 / AC308  
 Stand-off installation:  $e_s = 0.000 \text{ in.}$  (no stand-off);  $t = 0.500 \text{ in.}$   
 Anchor plate:  $l_p \times l_t \times t = 3.000 \times 9.000 \times 0.500 \text{ in.}$  (Recommended plate thickness: not calculated)  
 Profile: S shape (AISC); (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
 Base material: cracked concrete, 2500,  $f'_c = 2500 \text{ psi}$ ;  $h = 5.500 \text{ in.}$ , Temp. short/long: 70/70°F  
 Installation: hammer drilled hole, installation condition: dry  
 Reinforcement: tension: condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: none or < No. 4 bar  
 Seismic loads (cat. C, D, E, or F): no

3.75" embed required > OK  
 4" embed used

**Geometry [in.] & Loading [lb, in.-lb]**



**Proof / Utilization (Governing Cases)**

Loading	Proof	Design values [lb]		Utilization [%]	
		Load	Capacity	$R_d/R_r$	Status
Tension	Concrete Breakout Strength	6250	6330	99/-	OK
Shear	-	-	-	+	-

demand per L-3  
 3091 # OK

**Warnings**

Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**



*Plan Check #1*

**Structural Calculations**  
**Roof Seismic Strengthening - Partial**  
**Concrete Tilt-up Building**  
**1918 E Glenwood Place (Bldg D)**  
**Santa Ana, CA**

R-Voit-01D



**Revision**



**December 5, 2011**

27 Orchard, Suite 200  
Lake Forest, CA 92630  
Phone: (949) 716-9990 Fax: (949) 716-9997  
[www.national-eng.com](http://www.national-eng.com)

The structural calculations contained in this report relate only to the structure and site for which they were prepared. Referenced building codes, site-specific parameters for wind and seismic design, and any cited material/component design standards are current only for the governmental agency with jurisdiction over the design and construction of the proposed structure at the time the report was published. Some information utilized in the structural calculations may have been received from outside sources such as third party site development coordinators, geotechnical engineering reports, pre-engineered component manufacturers, or engineering/trade organizations. NEC is not responsible for the accuracy and/or changes to any information utilized herein as provided by outside sources.

**TABLE B - COLA Chapter 91 & 96 CT or T2 PAIRED CONNECTION ASD CAPACITIES<sup>1,2,3,4,5,6,7,8</sup>**  
**DF-L No. 2 Grade typ., No. 1 @ 5x5 & larger**

CT Model <sup>2</sup> 2 rfd	A307 Anchor Rod Diarm. 2 rfd (1/8" increments) <sup>4</sup>	A307 Bolts Quantity & Diameter (in)	b min. width of attached member (depth) rfd (in)	CT Paired Connection ASD Design Capacities (pounds)								Δ <sub>s</sub> @ max. strength capacity <sup>7</sup>	Δ <sub>ASD</sub> @ max. allow. capacity <sup>7</sup>
				min. l (in), length of bolt in wood members each side of CT (thickness)									
				1.5	2.5	3	3.5	5.125	5.5	7.25/7.50			
CT or T2-43	4	(4) 3/8	3.5	5,010	6,260 <sup>5</sup>	6,260 <sup>5</sup>	6,260 <sup>5</sup>	6,260 <sup>5</sup>	6,260 <sup>5</sup>	6,260 <sup>5</sup>	6,260 <sup>5</sup>	0.169	0.120
CT or T2-24	4	(2) 1/2		3,360	5,600	6,235	6,235	6,235	6,235	6,235	6,235	0.228	0.164
CT or T2-44	5	(4) 1/2		6,637	11,118	11,606 <sup>5</sup>	11,606 <sup>5</sup>	11,606 <sup>5</sup>	11,606 <sup>5</sup>	11,606 <sup>5</sup>	11,606 <sup>5</sup>	0.194	0.139
CT or T2-64	6	(6) 1/2	5.5	[7,138]	[11,897]	[14,276]	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	0.173	0.124
				9,679	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>	15,577 <sup>5</sup>		
CT or T2-84	7	(8) 1/2	3.5	[7,138]	[11,897]	[14,276]	[16,658]	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	0.153	0.110
			5.5	[10,662]	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>		
			7.25/7.5	12,377	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>	17,358 <sup>5</sup>			
CT or T2-46	8	(4) 3/4	5.5	9,749	10,315 <sup>5</sup>	10,315 <sup>5</sup>	10,315 <sup>5</sup>	10,315 <sup>5</sup>	10,315 <sup>5</sup>	10,315 <sup>5</sup>	10,315 <sup>5</sup>	0.133	0.095
CT or T2-48	9	(4) 1	5.5	[9,345]	[15,376]	[18,691]	[21,806]	[30,020]	30,249 <sup>5</sup>	30,249 <sup>5</sup>	30,249 <sup>5</sup>	0.142	0.101
			7.25/7.5	[12,029]	[20,048]	[24,057]	[28,067]	30,249 <sup>5</sup>	30,249 <sup>5</sup>	30,249 <sup>5</sup>			
			9.25/9.5	12,601	21,513	25,939	30,249 <sup>5</sup>	30,249 <sup>5</sup>	30,249 <sup>5</sup>	30,249 <sup>5</sup>			
CT or T2-68	11	(6) 1	5.5	[9,345]	[15,376]	[18,691]	[21,806]	[30,020]	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>	0.126	0.090
			7.25/7.5	[12,029]	[20,048]	[24,057]	[28,067]	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>			
			9.25/9.5	[14,590]	[24,317]	[29,180]	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>			
			11.25/11.5	[16,504]	[27,506]	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>			
			13.25/13.5	16,622	29,652	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>	30,474 <sup>5</sup>			

or SI: 1 inch (in) = 25.4 mm, 1 pound = 4.45 N

Wood design capacities have been increased by a 1.60 load duration factor (C<sub>D</sub>).

CT a-b-y

CT = paired continuity tie  
 a = number of bolts

b = diameter of bolts (in 1/8 inch increments)

y = diameter of All-thread/Anchor Rod specified by designer (in 1/8 inch increments)

Design capacity controlled by the net cross-section tension capacity of the wood member at bolts are shown by [##]

The capacity of the concrete anchor must be equal to or greater than the design capacity of the connector being specified.

The minimum end distance, from the end of the wood member to the centerline of the first CT bolt, is seven (7) CT bolt diameters. End distance may be increased with no decrease in design capacities.

Values are controlled by device capacity @ 1/8" deflection, as tested in a steel jig, divided by 5

Deflections at loads less than maximum P<sub>S</sub> or P<sub>ASD</sub> may be determined by multiplying by the ratio of the lesser load to the maximum load. Strength loads are the P<sub>ASD</sub> shown times 1.4. Tabulated displacement consists of deformation and rotation of the hold-down (tie-down), and fastener slip of (bolt rotation) used to attach the hold-down (tie-down) to the wood member. Shrinkage of supporting wood members and anchor bolt/rod elongation shall be the responsibility of the Engineer of Record.

The user should note that hold-downs used in series shall account for the cumulative deformation of all hold-downs (tie-downs) within said series.

The assembly must have an allowable strength equal to or greater than the required strength of the assembly under the action of the ASD load combinations referenced in the applicable code.

Wall tie	T2-24-4	New 6235 <sup>#</sup>	5071 <sup>#</sup>	T2-24-6	OK
Cent tie	T2-44-5	11,606	10365	T2-44-6	OK

## Epoxy Anchorage Design

In accordance with Section 1908.1.9 of the 2010 CBC, the epoxy anchorage to the wall need only be designed for the applied design force without consideration of the usual requirement for either a ductile (steel) failure or an Omega overstrength factor. Therefore, the Seismic loads switch for seismic design categories C, D, E & F can be turned off (set to "no") on the Hilti Profis design.                      Seismic loads (cat. C, D, E, or F):    no

**1908.1.9 ACI 318, Section D.3.3. Modify ACI 318, Sections D.3.3.4 and D.3.3.5 to read as follows:**

D.3.3.4 – Anchors shall be designed to be governed by the steel strength of a ductile steel element as determined in accordance with D.5.1 and D.6.1, unless either D.3.3.5 or D.3.3.6 is satisfied.

***Exceptions:***

1. *Anchors in concrete designed to support non-structural components in accordance with ASCE 7 Section 13.4.2 need not satisfy Section D.3.3.4.*
2. *Anchors designed to resist wall out-of-plane forces with design strengths equal to or greater than the force determined in accordance with ASCE 7 Equation 12.11-1 or 12.14-10 need not satisfy Section D.3.3.4.*

L-9 (1)



**PROFIS Anchor 2.2.3**

www.hilti.us

Company: National Engineering & Consulting  
 Specifier: NAL  
 Address:  
 Phone / Fax: - / -  
 E-Mail:

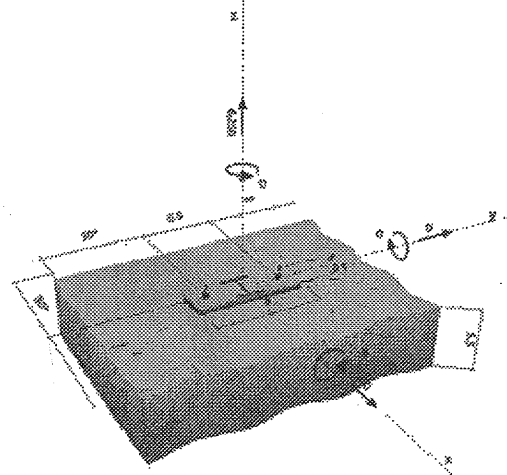
Page: 1  
 Project: 5.5" Thick conc 2.-5-in r  
 Sub-Project / Pos. No.:  
 Date: 12/5/2011

Specifier's comments:

**Input data**

Anchor type and diameter: HIT-RE 500-SD + HAS, 1/2  
 Effective embedment depth:  $h_{\text{eff}} \in 3.75 \text{ in}$  ( $h_{\text{min}} = - \text{in}$ ) *3.75" embed required > OK*  
 Material: ASTM F 568M Class 5 B  
 Evaluation Service Report: ESR 2322  
 Issued / Valid: 4/1/2010 / -  
 Proof: design method ACI 318 / AC308  
 Stand-off installation:  $e_s = 0.000 \text{ in}$  (no stand-off);  $t = 0.500 \text{ in}$   
 Anchor plate:  $l_x \times l_y \times t = 3.000 \times 9.000 \times 0.500 \text{ in}$ . (Recommended plate thickness: not calculated)  
 Profile: S shape (AISC), (L x W x T x FT) = 3.000 in. x 2.330 in. x 0.170 in. x 0.260 in.  
 Base material: cracked concrete, 2500,  $f'_c = 2500 \text{ psi}$ ;  $h = 5.500 \text{ in}$ ., Temp. short/long: 70/70°F  
 Installation: hammer drilled hole, installation condition: dry  
 Reinforcement: tension; condition B, shear: condition B; no supplemental splitting reinforcement present  
 edge reinforcement: none or < No. 4 bar  
 Seismic loads (cat. C, D, E, or F): no

**Geometry [in.] & Loading [lb, in.-lb]**



**Proof / Utilization (Governing Cases)**

Loading	Proof	Load	Design values [lb]		Utilization [%]	Status
			Capacity			
Tension	Concrete Breakout Strength	6250	6330		99 / -	OK
Shear	-	-	-	-	+	-

*demand per L-3  
3091 # OK*

**Warnings**

Please consider all details and hints/warnings given in the detailed report!

**Fastening meets the design criteria!**

Input data and results must be checked for agreement with the existing conditions and for plausibility!  
 PROFIS Anchor (c) 2003-2009 Hilti AG, FL-6494 Schaan. Hilti is a registered trademark of Hilti AG, Schaan.



# VOLUNTARY SEISMIC STRENGTHENING

## AN INDUSTRIAL BLDG. RETROFIT

1918 E. GLENWOOD BLDG. D

SANTA ANA CA. 92705

### PROJECT TEAM:

#### OWNER:

OWNER: ROB SOCCI  
ADDRESS: 3500 W. ORANGEWOOD AVE.  
CITY, STATE ZIP: ORANGE, CA 92868  
PHONE: (714) 935-2314

#### APPLICANT:

NAME: NATIONAL ENGINEERING & CONSULTING, INC.  
ADDRESS: 27 ORCHARD  
CITY, STATE ZIP: LAKE FOREST, CA 92630-8304  
PHONE: (949) 766-9990 X. 510  
FAX: (949) 716-9997  
CONTACT: MIKE O'BRIEN  
E-MAIL: mike.obrien@nationaleng.com

#### STRUCTURAL ENGINEER:

NAME: NATIONAL ENGINEERING & CONSULTING, INC.  
ADDRESS: 27 ORCHARD  
CITY, STATE ZIP: LAKE FOREST, CA 92630-8304  
PHONE: (949) 766-9990 X. 570  
FAX: (949) 716-9997  
CONTACT: MIKE O'BRIEN  
E-MAIL: mike.obrien@nationaleng.com

### PROJECT DESCRIPTION:

THE BUILDING CONSISTS OF A CONCRETE TILT-UP BUILDING WITH A PANELIZED WOOD ROOF DIAPHRAGM. THE PROJECT CONSISTS OF A VOLUNTARY PARTIAL SEISMIC REHABILITATION OF AN EXISTING INDUSTRIAL BUILDING. THE SCOPE OF THE PROJECT IS LIMITED TO WALL ANCHORAGE AND CONTINUITY TIES.

THE PARTIAL SEISMIC REHABILITATION IS BEING PERFORMED ON A VOLUNTARY BASIS DUE TO OWNER'S REQUEST. THERE IS CURRENTLY NO MANDATE FOR SEISMIC STRENGTHENING FROM THE CITY OF SANTA ANA FOR THIS PROPERTY. THE DESIGN OF THE REHABILITATION IS BASED ON THE REQUIREMENTS OF INTERNATIONAL EXISTING BUILDING CODE CHAPTER A2.

ALSO, WORK INCLUDES MINOR ADA UPGRADES:

1. RE-STRIPE (E) HC PARKING SPACES TO MEET CURRENT CODE STANDARDS.
2. REMOVE (E) LAVATORY CABINET AT (2) RESTROOMS. INSTALL (N) ACCESSIBLE SINK.
3. REPLACE (2) DOORKNOBS W/ (N) 'LEVER-TYPE' HARDWARE.

### CODE COMPLIANCE:

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THE LATEST EDITIONS OF THE FOLLOWING CODES.

1. 2010 CALIFORNIA ADMINISTRATIVE CODE.
2. 2010 CALIFORNIA BUILDING CODE (CBC).
3. 2010 CALIFORNIA ELECTRICAL CODE (CEC).
4. 2010 CALIFORNIA ENERGY CODE.
5. 2010 CALIFORNIA MECHANICAL CODE (CMC).
6. 2010 CALIFORNIA PLUMBING CODE (CPC).
7. ANSI/TIA-222-G LIFE SAFETY CODE NFPA-101
8. LOCAL BUILDING CODE
9. CITY/COUNTY ORDINANCES

### PROJECT INFORMATION:

#### PROPERTY INFORMATION:

JURISDICTION:  
BUILDING AREA:  
LOT AREA:  
CURRENT ZONING:  
CONSTRUCTION TYPE:  
SPRINKLERS?:  
OCCUPANCY GROUP:  
NO. OF STORIES:  
HEIGHT:  
PLAN CHECK NUMBER:

CITY OF SANTA ANA  
15,859 FT. (APPROX & UNCHANGED)  
30,492 FT. (APPROX & UNCHANGED)  
(UNCHANGED)  
V-B (UNCHANGED)  
NO  
B, S-1  
1 (UNCHANGED)  
19'± (UNCHANGED)

ALL STRUCTURAL & MECHANICAL PLANS ARE REQUIRED FOR CONSTRUCTION

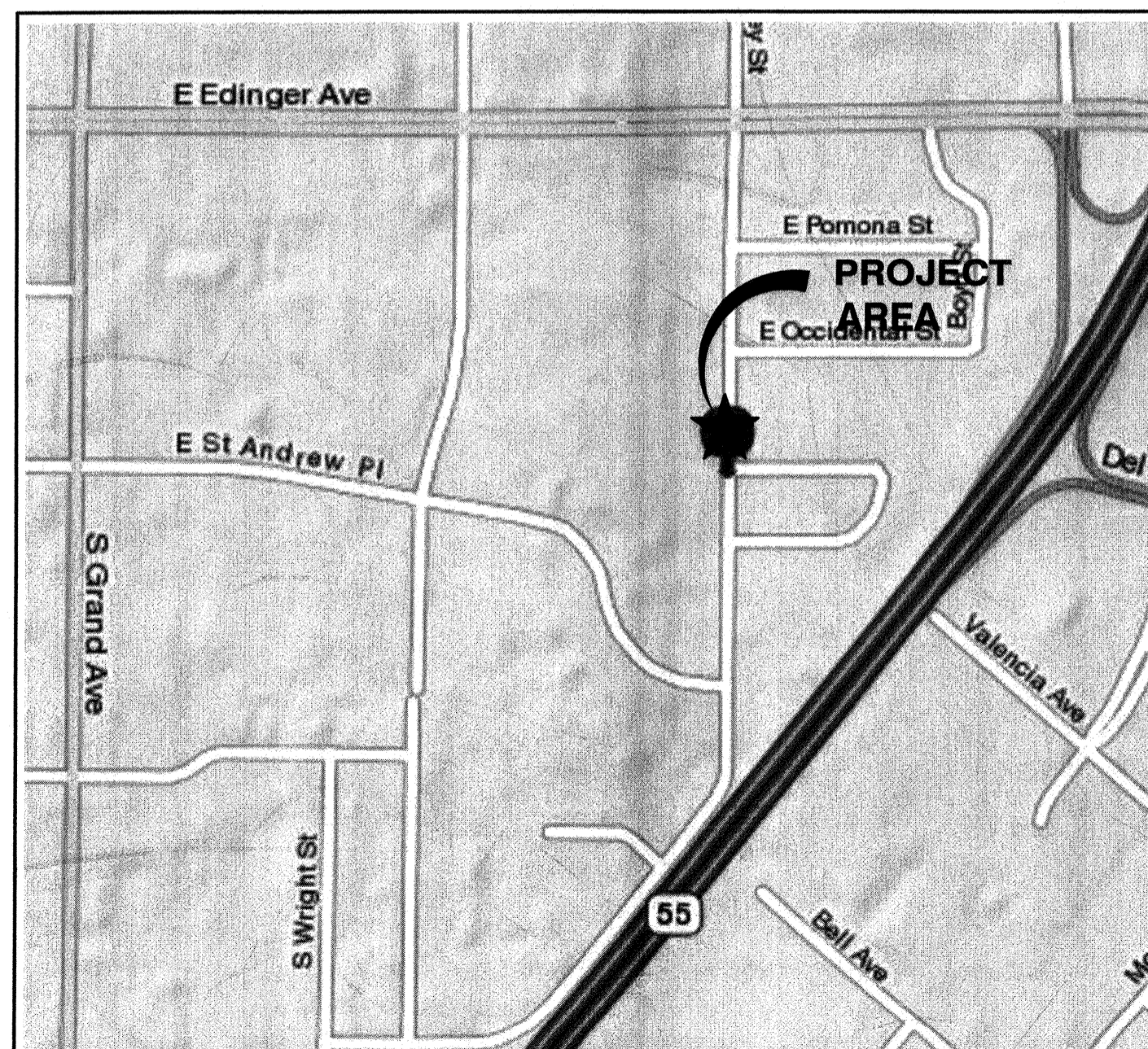
ALL STRUCTURAL & MECHANICAL PLANS ARE REQUIRED FOR CONSTRUCTION. ANY CHANGES TO THESE PLANS MUST BE KEPT ON THE PROJECT AND APPROVED BY THE ENGINEER IN WRITING BEFORE CONSTRUCTION.

ALL STRUCTURAL & MECHANICAL PLANS ARE REQUIRED FOR CONSTRUCTION. ANY CHANGES TO THESE PLANS MUST BE KEPT ON THE PROJECT AND APPROVED BY THE ENGINEER IN WRITING BEFORE CONSTRUCTION.

Date: \_\_\_\_\_  
SANTA ANA

### SHEET INDEX:

	DESCRIPTION:
T-1	TITLE SHEET
T-2	ALTA SURVEY (FOR REFERENCE ONLY)
(A-1)	ADA UPGRADES
SN-1	GENERAL NOTES & SPECIFICATIONS
S-1	ROOF FRAMING PLAN
SD-1	DETAILS



VICINITY MAP  
NTS

Date: \_\_\_\_\_  
SANTA ANA

BLDG F

BLDG A

ST. ANDREW PL.

BLDG B

AREA OF WORK

BLDG D

E. GLENWOOD PL.

BLDG C

- Subject To The Following Approvals:
- Planning Department
  - Fire Department
  - Police Department
  - Public Works Agency
  - Grading Permit
  - County of Orange Health Department
  - Cal / OSHA
  - Flood Plain
  - School District
  - Park Acquisition and Development

- Subject To The Following Approvals:
- Planning Department
  - Fire Department
  - Police Department
  - Public Works Agency
  - Grading Permit
  - County of Orange Health Department
  - Cal / OSHA
  - Flood Plain
  - School District
  - Park Acquisition and Development

#### ARCHITECTURAL STRUCTURAL ACCEPTED FOR CONSTRUCTION

SEPARATE PERMITS ARE REQUIRED FOR MECHANICAL, PLUMBING & ELECTRICAL WORK. THIS SET OF PLANS AND SPECIFICATIONS MUST BE KEPT ON THE JOB AT ALL TIMES AND IT IS UNLAWFUL TO MAKE ANY CHANGES OR ALTERATIONS ON SAME WITHOUT WRITTEN PERMISSION FROM THE CITY OF SANTA ANA.

THE ACCEPTANCE OF THIS PLAN AND SPECIFICATIONS SHALL NOT BE HELD TO PERMIT NOR BE AN APPROVAL OF THE VIOLATION OF ANY ORDINANCES OF ANY CITY ORDINANCE OR STATE LAW.

Accepted By: *[Signature]* Date: 12/15/11  
CITY OF SANTA ANA  
Date Issued: 3/28/12

PERMIT TYPE:	BLDG ELECT PLBG
PERMITS:	MECH. GRADING
OCC. GROUP:	B/S1
CONSTR. TYPE:	V-B NEW-F-S
CODE EDITION:	2010 CBC
FLOOD ZONE:	X
FLOOD ZONE CERTIF. REQ'D:	YES NO
MICROFILM:	YES NO
RADIANT BARRIER @ ROOF:	YES NO
RESIDENTIAL DEV. FEE:	YES NO
SCHOOL DISTRICT:	YES NO

APPROVED  
PLANNING DIVISION  
MASTER I.D.: 2011-99980  
G.P. IND. Zone M1  
PLANNER B. Apple DATE 11-7-11  
TRANSFERRED BY Ani DATE 1-3-12  
PLANNING INSPECTION REQUIRED:  
ROUGH FINAL NONE X  
NAME (714) \_\_\_\_\_  
RETAIN PLANS FOR FUTURE REVISIONS.  
SUBJECT TO ITEMS CHECKED AND CONDITIONS BELOW:  
 INTERIOR TI ONLY  
 NO EXTERIOR ALTERATIONS/MODIFICATIONS  
 ALL MATERIALS TO MATCH EXISTING  
 SCREENING REQUIRED  
 SUBMIT LANDSCAPE PLANS  
CONDITIONS:  
Seismic Retrofit.

12-15-11  
FIRE DEPARTMENT PLAN REVIEW COMPLETED - NO INSPECTION REQUIRED

RECEIVED  
DEC 06 2011  
City of Santa Ana

NATIONAL ENGINEERING & CONSULTING, INC.  
27 ORCHARD LAKE FOREST, CA. 92630  
PHONE: (949) 716-9990  
FAX: (949) 716-9997

Voluntary Seismic Strengthening  
AN INDUSTRIAL BLDG. RETROFIT  
1918 E. GLENWOOD BLDG. D  
SANTA ANA CA. 92705  
CITY SET

JOB NO. R-Vol-001-D

#### REVISION:

NO.	DATE	DESCRIPTION
10/11/11	CITY SUBMITTAL	
12/05/11	RE-SUBMITTAL	

SHEET TITLE:

TITLE PAGE

SHEET NUMBER:

T-1

**BASIS OF BEARINGS:**

THE BEARING NORTH 01° 20' 57" EAST BEING THE CENTERLINE OF RITCHEY STREET AS SHOWN ON PARCEL MAP NO. 796 RECORDED IN BOOK 52, PAGE 33 FILED IN THE OFFICE OF THE COUNTY RECORDER OF ORANGE COUNTY, STATE OF CALIFORNIA, WAS USED AS THE BASIS OF BEARINGS FOR THIS SURVEY.

**FLOOR SPACE RESTRICTIONS:**

NONE

**LEGEND:**

- N. NORTH
- S. SOUTH
- E. EAST
- W. WEST
- TYP. TYPICAL
- O.R. OFFICIAL RECORDS
- P.L. PROPERTY LINE
- CONC. CONCRETE
- C.L. CENTER LINE
- R. RECORD
- M. MEASURED
- FD. FOUND
- T.E. TRASH ENCLOSURE
- G.I. GRATE INLET
- TYP. TYPICAL
- SV. STEEL VAULT
- W.M. WATER METER
- EPB. ELECTRICAL PULL BOX
- M.H. MANHOLE
- M.W. MONITORING WELL
- L.S. LIGHT STANDARD
- S.L. STREET LIGHT
- F.H. FIRE HYDRANT
- PP. POWER POLE
- P.A. PLANTER AREA
- T. TRANSFORMER
- P.I.V. POST INDICATOR VALVE
- G.M. GAS METER
- F.D.C. FIRE DEPARTMENT CONNECTION
- W.I.F. WROUGHT IRON FENCE
- FSR. FIRE SPRINKLER RISER
- SMH. SEWER MANHOLE
- PROPERTY LINE
- CENTERLINE
- PARKING STALL
- EASEMENT LINE
- BUILDING LINE

**LAND AREA:**

<b>PARCEL 1 :</b>	<b>PARCEL 6 :</b>
51,575.04 SQUARE FEET	68,171.40 SQUARE FEET
1.184 ACRES NET	1.565 ACRES NET
<b>PARCEL 2 :</b>	<b>PARCEL 8 :</b>
31,537.44 SQUARE FEET	51,052.32 SQUARE FEET
0.724 ACRES NET	1.172 ACRES NET
<b>PARCEL 5 :</b>	<b>PARCEL 9 :</b>
50,137.56 SQUARE FEET	30,492.00 SQUARE FEET
1.151 ACRES NET	0.70 ACRES NET

**TOTAL LAND AREA:**

282,995.76 SQUARE FEET  
6.496 ACRES NET

**PARKING STALLS**

PARCEL NO.	REGULAR	HANDICAP
1	55	3
2	38	1
5	47	3
6	129	5
8	61	3
9	26	2
<b>TOTAL</b>	<b>356</b>	<b>17</b>
<b>GRAND TOTAL = 373</b>		

TOTAL PARKING REQUIRED = 204

TOTAL PARKING PROVIDED = 373

**SITE RESTRICTIONS:**

**SETBACKS :**

FRONT	10'
SIDE	N/A
REAR	N/A
ZONE	M-1 (LIGHT MANUFACTURING)
HEIGHT	35'

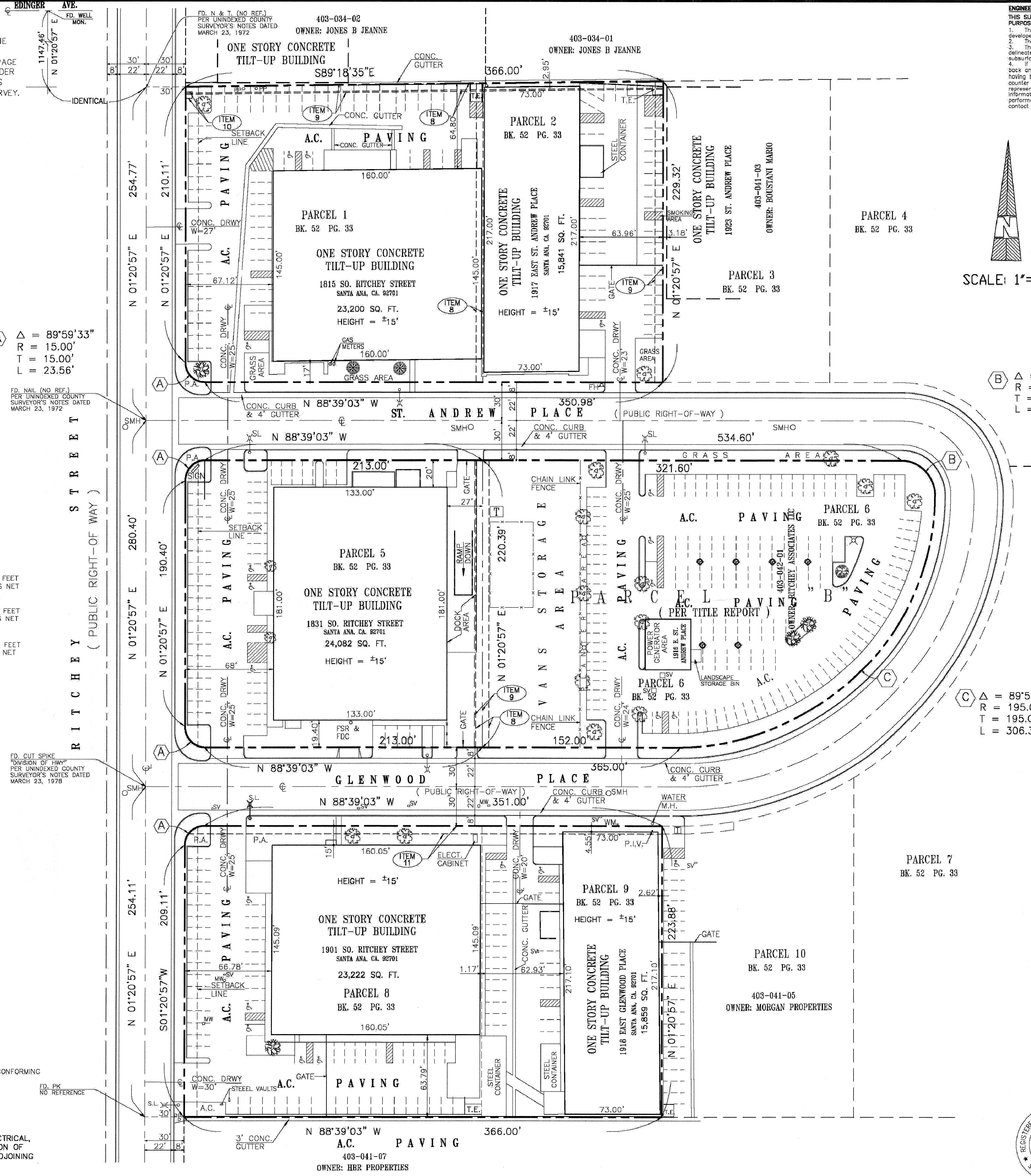
ALL SITE RESTRICTIONS WERE OBTAINED FROM THE CITY OF SANTA ANA (PLANNING DEPARTMENT)

**NOTE:**

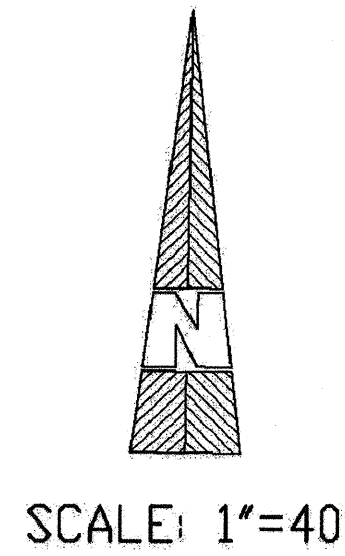
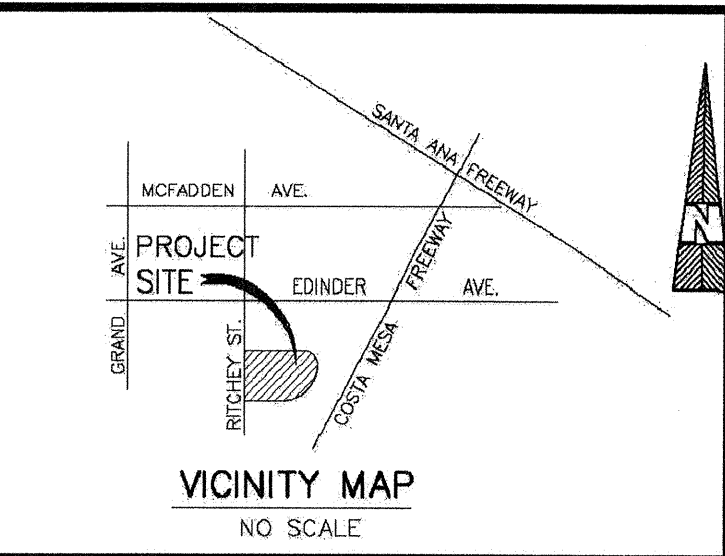
THE LANDSCAPE BUFFER SETBACK IS LEGAL AND NON-CONFORMING

**UTILITY NOTE :**

ALL UTILITY SERVICES (SEWER, WATER, GAS, ELECTRICAL, TELEPHONE, CABLE) REQUIRED FOR THE OPERATION OF THE PREMISES ENTER THE PREMISES THROUGH ADJOINING PUBLIC STREETS AND DEDICATED EASEMENTS.



**ENGINEER'S NOTES :**  
 THIS SURVEY HAS BEEN PREPARED FOR TITLE INSURANCE AND LENDING PURPOSES ONLY.  
 1. The boundary data and title matters as shown hereon have been developed from the referenced title report.  
 2. This survey does not contain sufficient details for design purposes.  
 3. This survey does not include easements except those specifically delineated hereon, nor does it show the location of or encroachments by subsurface footings and/or foundations of buildings shown on this map.  
 4. If underground public utilities and other subsurface structures, zones, set back and street widening data are shown hereon, it is for information only, having been obtained from a general request at the local agency's public utility and/or other sources not contracted with this company. No representation is made as to the accuracy, currency or completeness of said information due to changes conditions not reflected in the standard research performed for this project. Any users of said information are urged to contact the utility company of local agency directly.



**LIST OF ENCUMBRANCES :**

THE FOLLOWING ITEMS WERE FOUND IN TITLE REPORT NO. 10-725134213-A-DJ PREPARED BY FIDELITY NATIONAL TITLE COMPANY, DATED NOVEMBER 8, 2010:

- PROPERTY TAXES
- PROPERTY TAXES
- PROPERTY TAXES
- PROPERTY TAXES
- PROPERTY TAXES
- THE LIEN SUPPLEMENTAL TAXES
- WATER RIGHTS, CLAIMS OR TITLE TO WATER
- AN EASEMENT (AS PLOTTED) REC. SEPT. 29, 1967 IN BK. 8389, PG. 413 O.R.
- AN EASEMENT (AS PLOTTED) REC. OCT. 25, 1967 IN BK. 8415, PG. 708 O.R.
- AN EASEMENT (AS PLOTTED) REC. SEPT. 17, 1981 IN BK. 14223, PG. 3 O.R.
- AN EASEMENT (AS PLOTTED) REC. APRIL 2, 1985 AS INST. NO. 85-116054 O.R.
- COVENANTS, CONDITIONS AND RESTRICTIONS
- MATTERS CONTAINED IN THAT CERTAIN DOCUMENT A DEED OF TRUST
- AN ASSIGNMENT
- THE FACT
- MATTERS WHICH MAY BE DISCLOSED
- ANY EASEMENTS
- ANY RIGHTS OF THE PARTIES IN POSSESSION
- TITLE COMPANY REQUIREMENTS
- TITLE COMPANY REQUIREMENTS

**LEGAL DESCRIPTION:** (PER TITLE REPORT)

THE LAND REFERRED TO HEREIN BELOW IS SITUATED IN THE CITY OF SANTA ANA, COUNTY OF ORANGE, STATE OF CALIFORNIA, AND IS DESCRIBED AS FOLLOWS:

**PARCEL A:**

PARCELS 1, 2, 5, 6, 8 AND 9, IN THE CITY OF SANTA ANA, COUNTY OF ORANGE, STATE OF CALIFORNIA, AS SHOWN ON A MAP FILED IN BOOK 52, PAGE 33 OF "PARCEL MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

**PARCEL B:**

NON-EXCLUSIVE EASEMENTS FOR INSTALLATION AND MAINTENANCE OF ELECTRIC, TELEPHONE, WATER, GAS, SANITARY SEWER LINES AND DRAINAGE FACILITIES; INSPECTION AND MAINTENANCE; AND ENCROACHMENTS ALL AS MORE PARTICULARLY DESCRIBED IN THE "DECLARATION OF COVENANTS, CONDITIONS, RESTRICTIONS AND RESERVATION FOR EASEMENTS FOR RITCHEY CENTRE", RECORDED AUGUST 23, 1985 AS INSTRUMENT NO. 85-317869 AND MODIFIED BY MODIFICATION RECORDED AUGUST 21, 2000 AS INSTRUMENT NO. 20000436442, BOTH OF OFFICIAL RECORDS.

APN: 403-041-01, 403-041-02, 403-041-09, 403-041-10, 403-042-02, 403-042-01

**FLOOD NOTE:**

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE "X" OF THE FLOOD INSURANCE RATE MAP, COMMUNITY PANEL NO. 060232, PANEL 0038FC, WHICH BEARS AN EFFECTIVE DATE OF 06-14-2000 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA.

**ENGINEER'S CERTIFICATION :**

I AM A REGISTERED PUBLIC ENGINEER IN THE STATE OF CALIFORNIA AND I HEREBY CERTIFY TO RITCHEY ASSOCIATES, LLC, A CALIFORNIA LIMITED LIABILITY COMPANY, FIDELITY NATIONAL TITLE COMPANY AND TO JACKSON NATIONAL LIFE INSURANCE COMPANY AND TO ANY OF THEIR AFFILIATES, SUCCESSORS AND ASSIGNS, THAT I UNDERSTAND THAT THE AFOREMENTIONED TITLE INSURER WILL RELY ON THE ACCURACY AND COMPLETENESS OF THE SURVEY PLAT AND THE TRUTH OF MY CERTIFICATIONS IN INSURING A POLICY OF TITLE INSURANCE ASSURING THE VALIDITY AND PRIORITY OF THE LIEN OF A MORTGAGE OR DEED OF TRUST ON THE PREMISES AND LENDER WILL SO RELY IN DETERMINING WHETHER TO FUND THE RELATED LOAN. THIS SURVEY IS MADE IN ACCORDANCE WITH THE "MINIMUM STANDARD REQUIREMENTS FOR ALTA/ACSM LAND TITLE SURVEY" JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS IN 2005; AND INCLUDES ITEMS 2, 3, 4, 6, 7(b)(1), 8, 9, 10, 11(a) AND 14 OF TABLE A THEREOF, PURSUANT TO THE ACCURACY STANDARDS AS ADOPTED BY ALTA AND NSPS AND IN EFFECT ON THE DATE OF THIS CERTIFICATION. UNDERSIGNED FURTHER CERTIFIES THAT IN MY PROFESSIONAL OPINION, AS A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA, THE RELATIVE POSITIONAL ACCURACY OF THIS SURVEY DOES NOT EXCEED THAT WHICH IS SPECIFIED IN THE CURRENT ACCURACY STANDARDS FOR ALTA/ACSM LAND TITLE SURVEYS.



DAVID J. MAC ARTHUR, R.C.E. 12502 DATE 12-16-2011

**NATIONAL ENGINEERING & CONSULTING, INC.**  
 87 ORCHARD LANE  
 LAKE FOREST, CA 92650  
 TEL: (949) 716-9970  
 FAX: (949) 716-9970

**Voluntary Seismic Strengthening**  
 AN INDUSTRIAL BLDG. RETROFIT  
 1918 E. GLENWOOD BLDG. D  
 SANTA ANA CA. 92705

JOB NO. R-Vol-001-D

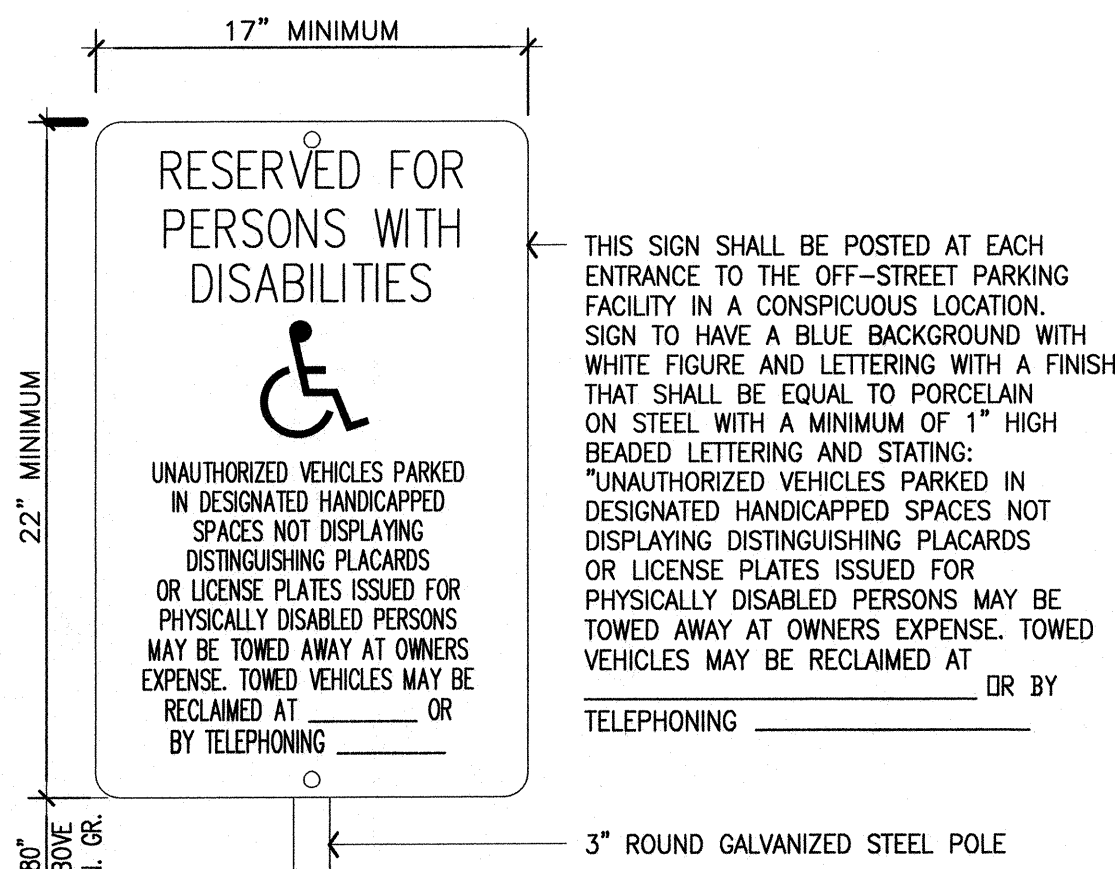
**REVISION:**

10/11/11	CITY SUBMITTAL
12/05/11	RE-SUBMITTAL

**FOR REFERENCE ONLY**

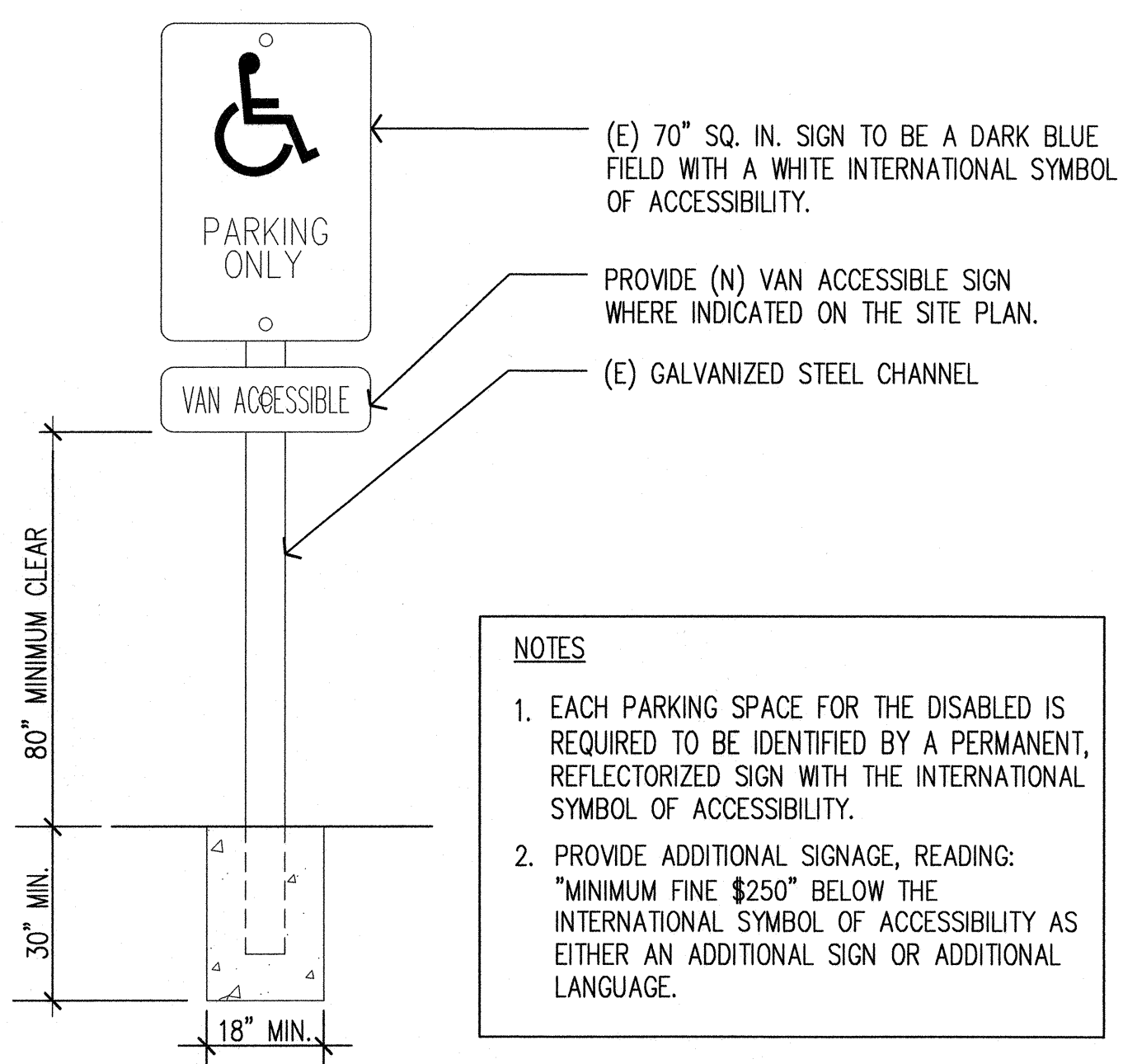
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**ALTA SURVEY**

**SHEET NUMBER:**  
**T-2**



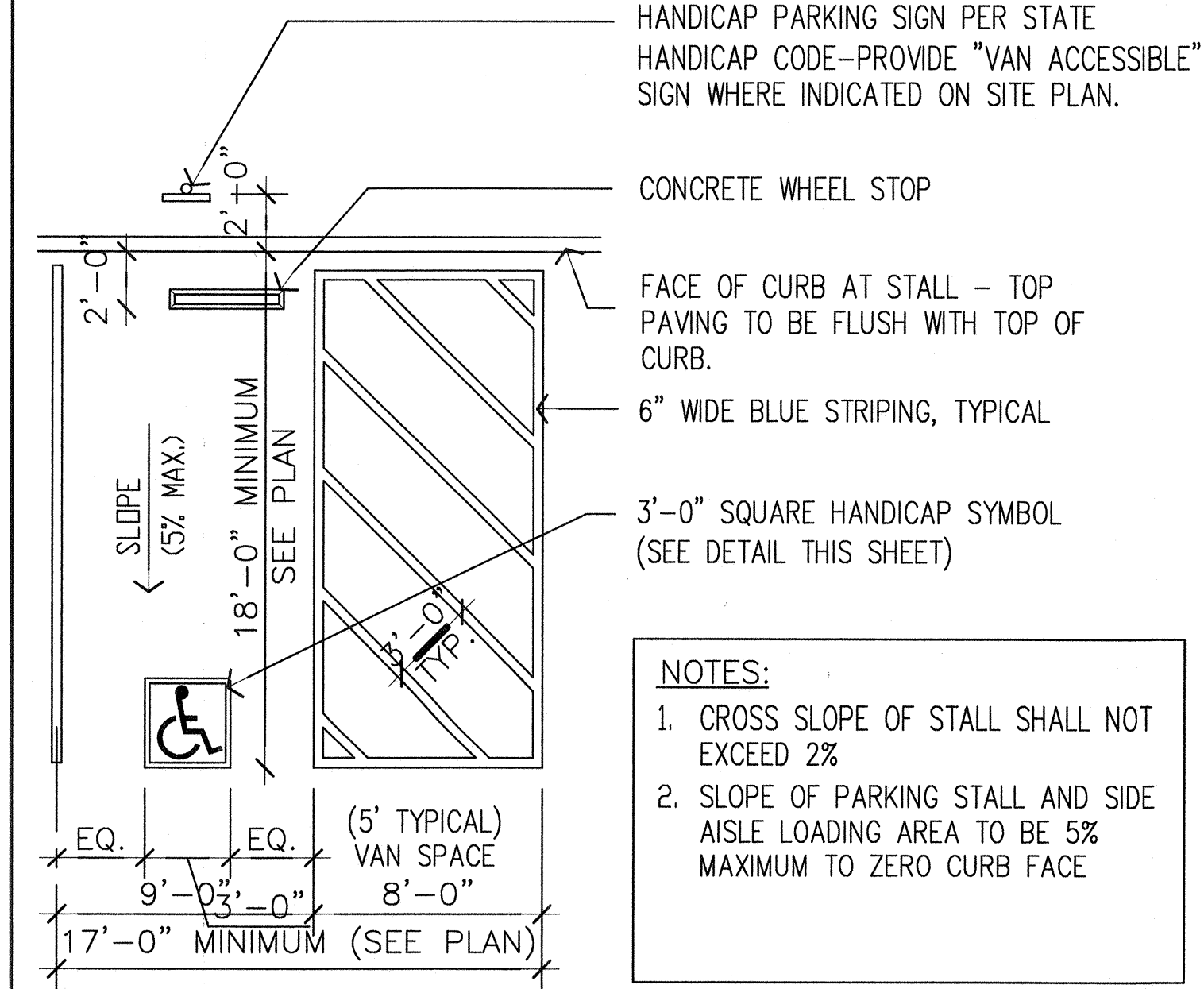
**PARKING ENTRANCE SIGN**

SCALE: 8



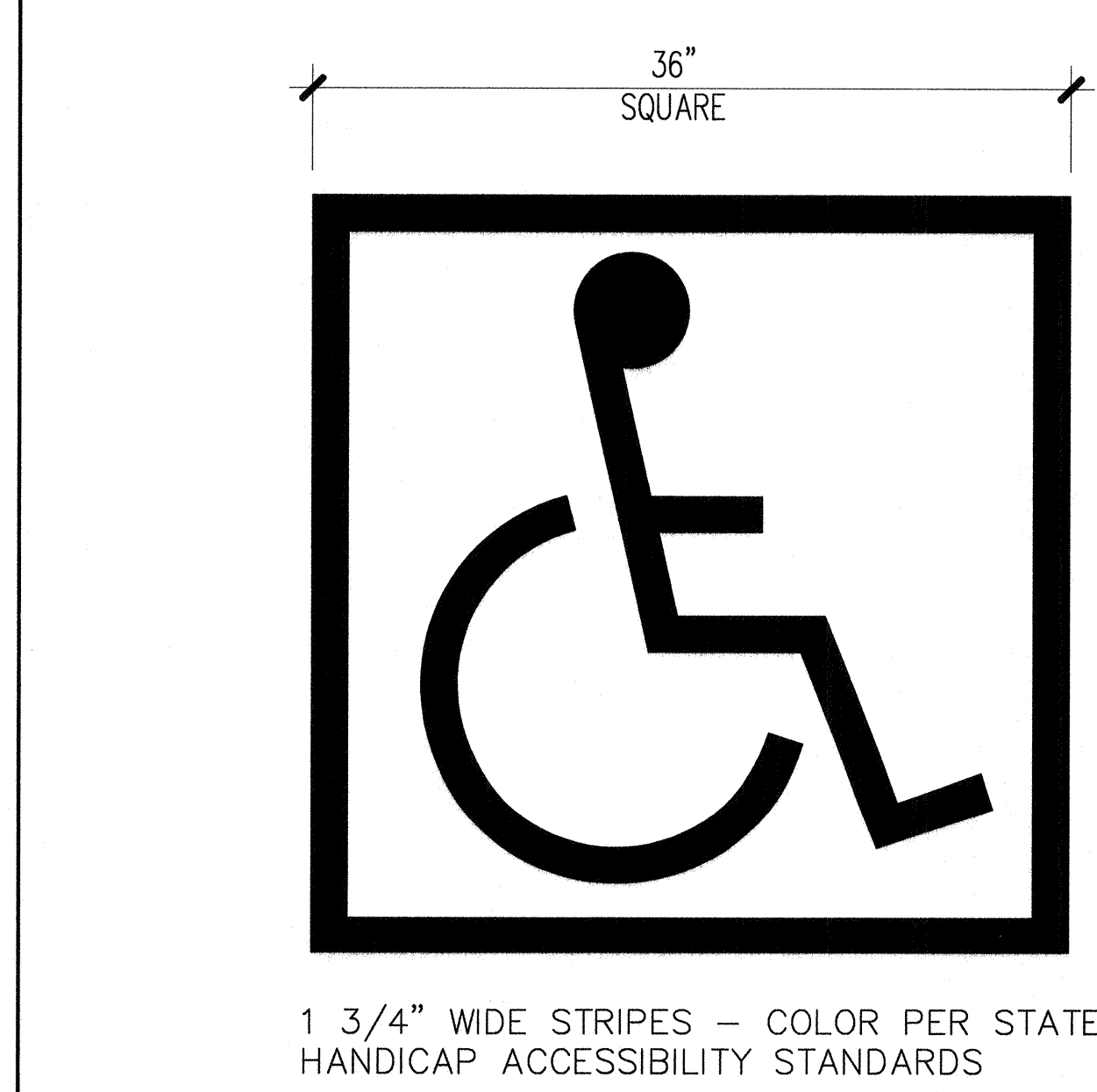
**ACCESSIBLE SIGNAGE**

SCALE: N.T.S.



**ACCESSIBLE PARKING (TYP.)**

SCALE: N.T.S.

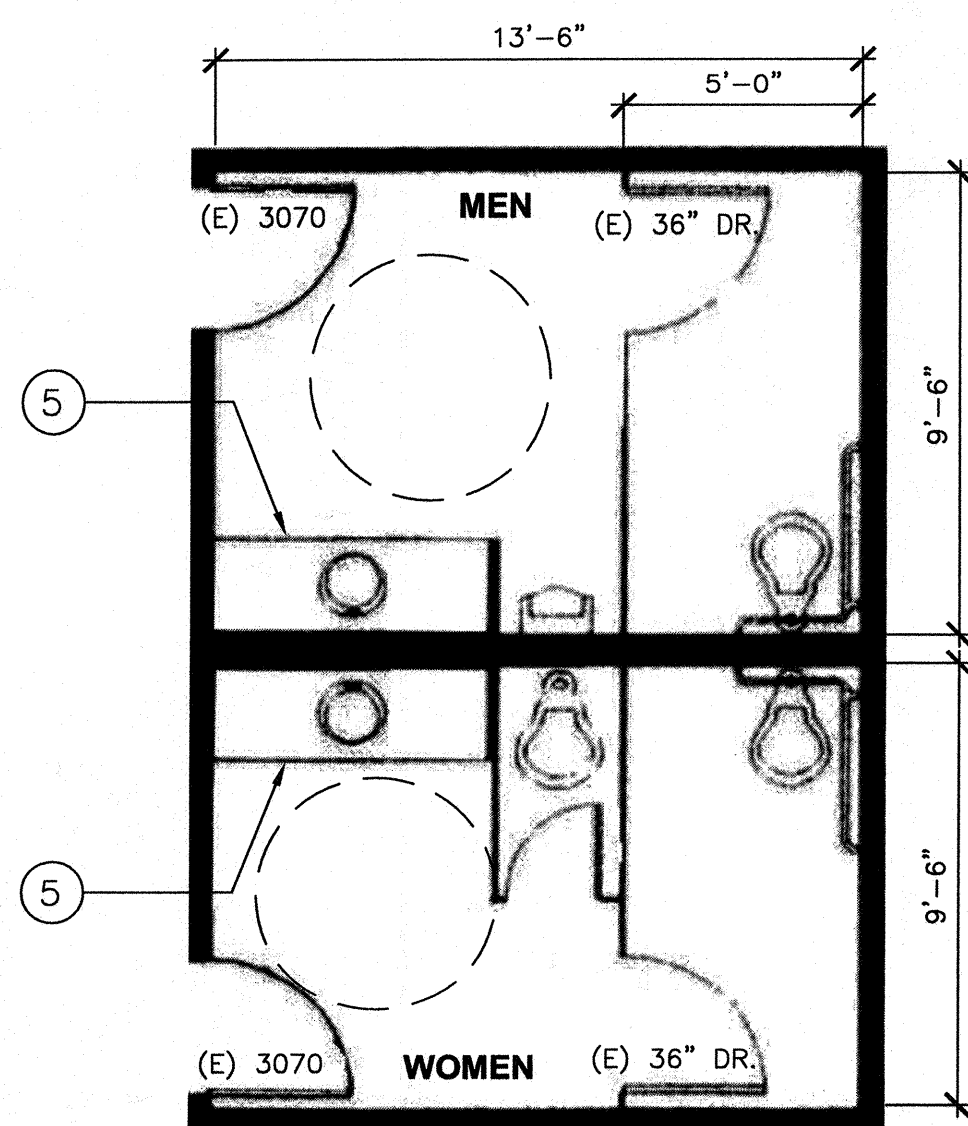


**SYMBOL OF ACCESSIBILITY**

SCALE: N.T.S.

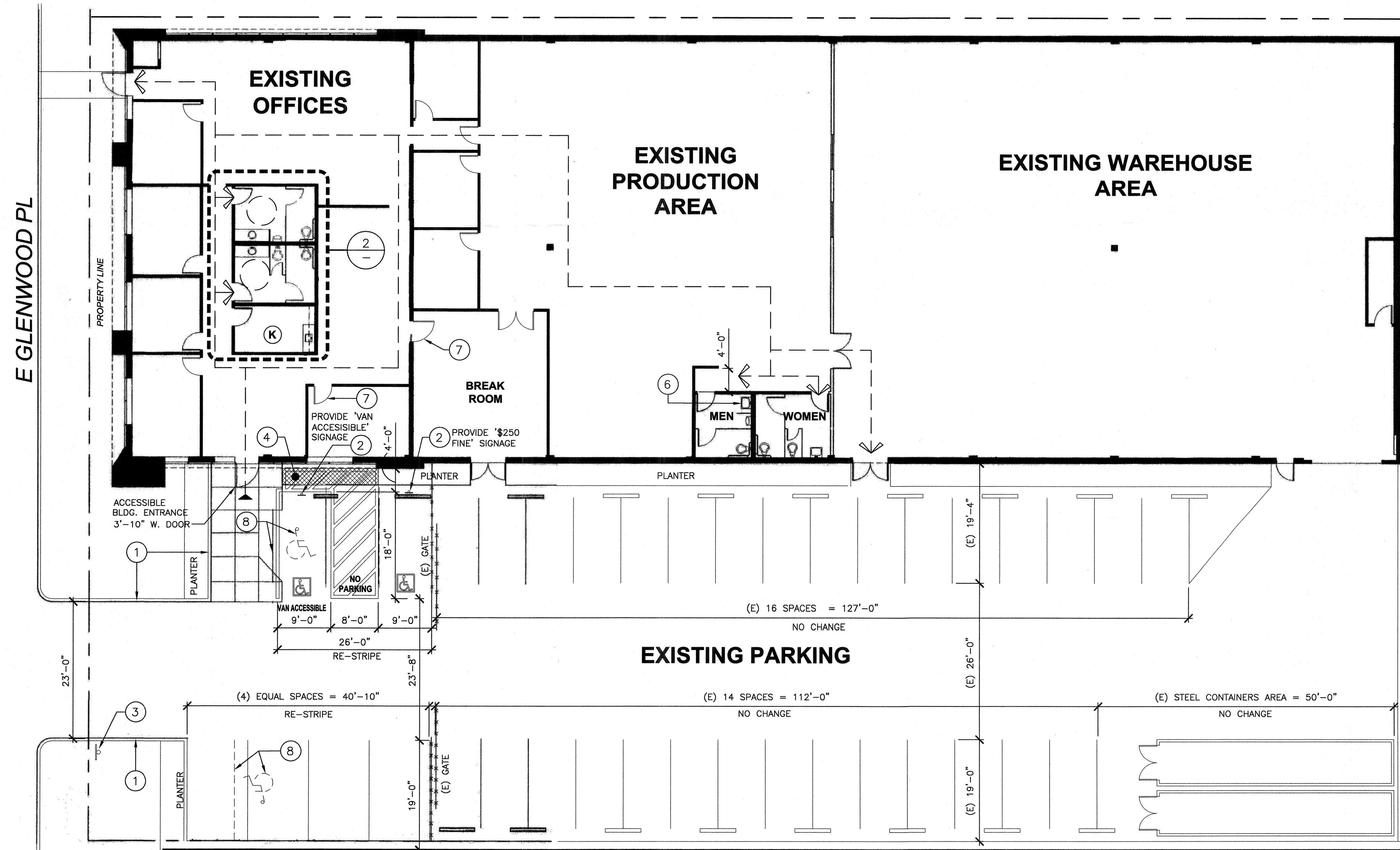
- 1 (E) CONCRETE CURB
- 2 PROVIDE (N) ADA SIGNAGE AT THIS LOCATION, PER DETAIL.
- 3 PROVIDE (N) ADA SIGNAGE AT MAIN PARKING ENTRANCE
- 4 REMOVE (E) PLANTING AS NEEDED, CAP (E) SPRINKLER LINES, AND APPLY 2.5" THK ASPHALT TO MATCH GRADE WITH NO MORE THAN 2% SLOPE.
- 5 EXISTING LAVATORY COUNTERTOPS TO BE LOWERED FROM 37" A.F.F. TO 34" A.F.F. MIRROR ALSO TO BE LOWERED. PATCH & REPAIR WALL AS REQ'D.
- 6 EXISTING SINK WITH CABINET TO BE REMOVED. REPLACE WITH ACCESSIBLE SINK.
- 7 REPLACE (E) NON-COMPLIANT DOORKNOBS INDICATED ON PLAN WITH "LEVER-TYPE" HARDWARE TO MATCH BUILDING STANDARD.
- 8 REMOVE (E) H.C. STRIPING & SYMBOLS.

**KEYNOTES**



**EXISTING RESTROOMS**

SCALE: 1/4"=1'-0" 2



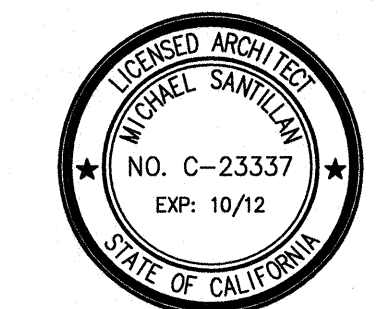
**ENLARGED OFFICE AREA / FLOOR PLAN**

SCALE: 3/32"=1'-0" 1

**Voluntary Seismic Strengthening**  
 AN INDUSTRIAL BLDG. RETROFIT  
 1918 E. GLENWOOD BLDG. D  
 SANTA ANA CA. 92705

JOB NO. R-Vol-001-D

REVISION:	
10/11/11	CITY SUBMITTAL
12/05/11	RE-SUBMITTAL
12/15/11	PLN CHK COMM



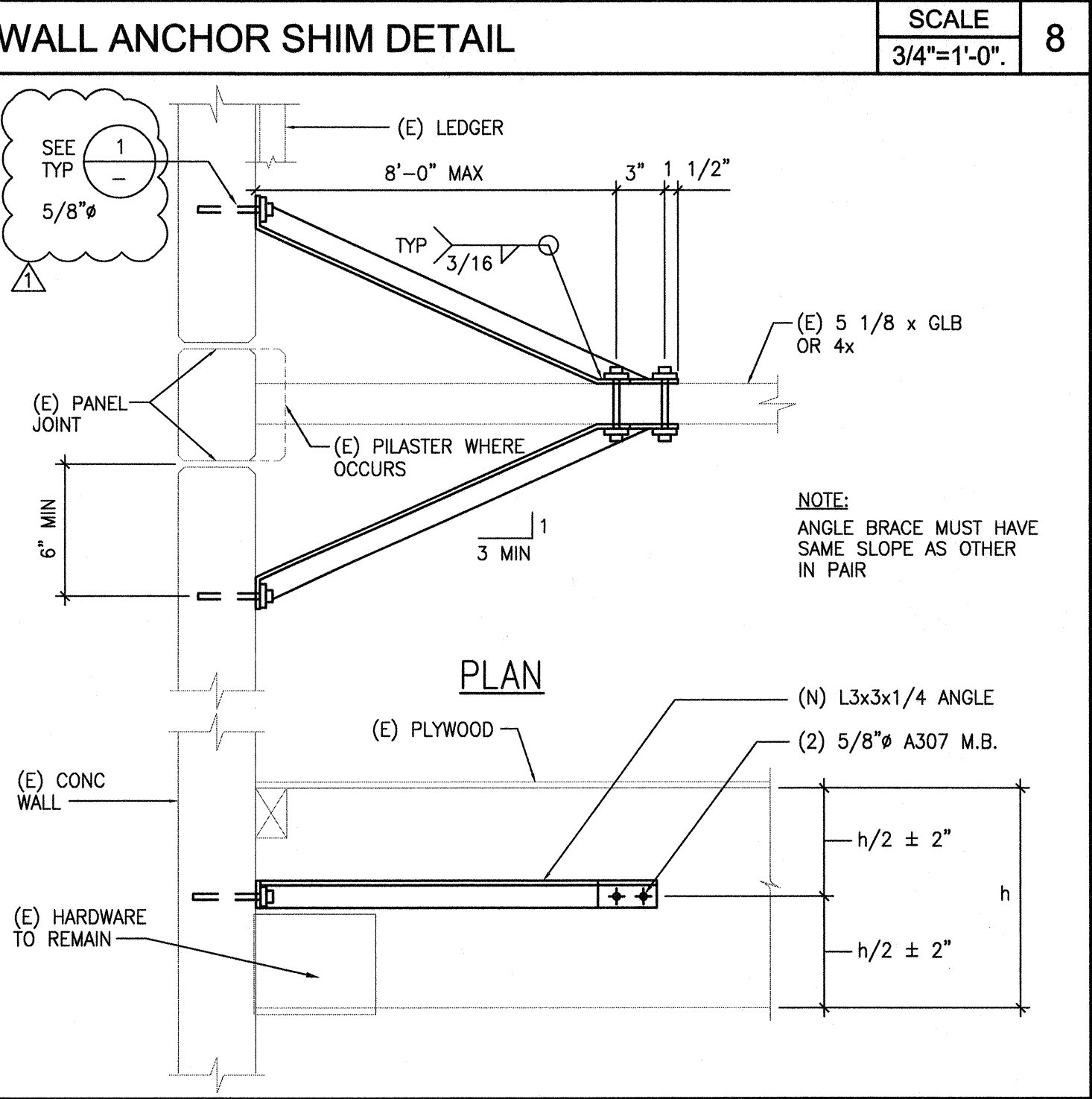
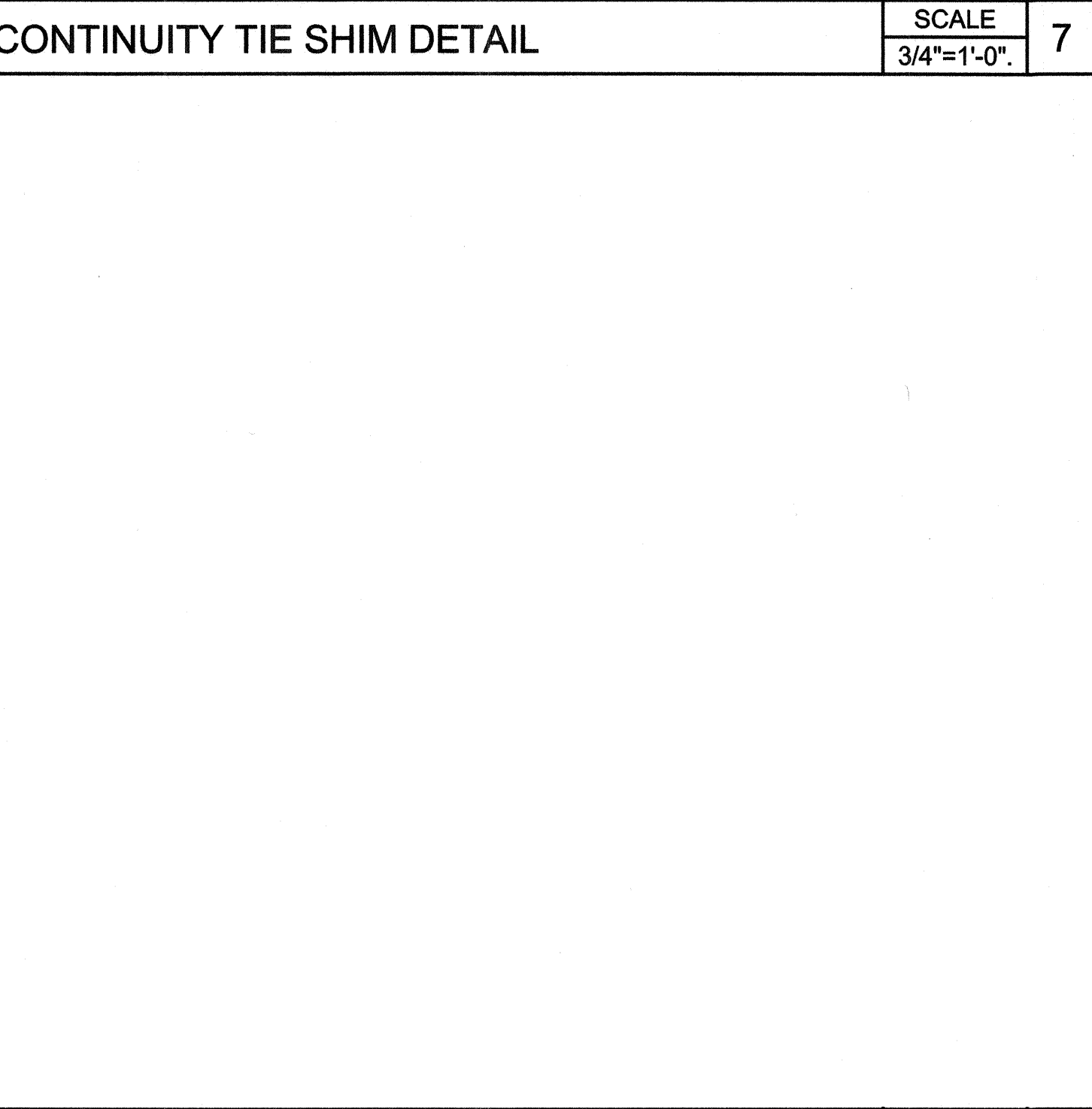
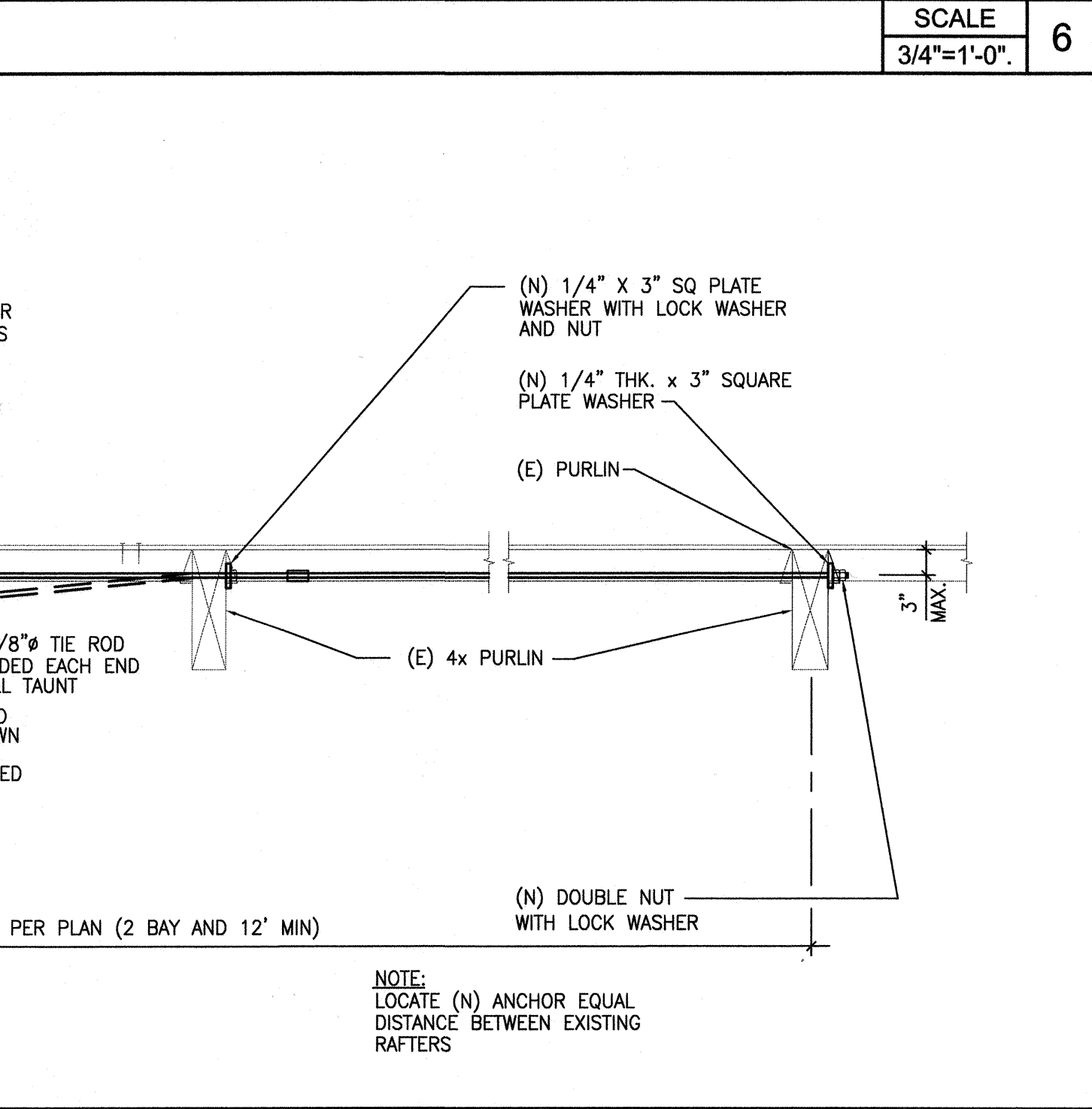
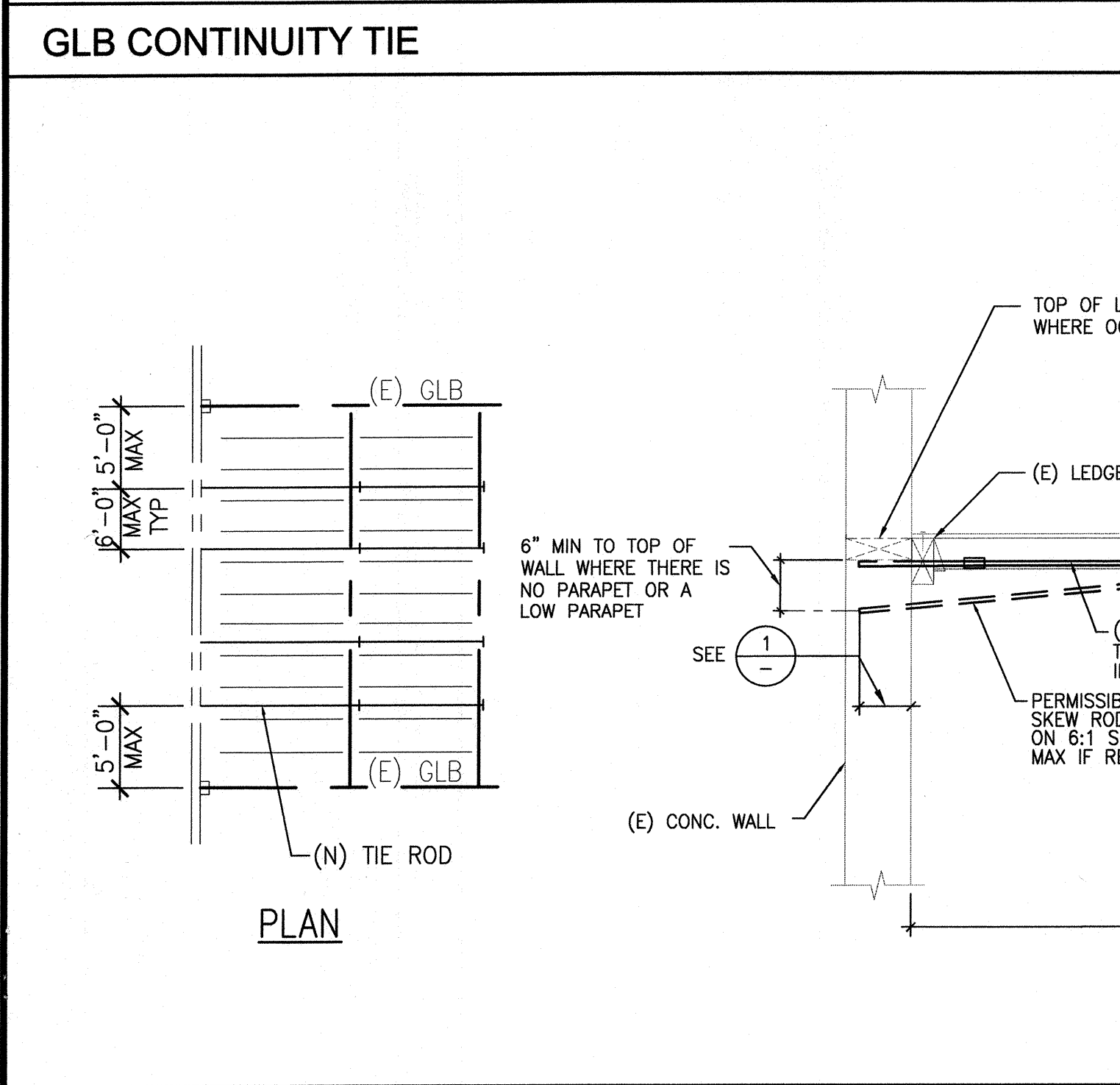
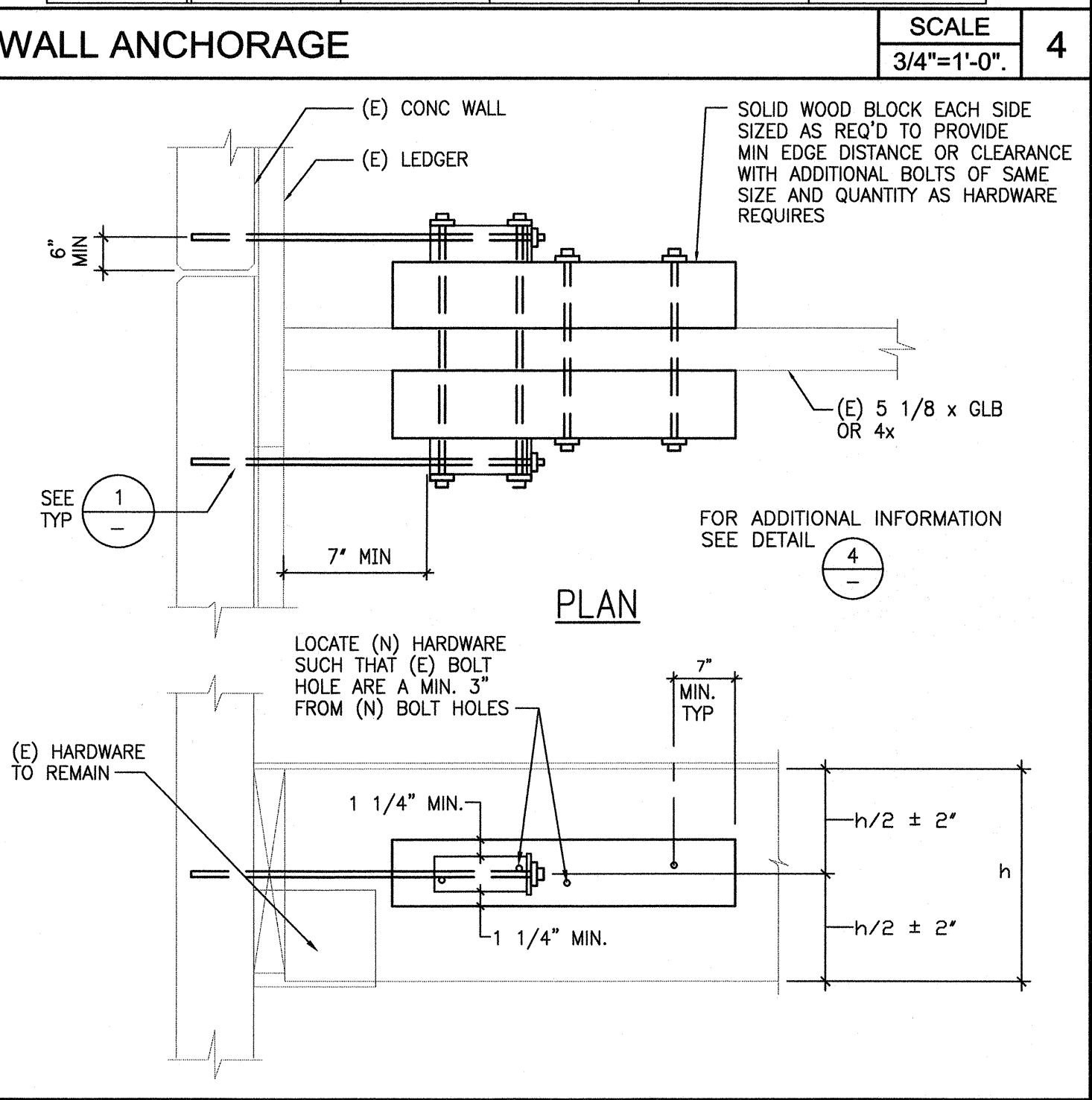
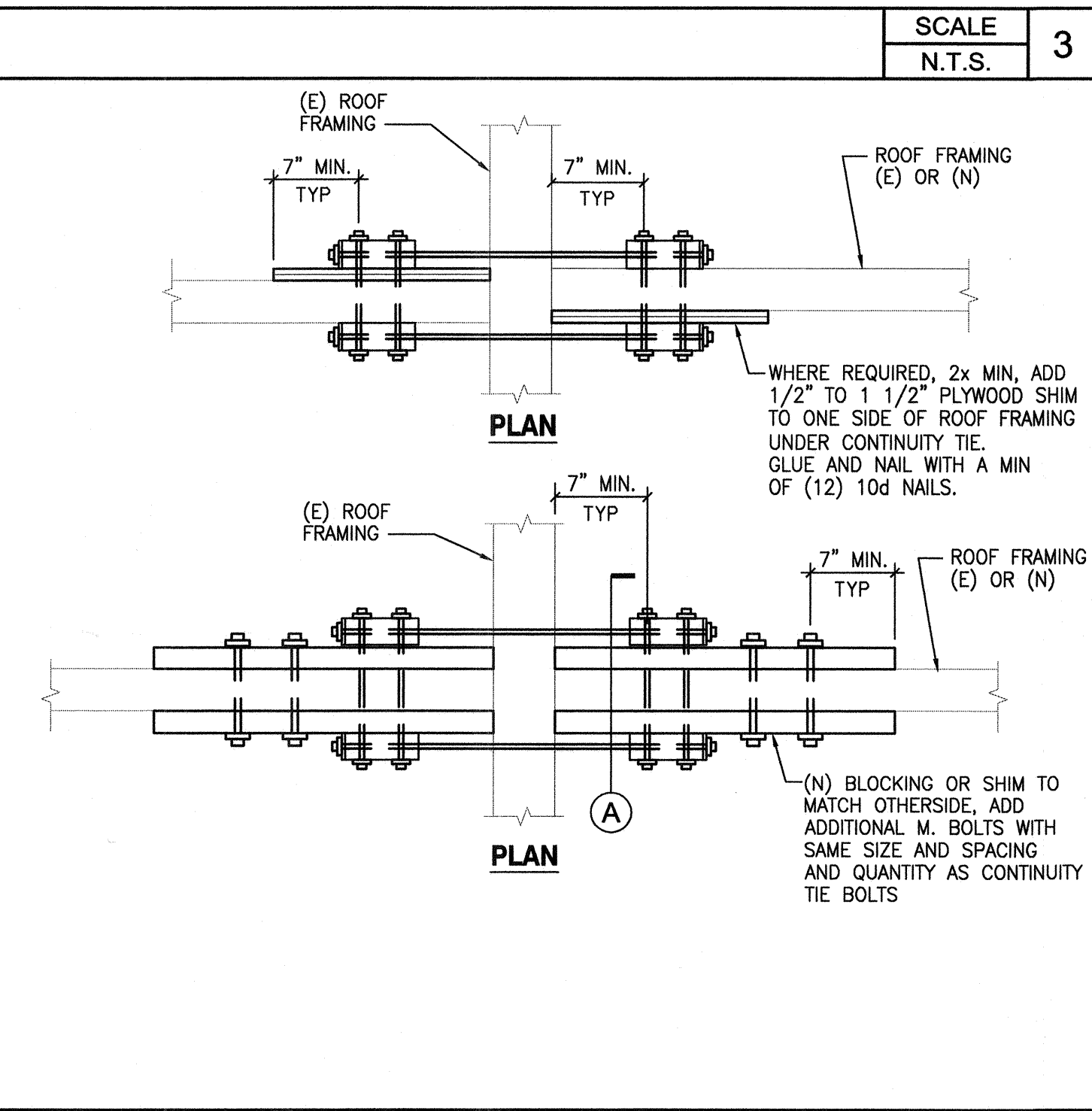
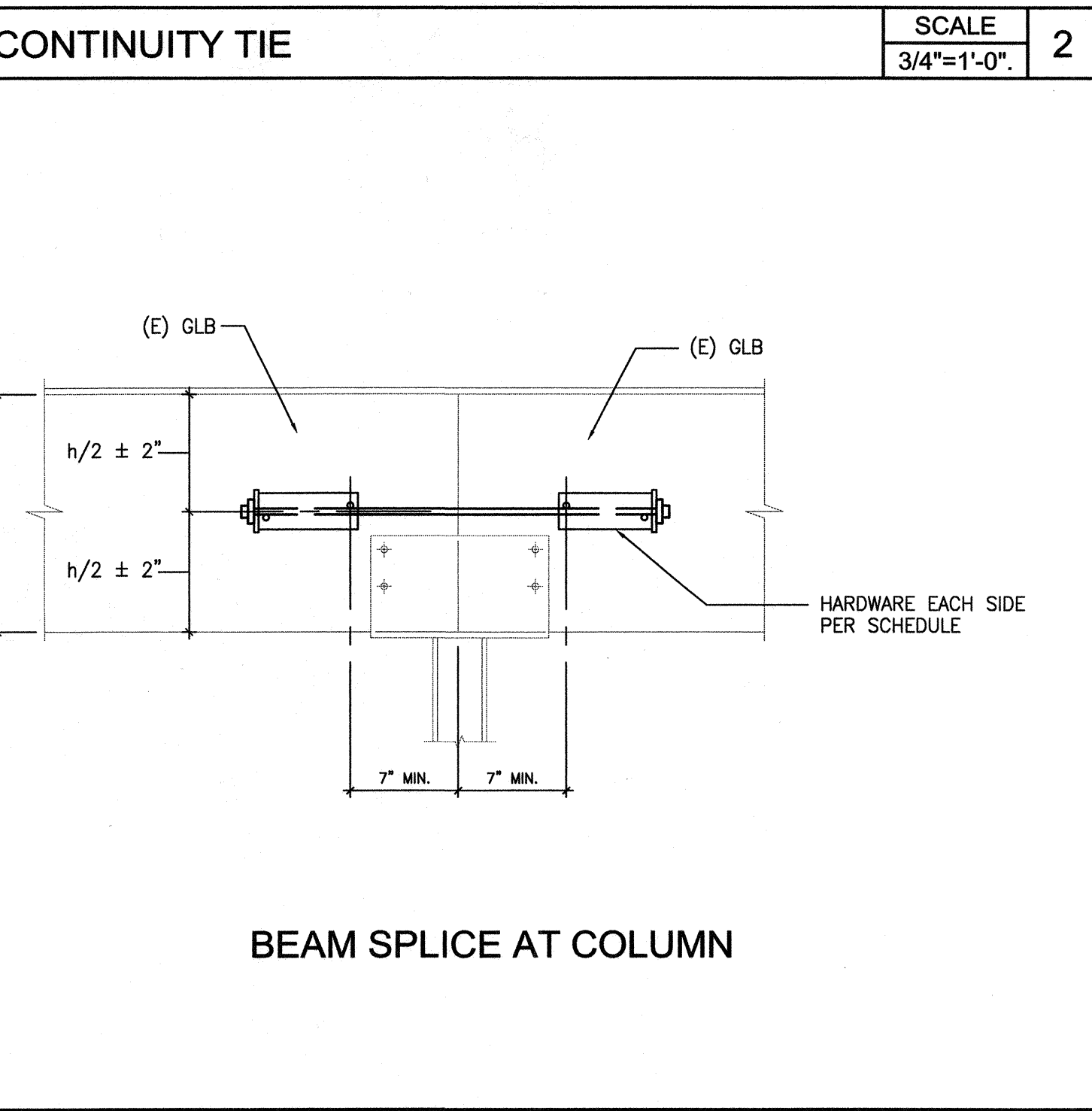
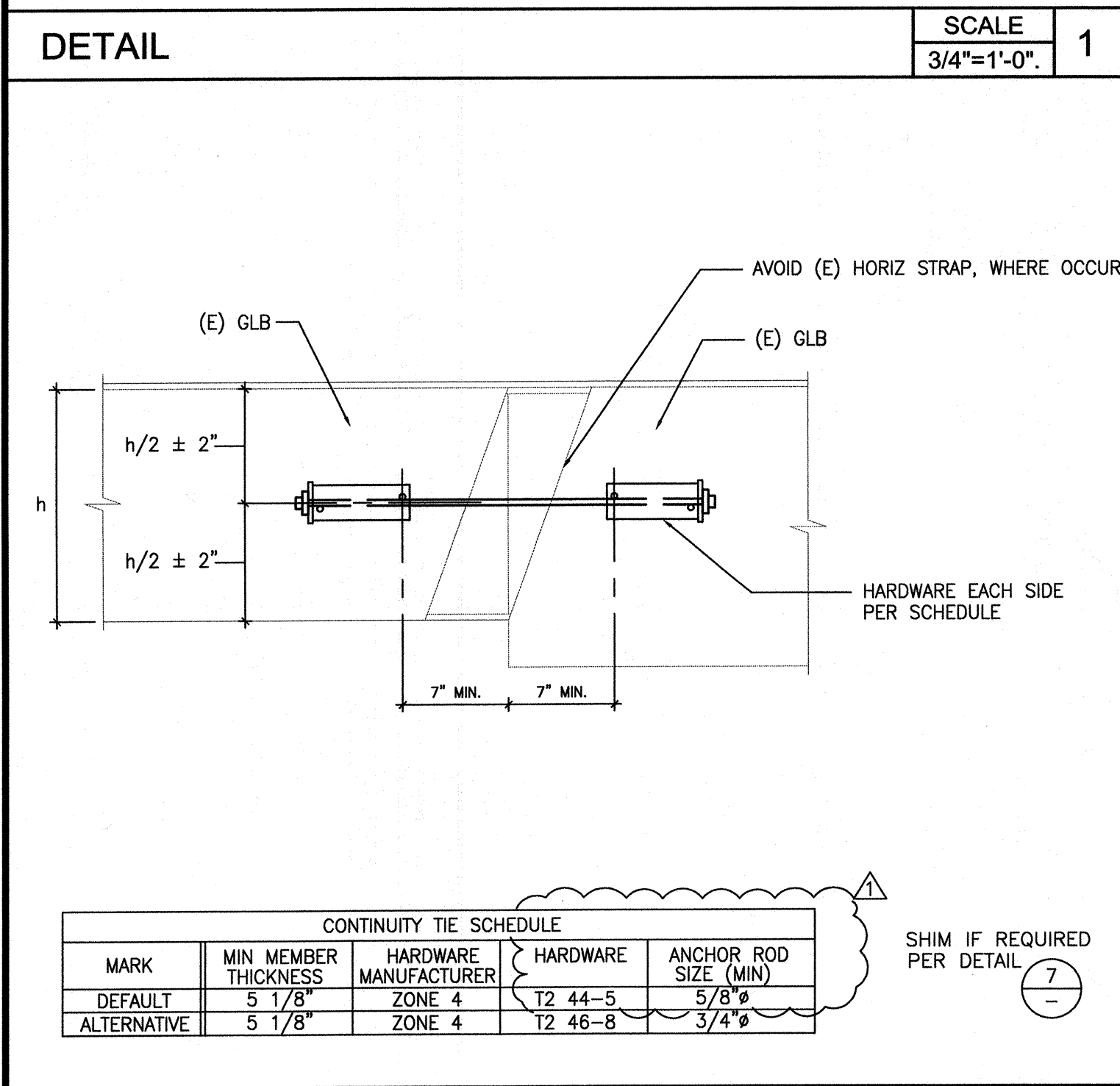
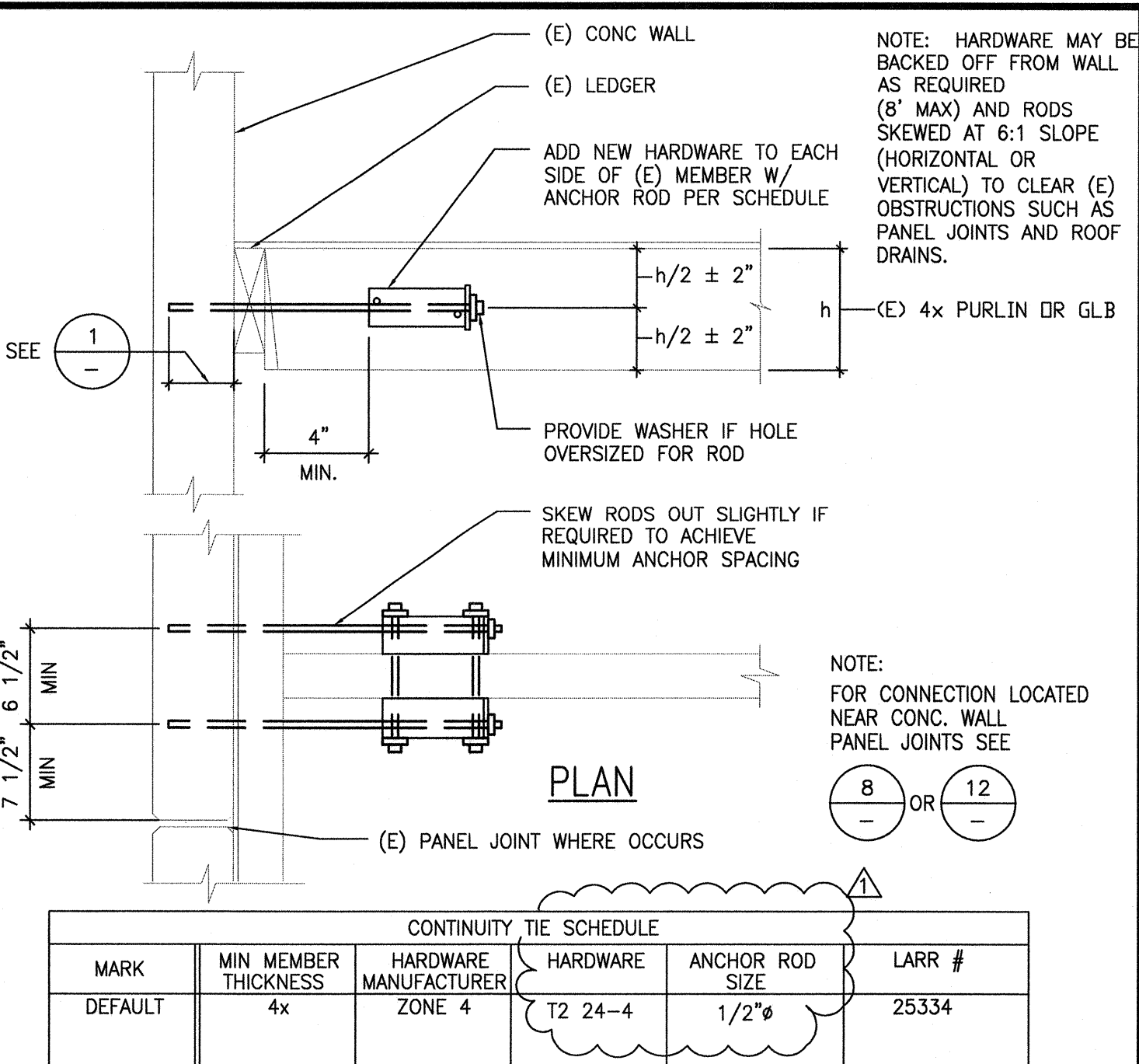
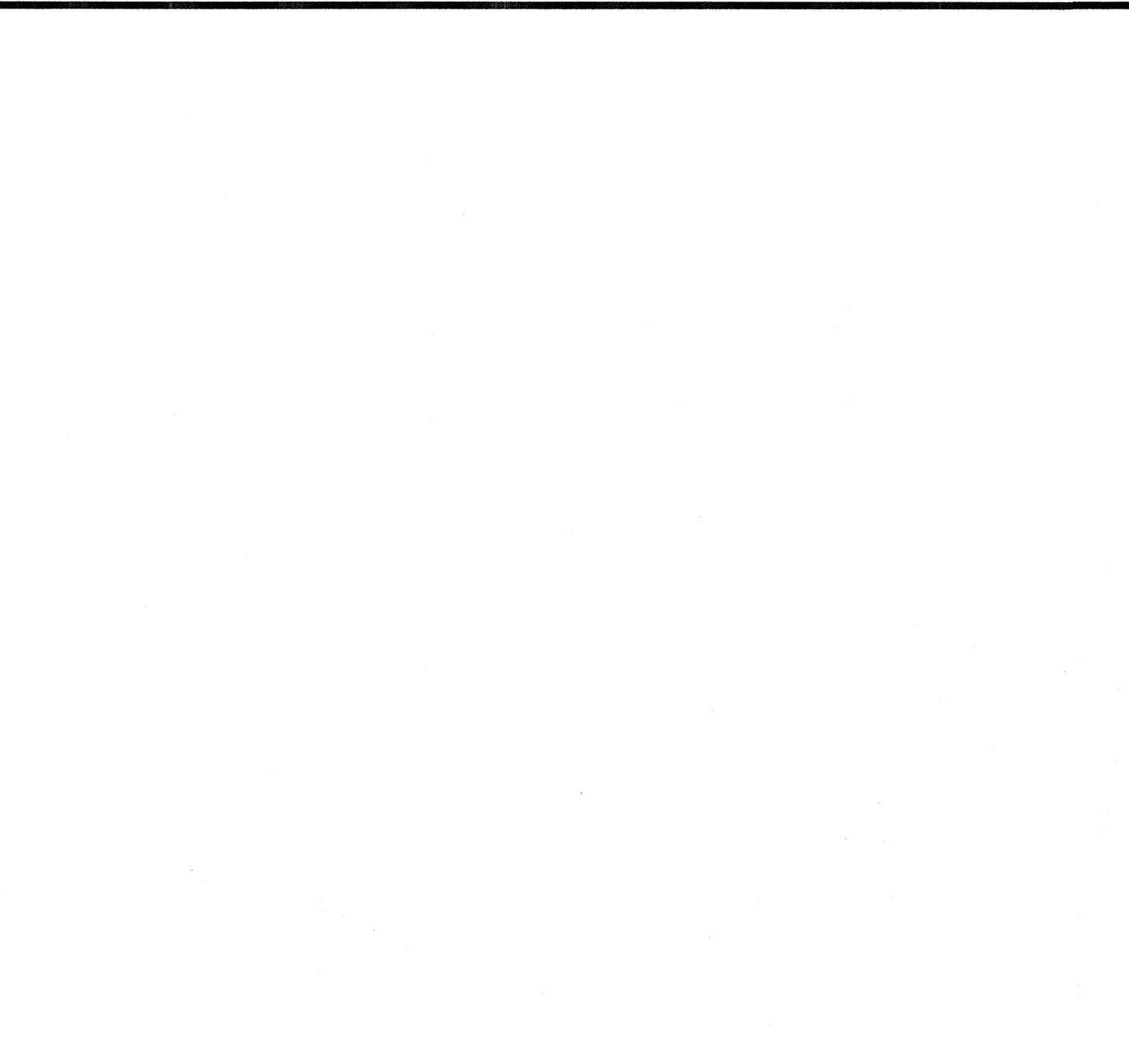
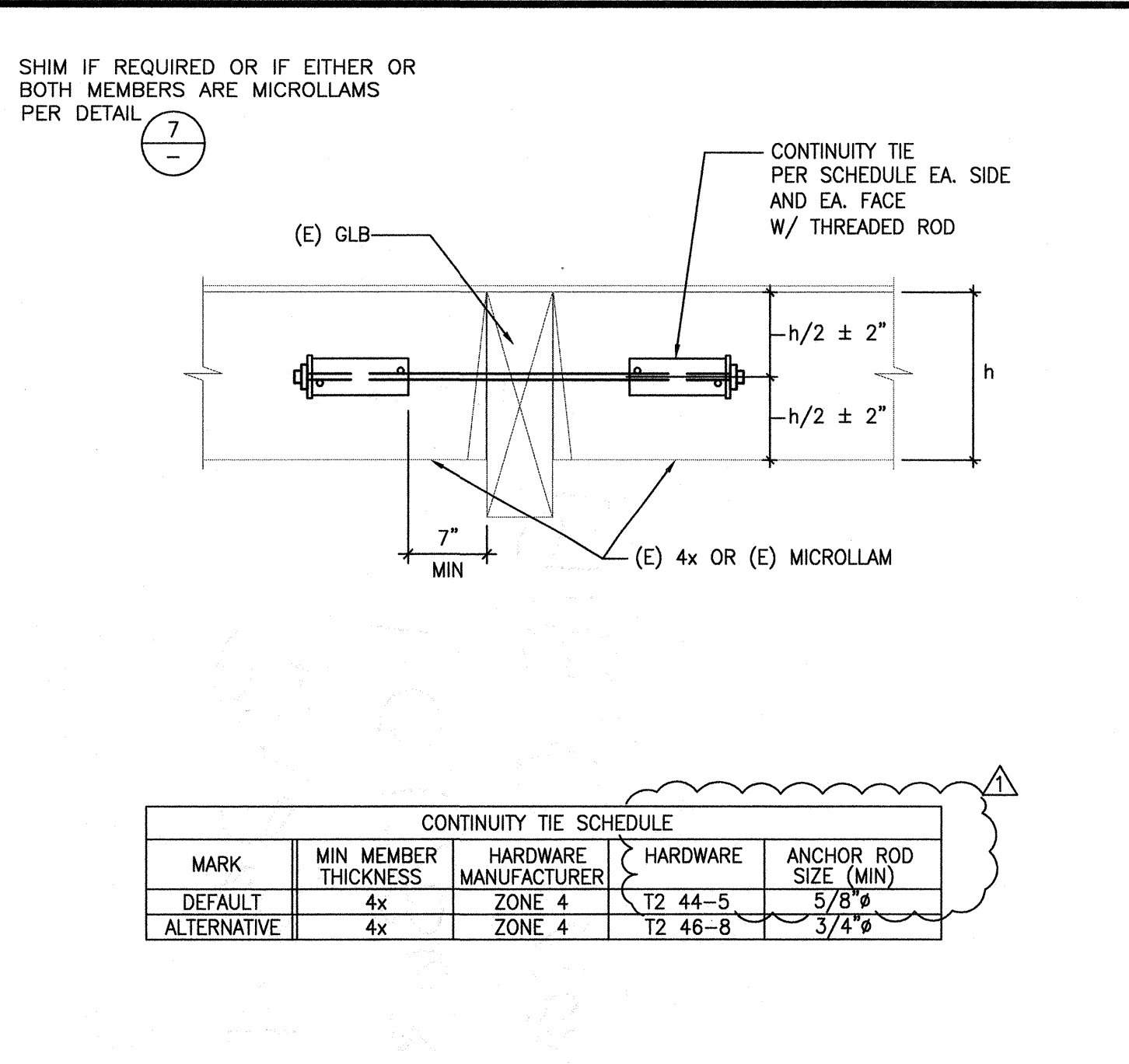
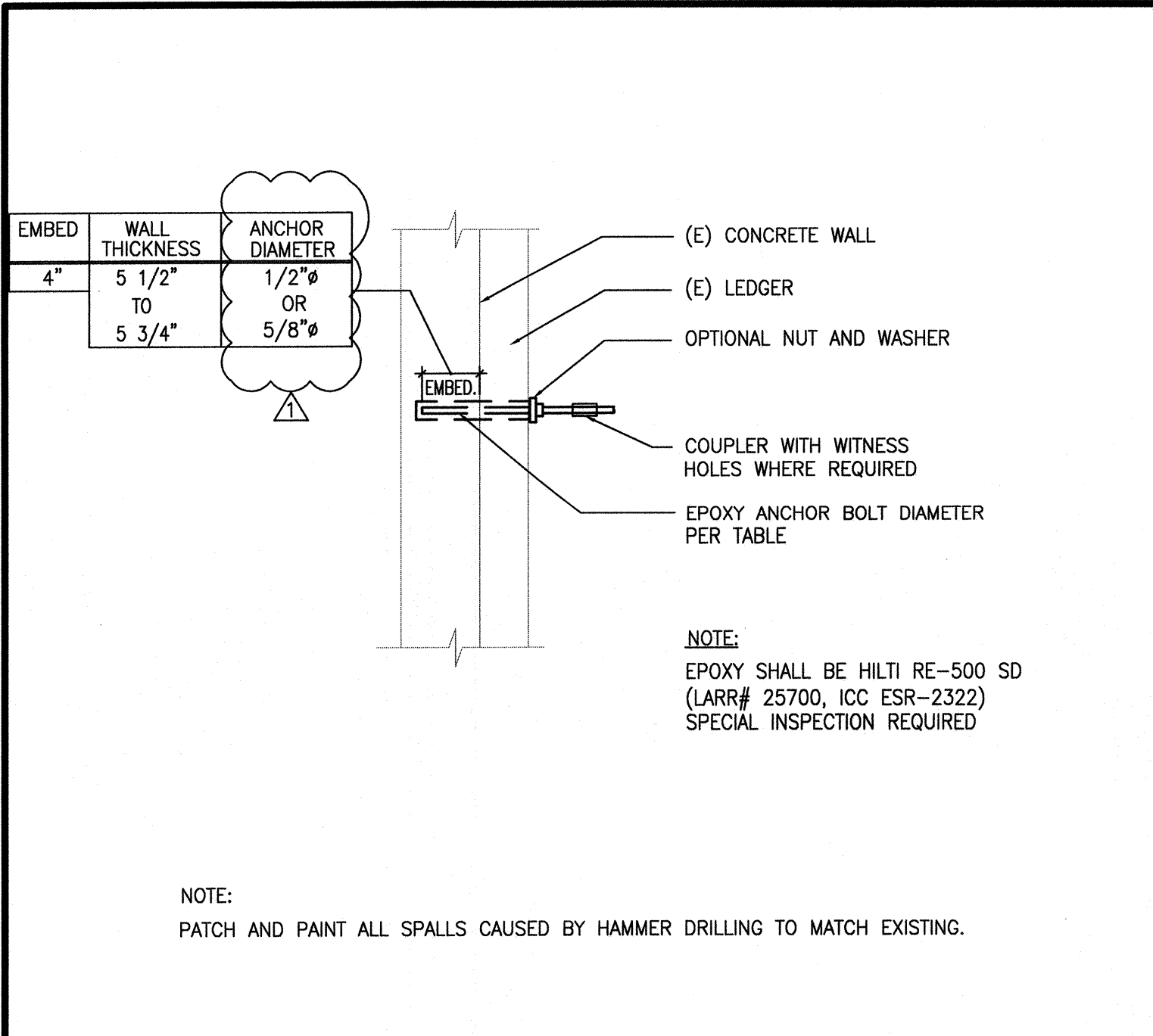
SHEET TITLE:

**ADA UPGRADES PLAN**

SHEET NUMBER:

**A-1**

**NATIONAL**  
 ENGINEERING & CONSULTING, INC.  
 27 FOREST RD. 92690  
 LAKE FOREST, CA  
 PHONE: (949) 716-0990  
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**NATIONAL**  
ENGINEERING & CONSULTING, INC.  
27 ORCHARD  
LAKE FOREST, CA. 92650  
PHONE: (949) 715-9977  
FAX: (949) 715-9977

**Voluntary Seismic Strengthening**  
AN INDUSTRIAL BLDG. RETROFIT  
1918 E. GLENWOOD BLDG. D  
SANTA ANA CA. 92705

JOB NO. R-Voit-001-D

REVISION:

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12/05/11	RE-SUBMITTAL



SHEET TITLE:  
**ROOF FRAMING PLAN**

SHEET NUMBER:  
**SD-1**

**Voluntary Seismic Strengthening**  
AN INDUSTRIAL BLDG. RETROFIT  
1918 E. GLENWOOD BLDG. D  
SANTA ANA CA. 92705

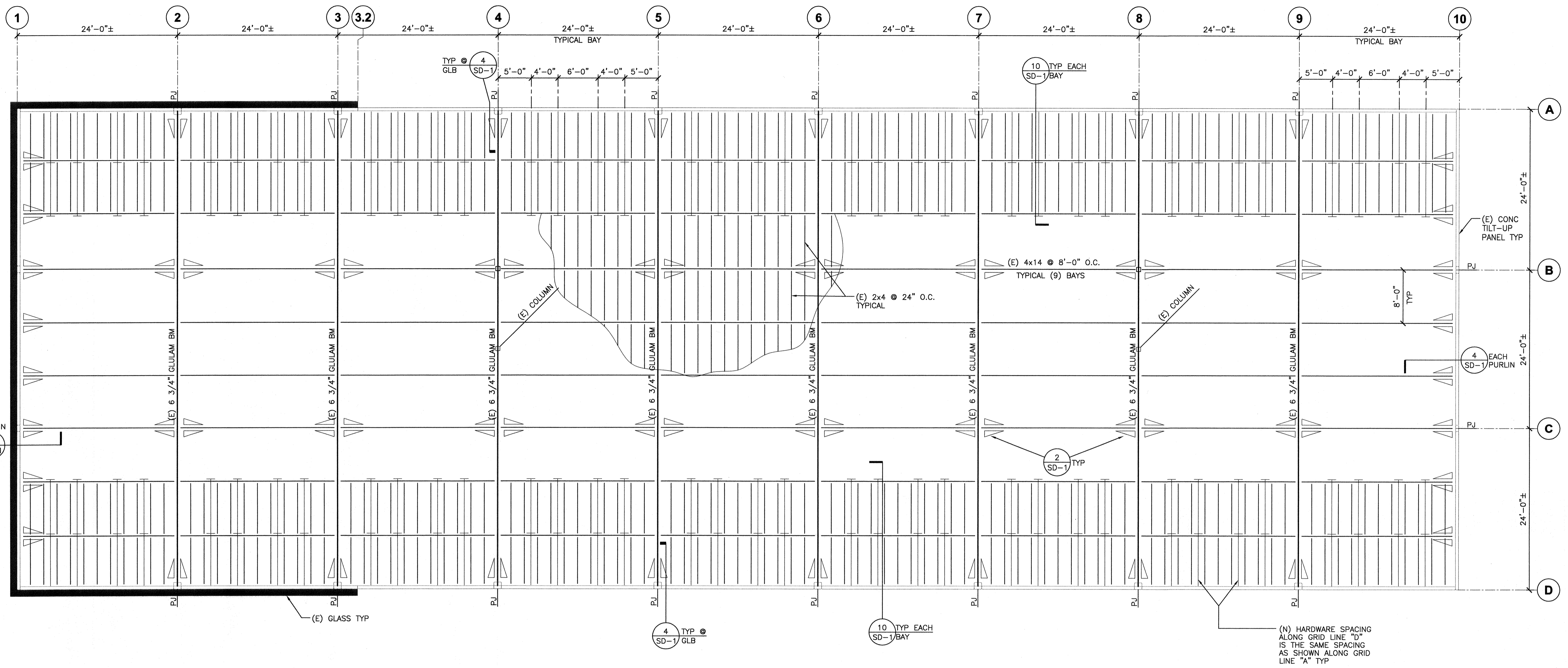
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REVISION:	
10/11/11	CITY SUBMITTAL
12/05/11	RE-SUBMITTAL



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**ROOF FRAMING PLAN**

SHEET NUMBER:  
**S-1**

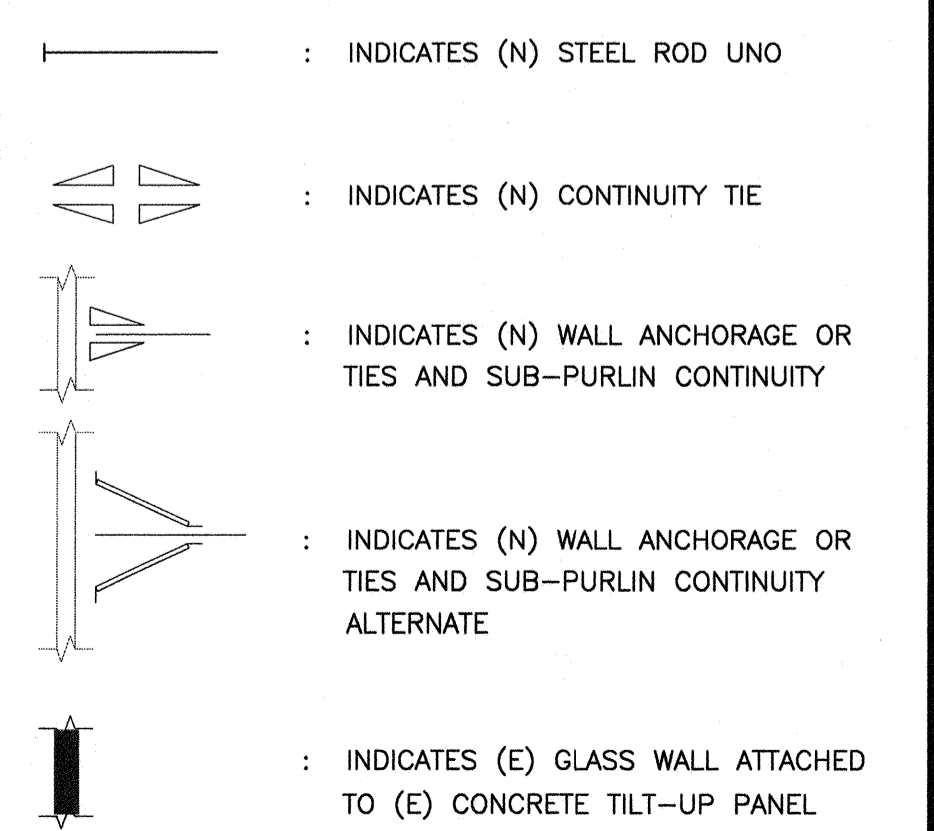


NOTE:  
IF ANY GLB IS SPLICED, PROVIDE (6) SD-1

**ROOF FRAMING NOTES**

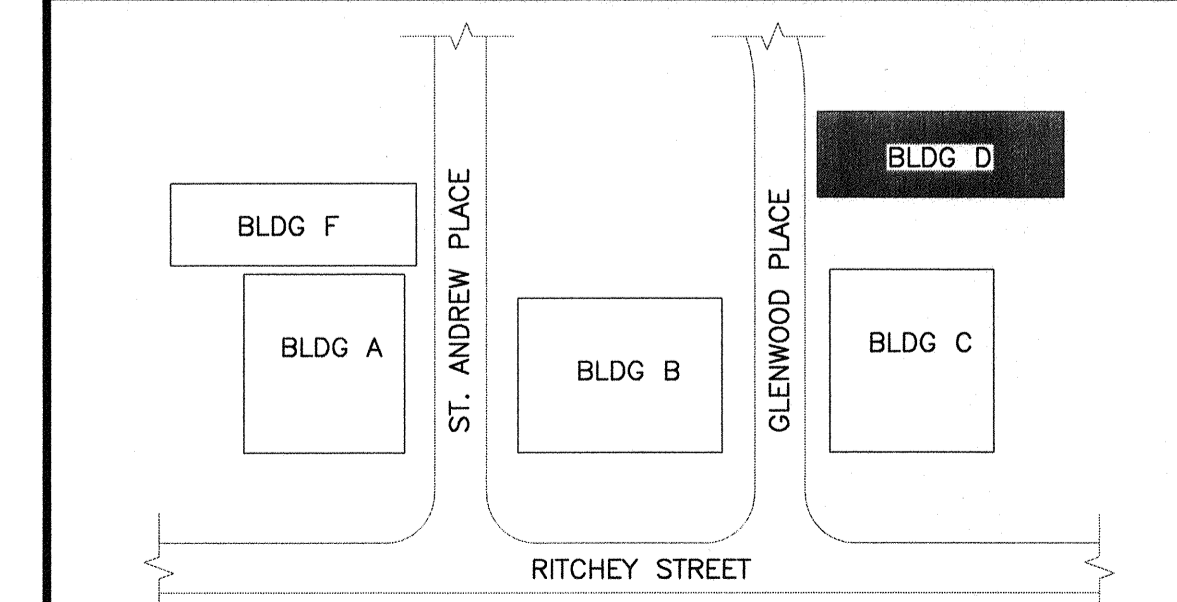
- CONTRACTORS RESPONSIBLE FOR THE CONSTRUCTION OF A WIND OR SEISMIC FORCE RESISTING SYSTEM/COMPONENT LISTED IN THE "STATEMENT OF SPECIAL INSPECTION" SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE LADBS INSPECTORS AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON SUCH SYSTEM OR COMPONENT PER SEC 1706.1
- CONTINUOUS SPECIAL INSPECTION BY A REGISTERED DEPUTY INSPECTOR IS REQUIRED FOR FIELD WELDING, CONCRETE STRENGTH  $f'c > 2500$  PSI, HIGH STRENGTH BOLTING, SPRAYED ON FIREPROOFING, ENGINEERED MASONRY, HIGH LIFT GROUTING, PRE-STRESSED CONCRETE, HIGH LOAD DIAPHRAGMS AND EPOXY ANCHORS.
- IF ADVERSE SOIL CONDITIONS ARE ENCOUNTERED, A SOILS INVESTIGATION REPORT MAY BE REQUIRED.

**LEGEND**



WALLS	(E) WALL THICKNESS	TOP OF PARAPET ELEVATION	TOP OF ROOF ELEVATION
<ul style="list-style-type: none"> <li>GRID 10</li> <li>GRID A, FROM 3.2 TO 10</li> <li>GRID D, FROM 3.2 TO 10</li> </ul>	5-1/2"	± 17'-0"	VARIES BETWEEN 15'-8" AND 17'-0"
<ul style="list-style-type: none"> <li>GRID 1</li> <li>GRID A, FROM 1 TO 3.2</li> <li>GRID D, FROM 1 TO 3.2</li> </ul>	5-1/2"	± 17'-4" (GLASS TO 18'-6")	VARIES BETWEEN 15'-8" AND 17'-0"

**KEY PLAN**



SCALE:  
1/8" = 1'-0" **1**

STRUCTURAL STEEL

- 1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 13TH EDITION OF THE AISC MANUAL OF STEEL CONSTRUCTION...
2. STRUCTURAL STEEL SHOP DRAWINGS SHALL BE REVIEWED BY THE ENGINEER/ARCHITECT PRIOR TO FABRICATION.
3. GROUTING OF COLUMN BASE PLATES: BASE PLATES SHALL BE DRYPACKED OR GROUTED WITH NON-FERRUGINOUS GROUT. MINIMUM COMPRESSIVE STRENGTH SHALL BE 4,000 PSI AT 28 DAYS.

FRAMING

- 1. ALL LUMBER SHALL BE GRADE MARKED DOUGLAS FIR-LARCH AND SHALL HAVE THE FOLLOWING MINIMUM GRADES:
JOISTS AND RAFTERS #1
BEAMS AND STRINGERS #1
PLATES #2
STUDS (2x4, 3x4, 2x6) #1
POSTS, COLUMNS AND TIMBER #1
2. ALL FRAMING EXPOSED TO THE WEATHER OR IN CONTACT WITH MASONRY OR CONCRETE SHALL BE PRESSURE-TREATED IN ACCORDANCE WITH THE AMERICAN WOOD PRESERVERS ASSOCIATION SPECIFICATIONS.

FRAMING CONTINUED.....

- 17. LAG BOLTS SHALL HAVE LEAD HOLES BORED AS FOLLOWS: SHANK PORTION SAME DIAMETER AND LENGTH AS SHANK THREADED PORTION 0.6-0.75 OF DIAMETER OF THREAD
18. ALL EXISTING WOOD MATERIALS WHICH WILL BE A PART OF THE STRENGTHENING WORK SHALL BE IN GOOD CONDITION AND FREE FROM DEFECTS WHICH SUBSTANTIALLY REDUCE THE CAPACITY OF THE MEMBER.

EPOXY AND EXPANSION ANCHORS

- 1. EPOXY OR EXPANSION ANCHORS SHALL NOT BE USED EXCEPT WHERE SPECIFICALLY SHOWN ON THE PLANS OR WHEN APPROVED IN ADVANCE BY THE STRUCTURAL ENGINEER.
2. DRILLED HOLES SHALL BE PREPARED AND ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE CURRENT ICC REPORT.
3. SPECIAL INSPECTION SHALL BE PROVIDED IN ACCORDANCE WITH BUILDING CODE AND IN THE SPECIFIC SPECIAL INSPECTION REQUIREMENTS SET FORTH IN THE CURRENT ICC REPORT.

- 8. ANCHORS SHALL BE INSTALLED WITH THE PLATE WASHER INSTALLED BETWEEN THE NUT AND SILL PLATE. THE NUT SHALL BE TIGHTENED TO A SNUG-TIGHT CONDITION AFTER CURING IS COMPLETE FOR ADHESIVE ANCHORS AND AFTER EXPANSION WEDGE ENGAGEMENT FOR EXPANSION ANCHORS. THE INSTALLATION OF NUTS ON ALL ANCHORS SHALL BE SUBJECT TO VERIFICATION BY THE SUPERINTENDENT OF BUILDING. TORQUE TESTING SHALL BE PERFORMED FOR 25% OF ALL ADHESIVE OR EXPANSION ANCHORS. MINIMUM TEST VALUES SHALL BE 30 FOOT-POUNDS FOR 1/2-INCH AND 40 FOOT-POUNDS FOR 5/8-INCH DIAMETER ANCHORS.

STATEMENT OF SPECIAL INSPECTIONS PER THE 2009 IBC / 2010 CBC

- 1. THE OWNER OR REGISTERED DESIGN PROFESSIONAL OF RECORD WILL EMPLOY THE SERVICES OF ONE OR MORE SPECIAL INSPECTORS TO PROVIDE SPECIAL INSPECTIONS DURING CONSTRUCTION FOR THE ITEMS IN THE SPECIAL INSPECTION TABLE BELOW.
2. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL AND THE REGISTERED DESIGN PROFESSIONAL RESPONSIBLE FOR THE DESIGN OF THE STRUCTURE, FOR INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.
3. DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:
A. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED FOR CONFORMANCE WITH THE APPROVED DESIGN DRAWINGS AND SPECIFICATIONS. THE INSPECTOR MAY NOTIFY, MODIFY, ENLARGE OR WAIVE ANY OF THE REQUIREMENTS OF THE DOCUMENTS.
B. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, THE PROFESSIONAL OF RECORD, AND THE CONTRACTOR. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. THEN, IF UNCORRECTED, SUBMIT A COMPLETE LIST OF ALL OUTSTANDING DISCREPANCIES ON A WEEKLY BASIS TO THE OWNER, THE BUILDING OFFICIAL, AND THE PROFESSIONAL OF RECORD UNTIL ALL CORRECTIONS HAVE BEEN COMPLETED.

Table with 3 columns: SPECIAL INSPECTION, FREQUENCY, REFERENCED STANDARD. Row 1: CONCRETE, 1. INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED, CONTINUOUS.

ADDITIONAL SEISMIC RESISTANCE CASES:

Table with 2 columns: SEISMIC DESIGN CATEGORIES REQUIRED IN, THE FOLLOWING IS A SUMMARY OF THE SEISMIC SYSTEMS, SEISMIC COMPONENTS AND SEISMIC-FORCE-RESISTING SYSTEMS. Row 1: C, D, E, F, A. ALL MOMENT FRAMES, BRACED FRAMES, CANTILEVERED COLUMNS, SHEARWALLS, AND THEIR FOUNDATIONS, AND DRAGS, CHORDS, FLOOR AND ROOF DIAPHRAGMS.

GENERAL

- 1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN CONFORMANCE WITH THE 2010 CBC AND ALL OTHER GOVERNING CODES. THESE NOTES SHALL BE CONSIDERED A PART OF THE WRITTEN SPECIFICATIONS.
2. THE CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER OF ANY ERRORS, OMISSIONS, OR DISCREPANCIES AS THEY MAY BE DISCOVERED IN THE PLANS, SPECIFICATIONS, & NOTES PRIOR TO STARTING CONSTRUCTION INCLUDING BUT NOT LIMITED BY DEMOLITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY ERROR, OMISSION, OR INCONSISTENCY AFTER THE START OF CONSTRUCTION WHICH HAS NOT BEEN BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER AND SHALL INCUR ANY EXPENSES TO RECTIFY THE SITUATION. THE METHOD OF CORRECTION SHALL BE APPROVED BY THE ARCHITECT/ENGINEER.
3. PRIOR TO STARTING CONSTRUCTION THE CONTRACTOR HAS THE RESPONSIBILITY TO LOCATE ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, AND TO PROTECT THEM FROM DAMAGE. THE CONTRACTOR OR SUBCONTRACTOR SHALL BEAR THE EXPENSE OF REPAIRING OR REPLACING ANY DAMAGE TO THE UTILITIES CAUSED DURING THE EXECUTION OF THE WORK.

- 5. A COPY OF THE APPROVED PLANS SHALL BE KEPT IN A PLACE SPECIFIED BY THE GOVERNING AGENCY, AND BY LAW SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ALL CONSTRUCTION SETS REFLECT THE SAME INFORMATION AS THE APPROVED PLANS. THE CONTRACTOR SHALL ALSO MAINTAIN ONE SET OF PLANS AT THE SITE FOR THE PURPOSE OF DOCUMENTING ALL AS-BUILT CHANGES, REVISIONS, ADDENDUMS, OR CHANGE ORDERS. THE CONTRACTOR SHALL FORWARD THE AS-BUILT/HIRED DRAWINGS TO THE ARCHITECT/ENGINEER AT THE CONCLUSION OF THE PROJECT.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETE SECURITY OF THE SITE WHILE THE WORK IS IN PROGRESS UNTIL THE JOB IS COMPLETE.
7. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE TEMPORARY POWER, WATER, AND TOILET FACILITIES AS REQUIRED BY THE PROPERTY OWNER OR GOVERNING AGENCY.

- 11. THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF LOAD IMPOSED ON THE STRUCTURAL FRAMING AND STRUCTURE DURING CONSTRUCTION. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED. TEMPORARY SHORING OR BRACING SHALL BE PROVIDED WHERE REQUIRED TO PROTECT SOIL HAS NOT ATTAINED THE DESIGN STRENGTH FOR THE CONDITIONS PRESENT. THE CONTRACTOR SHALL BE RESPONSIBLE TO RECOGNIZE AND CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
12. ALL DIMENSIONS TAKE PRECEDENCE OVER SCALE UNLESS OTHERWISE NOTED.
13. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY FRAMING, BACKING, HANGERS, BLOCKING OR SUPPORTS FOR INSTALLATION OF ITEMS INDICATED ON THE DRAWINGS.

- 18. ALL DEBRIS AND REFUGE IS TO BE REMOVED FROM THE PROJECT. PREMISES SHALL BE LEFT IN A CLEAN BROOM FINISHED CONDITION AT ALL TIMES.
19. ALL SYMBOLS AND ABBREVIATIONS ARE CONSIDERED CONSTRUCTION INDUSTRY STANDARDS. IF A CONTRACTOR HAS A QUESTION REGARDING THEIR EXACT MEANING, THE ARCHITECT/ENGINEER SHALL BE NOTIFIED FOR CLARIFICATIONS.
20. CONTRACTORS SHALL VISIT THE SITE PRIOR TO BID TO ASCERTAIN CONDITIONS WHICH MAY ADVERSELY AFFECT THE WORK OR COST THEREOF.
21. THE CONTRACTOR SHALL FIELD VERIFY THE DIMENSIONS, ELEVATIONS, ETC. NECESSARY FOR THE PROPER CONSTRUCTION AND ALIGNMENT OF THE NEW PORTION OF THE WORK TO THE EXISTING WORK. THE CONTRACTOR SHALL MAKE ALL MEASUREMENTS NECESSARY FOR FABRICATION AND ERECTION OF STRUCTURAL MEMBERS. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT/ ENGINEER.

- 23. NO CHANGES ARE TO BE MADE TO THESE PLANS WITHOUT THE KNOWLEDGE AND WRITTEN CONSENT OF THE ARCHITECT/ ENGINEER. UNAUTHORIZED CHANGES RENDER THESE DRAWINGS VOID. THIS INCLUDES THAT THE CONTRACTOR SHALL NOT BE RELIEVED OF ANY DEVIATION FROM THE PLANS BY THE PROFESSIONAL'S OF RECORD REVIEW OF SHOP DRAWINGS, PRODUCT DATA, ETC. UNLESS THE CONTRACTOR HAS SPECIFICALLY INFORMED THE PROFESSIONAL OF RECORD OF SUCH DEVIATION IN WRITING AT THE TIME OF SUBMISSION AND THE PROFESSIONAL OF RECORD HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
24. ANY REFERENCE TO THE WORDS "APPROVED" OR "APPROVAL" IN THESE DOCUMENTS SHALL BE HERE DEFINED TO MEAN GENERAL ACCEPTANCE OR REVIEW AND SHALL NOT RELIEVE THE CONTRACTOR AND/OR HIS SUB-CONTRACTORS OF ANY LIABILITY IN FURNISHING THE REQUIRED MATERIALS OR LABOR SPECIFIED.
25. RELOCATE ALL ELECTRICAL, PLUMBING AND MECHANICAL ITEMS AND OTHER OBSTRUCTIONS AS REQUIRED.

- 26. THE CONSTRUCTION SHALL NOT RESTRICT A FIVE-FOOT CLEAR AND UNOBSTRUCTED ACCESS TO ANY WATER OR POWER DISTRIBUTION FACILITIES (POWER POLES, PULL-BOXES, TRANSFORMERS, WALLS, PUMPS, VALVES, METERS, APPURTENANCES ETC.) OR TO THE LOCATION OF THE HOOK-UP. THE CONSTRUCTION SHALL NOT BE WITHIN TEN FEET OF ANY POWER LINES-WHETHER OR NOT THE LINES ARE LOCATED ON THE PROPERTY. FAILURE TO COMPLY MAY CAUSE CONSTRUCTION DELAYS AND/OR ADDITIONAL EXPENSES.

DESIGN CRITERIA

2010 CALIFORNIA BUILDING CODE (SECTION 3404.5) AND 2009 INTERNATIONAL EXISTING BUILDING CODE (CHAPTER A2)

- 1. DEAD LOADS
ROOF - N/A
FLOOR - N/A
2. MINIMUM ROOF LIVE LOADS
NOT APPLICABLE - NO NEW ROOF - 20 PSF (REDUCIBLE)
3. SNOW LOADS
NOT APPLICABLE - NO SNOW LOAD
4. WIND LOADS
NOT APPLICABLE - NOT IN SCOPE OF WORK
5. Ss = 1.453
SOIL SITE CLASS D
Sds = 0.968
I = 0.75 (PER IEBC A206.1)
WALL ANCHORAGE Fp = 0.8 Sds I = 0.581

SITE PREPARATION NOTES:

- 1. PRIOR TO STARTING CONSTRUCTION, THE CONTRACTOR SHALL PROTECT ALL AREAS FROM DAMAGE WHICH MAY OCCUR DURING CONSTRUCTION. ANY DAMAGE TO NEW OR EXISTING SURFACES, STRUCTURES OR EQUIPMENT SHALL BE IMMEDIATELY REPAIRED OR REPLACED TO THE SATISFACTION OF THE PROPERTY OWNER. THE CONTRACTOR SHALL BEAR THE EXPENSE OF REPAIRING OR REPLACING ANY DAMAGED AREAS.
2. BEFORE PROCEEDING WITH ANY WORK WITHIN THE EXISTING FACILITY, THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH EXISTING STRUCTURAL AND OTHER CONDITIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL NECESSARY BRACING, SHORING AND OTHER SAFEGUARDS TO MAINTAIN ALL PARTS OF THE EXISTING WORK IN A SAFE CONDITION DURING THE PROCESS OF DEMOLITION AND CONSTRUCTION AND TO PROTECT FROM DAMAGE THOSE PORTIONS OF THE EXISTING WORK WHICH ARE TO REMAIN.

SUBMITTALS

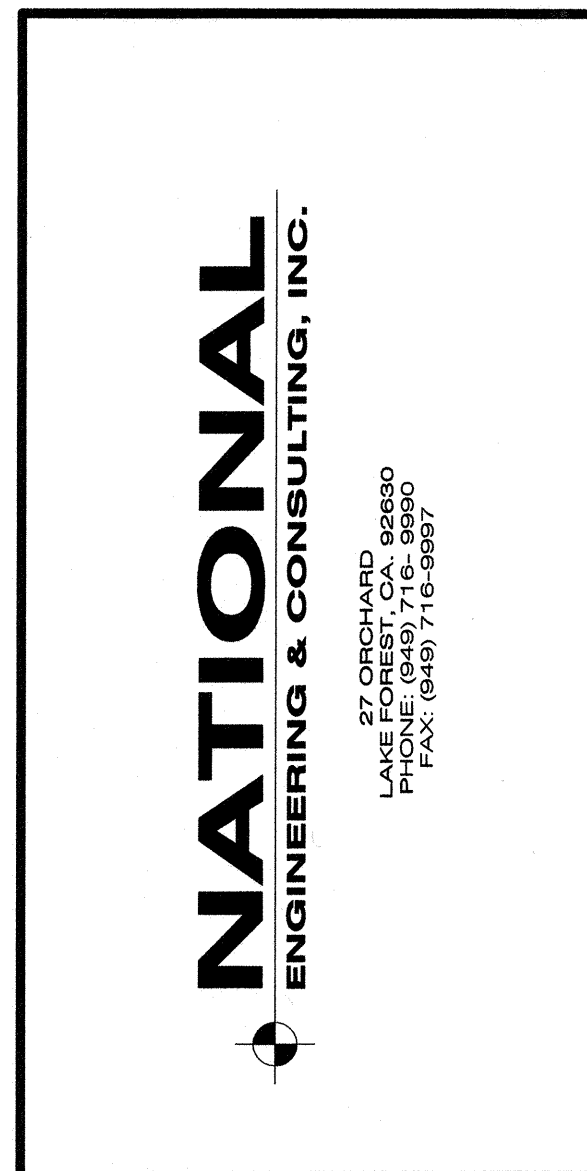
SUBMITTALS: SUBMITTALS FOR SHOP DRAWINGS, MILL TESTS, PRODUCT DATA, ETC. FOR ITEMS DESIGNED BY THE ARCHITECT/ ENGINEER OF RECORD SHALL BE MADE TO THE ARCHITECT/ENGINEER PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REVIEW THE SUBMITTAL BEFORE FORWARDING TO THE ARCHITECT. SUBMITTALS SHALL BE MADE IN TIME TO PROVIDE A TWO-WEEK REVIEW PERIOD FOR THE ARCHITECT/ENGINEER. SUBMITTALS REQUIRED FOR EACH SECTION OF THESE NOTES ARE SPECIFIED IN THAT SECTION.

STRUCTURAL OBSERVATION:

- 1. STRUCTURAL OBSERVATIONS BY AN INDEPENDENT ENGINEER OR THE ENGINEER OF RECORD SHALL BE MADE IN ACCORDANCE WITH SECTION 1709 OF THE CITY OF LOS ANGELES BUILDING CODE AT THE EXPENSE OF THE OWNER TO REVIEW THE CONSTRUCTION OF THE PROJECT. STRUCTURAL OBSERVATION IS THE VISUAL OBSERVATION OF THE ELEMENTS AND CONNECTIONS OF THE STRUCTURAL SYSTEM AT SIGNIFICANT CONSTRUCTION STAGES, AND THE COMPLETED STRUCTURE FOR GENERAL CONFORMANCE TO THE APPROVED PLANS AND SPECIFICATIONS. STRUCTURAL OBSERVATION DOES NOT WAIVE THE RESPONSIBILITY FOR THE INSPECTIONS REQUIRED OF THE BUILDING INSPECTOR OR THE DEPUTY INSPECTOR(S).
2. THE OWNER SHALL EMPLOY THE CIVIL OR STRUCTURAL ENGINEER OR THE ARCHITECT OF RECORD OR THEIR DESIGNATED AGENT TO PERFORM THE STRUCTURAL OBSERVATION. EVIDENCE OF EMPLOYMENT BY THE OWNER SHALL BE PROVIDED TO THE BUILDING INSPECTOR BEFORE THE FIRST SITE VISIT.
3. WHEN A PRECONSTRUCTION MEETING IS REQUIRED, IT SHALL BE ATTENDED BY THE GENERAL CONTRACTOR, APPROPRIATE SUBCONTRACTORS, AND DEPUTY INSPECTORS. THE MAJOR STRUCTURAL ELEMENTS AND CONNECTIONS WHICH REQUIRE STRUCTURAL OBSERVATION WILL BE IDENTIFIED. A RECORD OF THE MEETING SHALL BE INCLUDED IN THE FIRST OBSERVATION REPORT.
4. REQUIRED OBSERVATIONS ARE TO OCCUR AT THE FOLLOWING STAGES OF CONSTRUCTION AS MINIMUMS FOR EACH BUILDING. NOTIFY THE ENGINEER 72 HOURS PRIOR TO EACH OBSERVATION.

Table with 2 columns: REQUIRED IF CHECKED, ITEMS. Row 1: A. PRECONSTRUCTION MEETING SHALL BE ATTENDED BY THE STRUCTURAL OBSERVER OF RECORD.

- 6. A REPORT PREPARED ON DEPARTMENT FORMS OR FORMS PREPARED BY THE ENGINEER OR ARCHITECT OF RECORD FOR EACH SIGNIFICANT STAGE OF CONSTRUCTION OBSERVED, SHALL BE LEFT AT THE PROJECT SITE FOR THE CONTRACTOR TO FORWARD TO THE BUILDING INSPECTOR. THE FORMS SHALL BE WET SIGNED AND SEALED BY THE RESPONSIBLE STRUCTURAL OBSERVER. ONE SIGNED COPY OF THE REPORT SHALL BE PROVIDED TO THE OWNER, CONTRACTOR, AND DEPUTY INSPECTOR, AS REQUESTED.
7. A FINAL OBSERVATION REPORT MUST BE SUBMITTED WHICH SHOWS THAT ALL OBSERVED DEFICIENCIES WERE RESOLVED AND THE STRUCTURAL SYSTEM GENERALLY CONFORMS TO THE APPROVED PLANS AND SPECIFICATIONS.
8. IF THE OWNER ELECTS TO CHANGE THE STRUCTURAL OBSERVER OF RECORD, THE OWNER SHALL:
A. NOTIFY BUILDING INSPECTOR IN WRITING BEFORE THE NEXT INSPECTION.
B. CALL AN ADDITIONAL PRECONSTRUCTION MEETING, AND FURNISH THE REPLACEMENT STRUCTURAL OBSERVER WITH A COPY OF PREVIOUS OBSERVER'S REPORTS.
C. THE NEW OBSERVER SHALL BE RESPONSIBLE FOR APPROVAL OF THE CORRECTION OF ALL THE ORIGINAL OBSERVATION REPORT DEFICIENCIES.
9. THE OWNER OR ARCHITECT OF RECORD SHALL DEVELOP ALL CHANGES TO THE STRUCTURAL SYSTEMS AT THE CONTRACTOR'S EXPENSE.
10. STRUCTURAL OBSERVATION SHALL BE PERFORMED BY NATIONAL ENGINEERING & CONSULTING, INC.
11. STRUCTURAL OBSERVATION PER SECTION 1709 IS REQUIRED FOR THIS PROJECT. THE ENGINEER OF RECORD SHALL PREPARE AN INSPECTION PROGRAM, INCLUDING THE NAME(S) OF THE INDIVIDUALS OR FIRMS WHO WILL PERFORM THE WORK. THE INSPECTION PROGRAM SHALL BE SHOWN ON THE FIRST SHEET OF THE STRUCTURAL PLANS.



Voluntary Seismic Strengthening
AN INDUSTRIAL BLDG. RETROFIT
1918 E. GLENWOOD BLDG. D
SANTA ANA CA. 92705
JOB NO. R-VolIt-001-D

Table with 2 columns: REVISION, CITY SUBMITTAL. Row 1: 10/11/11, CITY SUBMITTAL.



SHEET TITLE:
GENERAL NOTES
&
SPECIFICATIONS

SHEET NUMBER:
SN-1