APPENDIX T

Seismic Study – McLeod Tower

Seismic Evaluation Report

Palomar Health McLeod Tower (Building C)

555 E Valley Pkwy, Escondido, California

Englekirk

STRUCTURAL ENGINEERS

Seismic Evaluation Report

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555 E Valley Pkwy, Escondido, California

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1.O   GENERAL

1.1   Introduction

This report presents the general building description, seismic evaluation with respect to current engineering practice and proposed seismic rehabilitation for the McLeod Tower at Palomar Health (subsequently referred to as Building C), located at 555 E Valley Pkwy, Escondido, California 92025. Figure 1 shows a general layout of the building location.

1.2   Scope of Work

The scope of work includes the seismic evaluation of Building C; the seismic evaluation includes the following:

- Studying the as-built structural drawings of the original 1967 building prepared by Frank L. Hope & Associates, San Diego, CA; dated December 11, 1967.

- Providing a site visit to confirm that the structural system of the McLeod tower matches that described in the as-built structural drawings and details.

- Conducting three-dimensional elastic dynamic analysis of the lateral force resisting system of the west tower and parking structure according the ASCE 41-13 document.

- Evaluating the structural members of the lateral force resisting system according to the ASCE41-13 requirements.

- Identify structural members that do not have sufficient strength and provide recommendations for the seismic retrofit.

1.3   Seismic Criteria for Evaluation

The seismic evaluation and retrofit scheme outlined in this report is carried out per the requirements of Chapter 3 and 4 of 2016 California Existing Building Code. These requirements establish minimum

standards for the seismic evaluation and design for retrofit of buildings. These requirements adopt, by reference in Section 403, the American Society of Civil Engineers (ASCE) standards for Seismic Rehabilitation of Existing Buildings as documented in ASCE/SEI 41-13 document, henceforth referred to as ASCE-41.

1.4   Rehabilitation Objective

The rehabilitation or retrofit objective defines the desired performance of a rehabilitated building when the building is subjected to seismic hazard of specified intensity. Such objectives are normally selected after considering the cost of the work and the loss estimate, in addition to the benefits derived from rehabilitation, such the improved life safety, the reduction of property loss and the continued use during and after the seismic event.

The key Structural Performance Levels used in ASCE-41 can be summarized as:

- Life Safety Structural Performance Level (LS): Also known as S-3 level, the structure experiences damage to its structural and nonstructural components but remains stable with marginal lateral load reserve capacity.

- Collapse Prevention Structural Performance Level (CP): Also known as S-5 level, the structure experience extensive damage to its components. It continues to support its gravity loads but has no reserve capacity against collapse.

- Immediate Occupancy Structural Performance Level (IO): Also known as S-1, the structure experience minor damage, essentially retains its pre-earthquake design strength and stiffness. Structure remains safe to occupy after minor non-structural repair.

The subject building is classified as Risk Category II per CBC 2016, Table 1604.5. The CEBC 2016 Table 301.1.4.1 requires that both Life Safety (S-3) and Collapse Prevention performance (S-5) levels shall be achieved based on specific earthquake hazard levels for each performance level. Refer to Section 3.4 for further discussion of seismic hazard.

Figure 1. Palomar Health Buildings – Aerial View

2.0   AS-BUILT INFORMATION

2.1   Building Description

Building C is a 10-story concrete shear wall building on grade. It is located North-West of the Building B (red in Figure 1) concrete parking structure. Overall plan dimensions are approximately 184 ft. by 90 ft., shown in Figure 2. There is one setback at Level 4, which holds an outdoor terrace area at the south corner of the building.

The main roof is 116 ft. above grade. There is a 17 ft. tall steel mechanical penthouse structure sits on top of the roof. The elevator tower is about 23 ft. taller than the main roof. Typical story heights are approximately 12 ft. floor-to-floor, with two exceptions: (1) there is an 18 ft. double story between the Ground Level and Level 2 (Level 1 is a mezzanine 9 ft. above grade), (2) the story just above Level 3 is 14 ft. tall. A three-dimensional model of the existing building is shown on Figure 4.

A 6 in. to 16 in. seismic joint east of gridline 10 separates Building C from the adjacent Building B. It is our understanding that other seismic joints need not be considered for the present study.
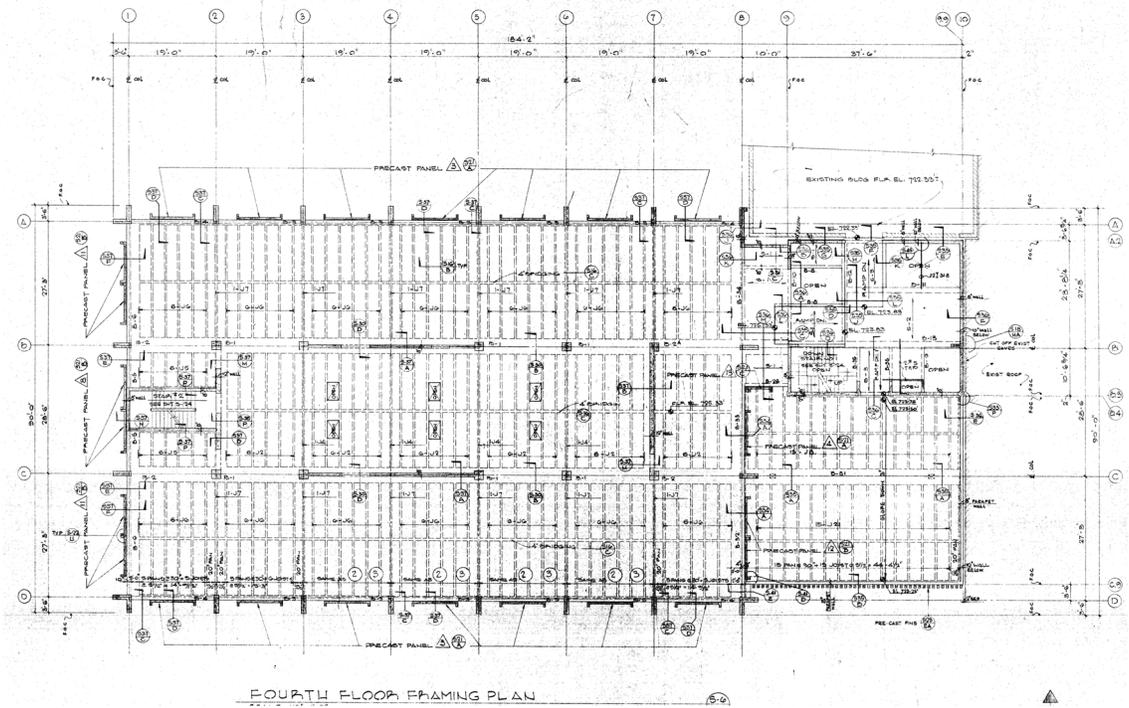
Figure 2. Structural floor plan of Level 4, by Frank L. Hope & Associates. Assumed north is up on plan.
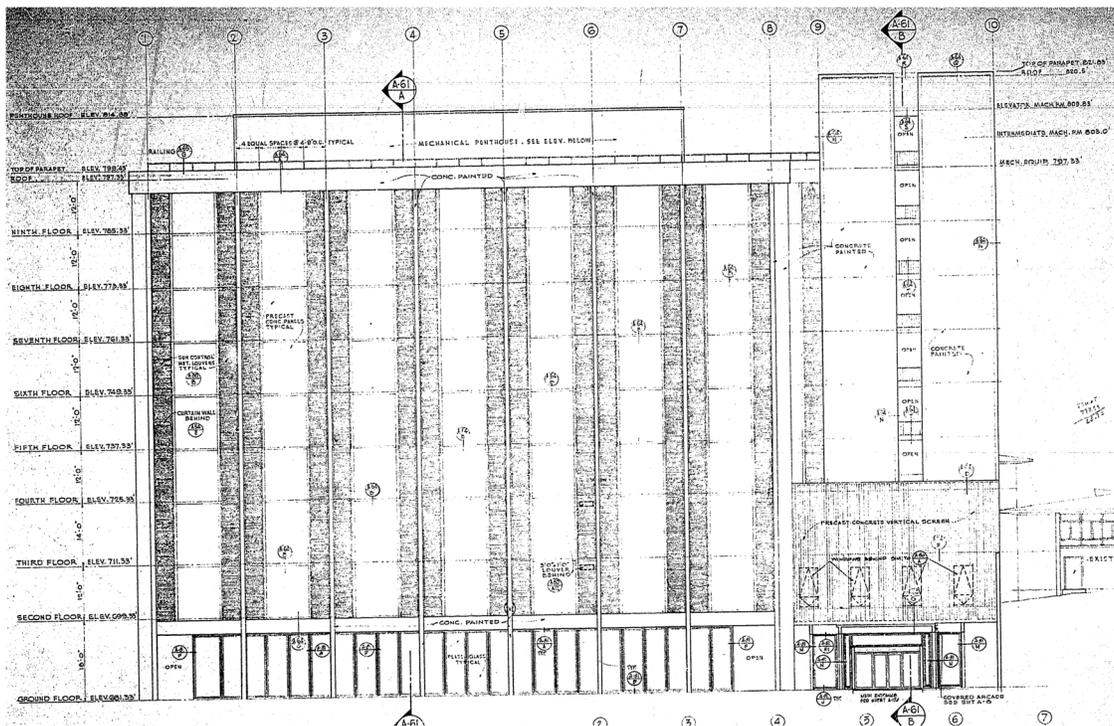
Figure 3. Architectural south elevation, by Frank L. Hope & Associates.
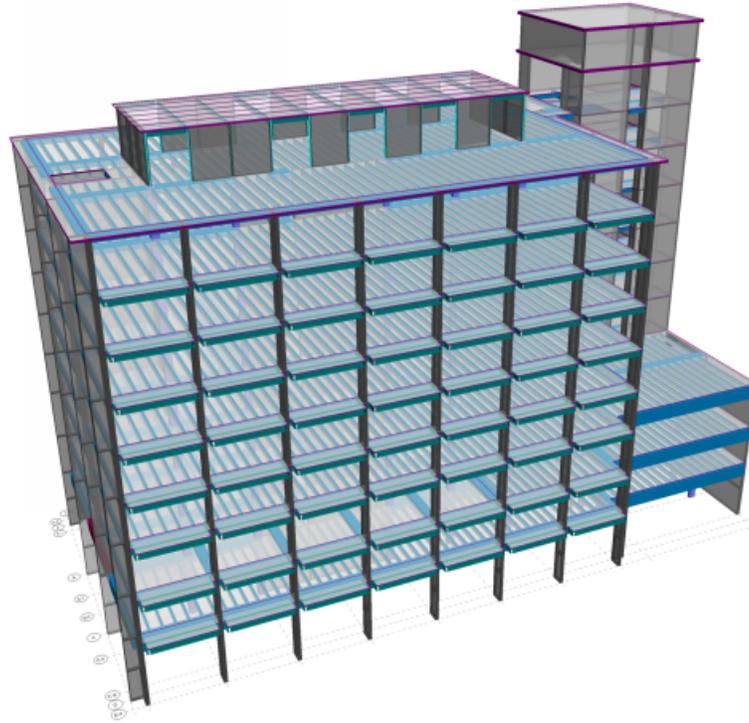
Figure 4. Perspective view of RAM Structural model (Existing with added balconies).

2.2   Structural Systems

2.2.1   Vertical System of the McLeod Tower

Based on the review of the available drawings, the vertical load carrying system consists of a 3" concrete slab supported by 5" x 17" concrete joists (14" pan plus 3" slab). The joists are supported by concrete girders, which frame into concrete columns or walls. The joists are laterally braced at midspan by 4" x 17" bridging. Where concrete joists are not used, the vertical support system consists of either a one-way slab 6" to 10" thick, or a two-way slab 7" to 12" thick. Typical bays are 19 ft. on center in the East-West direction, and 27.25 ft. to 28.5 ft. on center in the North-South direction.

2.2.2   Lateral System of the McLeod Tower

The lateral load resisting system consists of concrete shear walls in both North-South and East-West directions (Figure 5). There are 2 sets of core walls: (1) at the elevator tower, and (2) at stair #2. Between the two cores are two shear wall lines, at Gridline B and C, spanning from Gridline 3 to 5. Perpendicular is

a shear wall line at Gridline 7, spanning from Gridline B to C. Additional concrete walls are present below Level 4 at gridlines 10 and B.6, and within the elevator core. All concrete shear walls are 8", 10", or 12" thick. Reinforcement is minimal and does not necessarily meet current minimum reinforcing code requirements nor confinement.

The concrete slabs act as diaphragms to transfer seismic forces from the floor system into the shear walls. The foundation system consists of shallow reinforced concrete spread/combined column footing, and continuous wall footings.
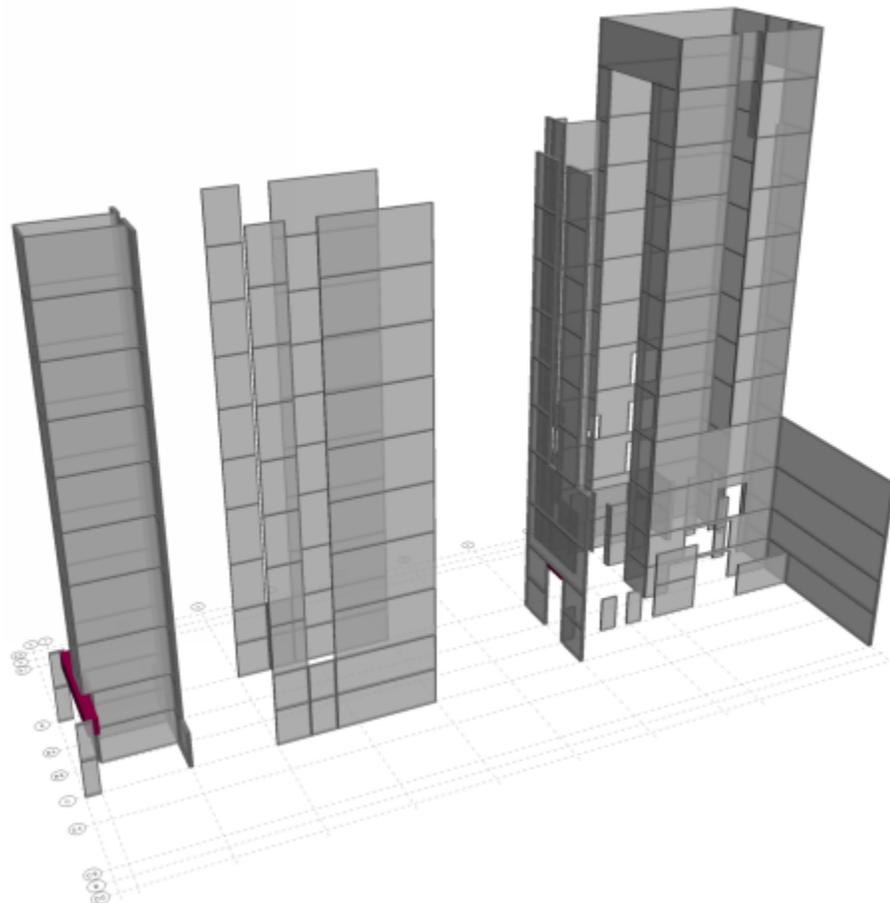
Figure 5. Perspective view of the existing building's lateral system.

2.3   Building Modes

Perspective views of the tower's first three modes are shown in Figure 9 – 11. They correspond to the fundamental periods of: (1) translation in the North-South direction, 2.83 s; (2) translation in the East-West direction, 1.52 s; and (3) rotation about the vertical axis, 0.86 s. The translation modes appear to have rotational components, which is attributed to the fact that the elevator core is much stiffer than the stair #2 core.

2.4   Specified Material Properties

Minimum specified compressive concrete strength at 28 days is f'c=3000 psi (normal weight), except for slab-on-grade concrete which has specified strength of f'c=2000 psi (normal weight). Typical reinforcing bars conform to ASTM A-15 (Grade 40) specifications. Some reinforcing bars are ASTM A-432 (Grade 60) where noted on the column schedule or shear wall elevations. Structural steel is specified as ASTM A-36 (Grade 36) steel.
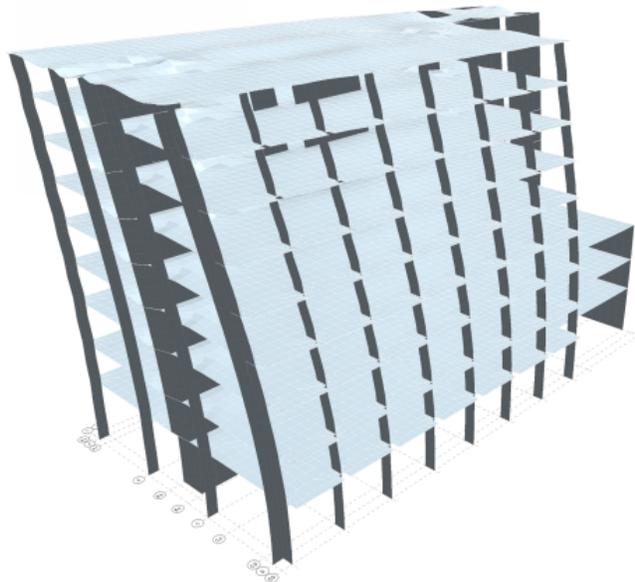
Figure 9. Perspective view of tower 1st mode (North-South translation with rotational component), 2.83 s.
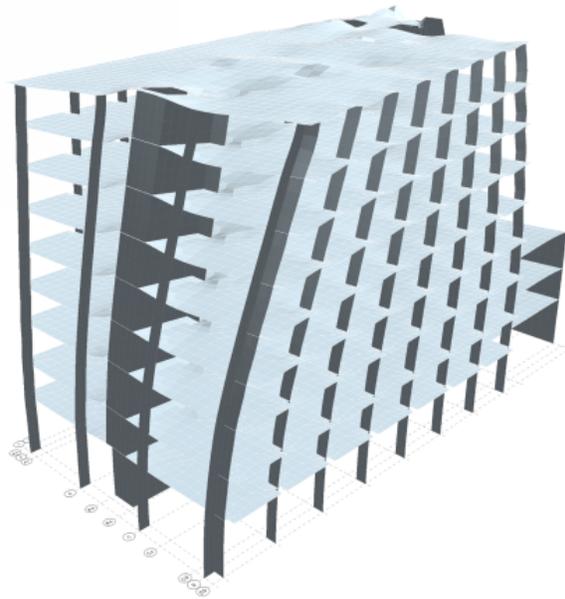
Figure 10. Perspective view of tower 2nd mode (East-West translation with rotational component), 1.52 s.
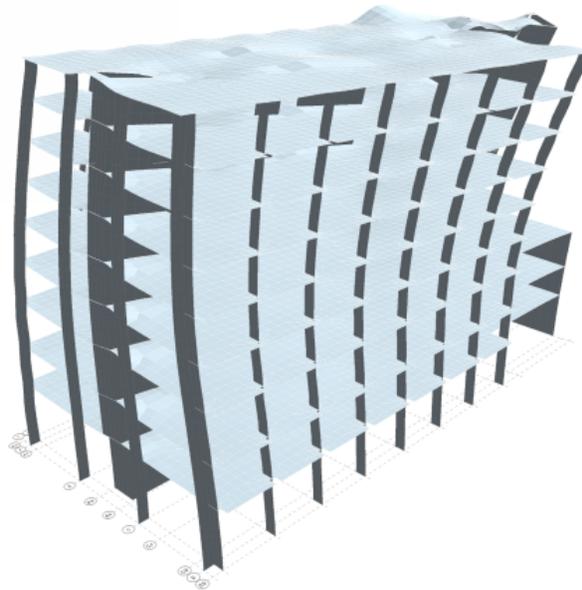
Figure 11. Perspective view of tower 3rd mode (rotation about vertical axis), 0.86 s.

3.0   EVALUATION PROCESS

3.1   General

Building C is modeled using the computer program RAM Structural System. Three-dimensional elastic dynamic analysis is conducted. The assumptions considered in the model are in conformance with Chapters 6 – 10 of the ASCE-41.

3.2   Analytical Procedure

The Linear Dynamic Procedure (LDP) is adopted according to ASCE 41, Section 3.2.1. The mathematical modeling requirements provided in ASCE 41, Section 7.2.3 are used.

3.3   Modeling Assumptions

Rigid and semi-rigid diaphragms are used at each floor. RAM Structural System program determines the center of mass and center of rigidity of for each floor and calculates the torsional effects. The effective stiffness assumptions and strength values of various structural members have been used in conformance to Sections 7.2.3.4 of ASCE-41. The evaluation and retrofit of the steel moment frame beams, columns, connections, and diaphragms, etc., are considered based on the requirements of Chapter 9 of the ASCE-41.

Section 6.2.4 requires that to account for uncertainty in the collection of as-built data, a knowledge factor, k, shall be selected from ASCE-41/Table 6-1 considering the selected rehabilitation objective, analysis procedure, and data collection process. Knowledge factors shall be applied on a component basis as determined by the level of knowledge obtained for individual components during data collection. Available structural drawings provide adequate information regarding the material properties and member sizes required for the evaluation process. As such, a knowledge factor of unity, k=1 was used.

3.4   Configurations Evaluated

Two configurations are studied. In the first (Figure 5), the existing building is altered by removing the exterior precast panels and adding residential balconies supported by steel framing. The second configuration has the same alterations as the first, except structural elements are retrofitted to satisfy

ASCE 41 limit states. Figure 12 shows an aerial view of the second configuration's lateral system, and the specific retrofits are marked up in Appendix B.
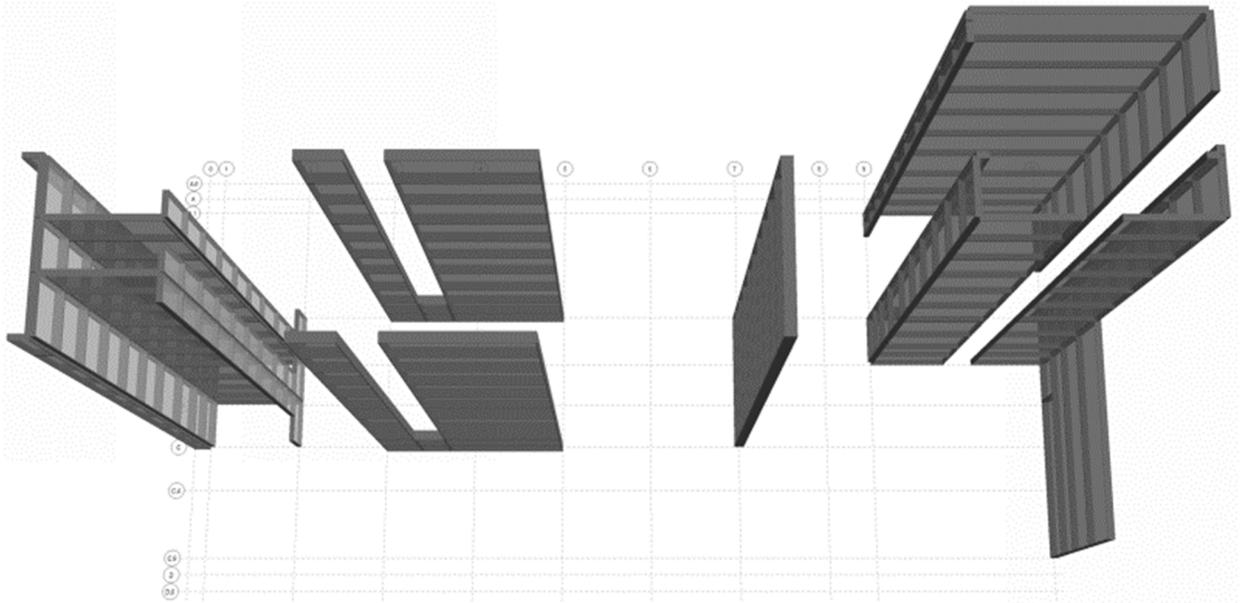
Figure 12. Perspective View from South-West of RAM Structural Model for Building B (Retrofit)

3.5   Seismic Hazard

The evaluation procedure outlined in this report is based on the requirements of Chapter 3 of the California Existing Building Code. Table 301.1.4.1 requires that both Life Safety (S-3) and Collapse Prevention (S-5) performance levels shall be achieved based on specific earthquake hazard levels for each performance level. The Basic Safety Objective is considered as the target for the present study and two basic Earthquake Hazard Levels are considered: Basic Safety Earthquake 1N (BSE-1N) and Basic Safety Earthquake 2N (BSE-2N). To accomplish this objective, both of the following requirements need to be satisfied:

- The building must sustain a seismic hazard level BSE-1N, where the response acceleration parameters are determined according to ASCE-41 Section 2.4.1.2 for the earthquake hazard level of 10% probability of exceedance occurrence in 50 years (10%/50), equivalent to a mean return period of 475 years, while Life Safety target performance is achieved.

- The building must sustain a seismic hazard level BSE-2N, where the response acceleration parameters are determined according to ASCE-41, Section 2.4.1.1 for the earthquake hazard level of 2% probability of exceedance occurrence in 50 years (2%/50), equivalent to a mean return period of 2475 years, while Collapse Prevention target performance is achieved.

Seismic response spectra shown in Figure 13 are created based on the Geocon, Inc. draft report for the Palomar buildings (April 2018). Per Table 7.3.1 of that report, Site Class = C, S_s = 1.045g, S_1 = 0.409g, F_a = 1.00, F_v = 1.391. $S_{XS, BSE-1N}$ = 0.697g, $S_{X1, BSE-1N}$ = 0.380g, $S_{XS, BSE-2N}$ = 1.045g, $S_{X1, BSE-2N}$ = 0.569g. Per ASCE 41, Section 7.4.2.3.1 and 7.4.1.3 the response spectra need not be scaled for Building C.
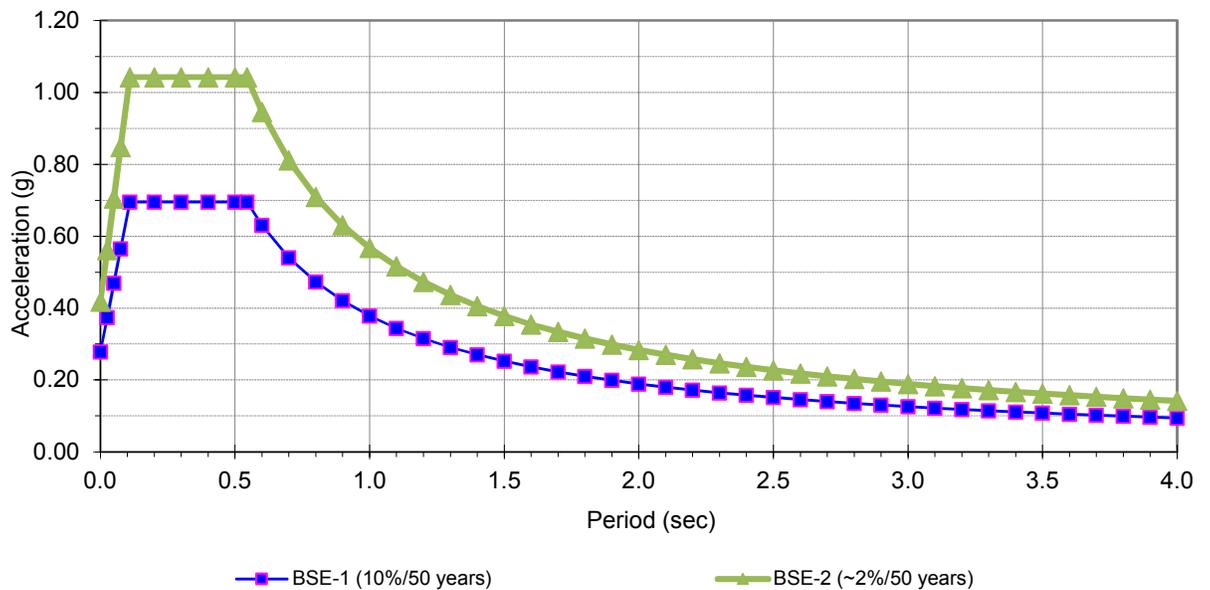
Figure 13. BSE-1N (10% / 50 yrs) and BSE-2N (2% / 50 yrs) Response Spectra

4.0   SEISMIC EVALUATION OF THE EXISTING STRUCTURE

4.1   Strength of Structural Members

The ASCE-41 requires that the strength of structural components shall be evaluated and compared against the seismic demands obtained from the analysis results in order to satisfy the acceptance criteria for both life safety and collapse prevention structural performance levels as the basic safety objective. Prior to selecting component acceptance criteria, components shall be classified as primary and secondary, and actions shall be classified as either deformation or force controlled, as defined in Section 7.5.1. For example, according to Table C7-1 of ASCE-41, deformation controlled actions include shear wall flexure and shear, while force controlled actions include axial forces in columns.

- *Deformation Controlled Actions* shall satisfy Eq.1:

$$mkQ_{CE} \geq Q_{UD} \hspace{5cm} \text{Eq.1}$$

where

m=   component demand modification factor to account for expected ductility associated with this action at the selected structural performance level.

k=   knowledge factor as indicated above;

Q_{CE}=   expected strength (upper bound) of the component at the deformation level under consideration for   deformation controlled action; Strength reduction factor,Φ, shall be taken equal to unity,Φ=1;

Q_{UD}=   deformation controlled design action due to gravity and earthquake loads;

Deformation controlled design action due to gravity and earthquake loads shall be calculated in accordance with Eq.2:

$$Q_{UD} = Q_E + Q_G \hspace{5cm} \text{Eq.2}$$

where

Q_E = action due to earthquake loads obtained from the elastic analysis;

Q_G = action due to design gravity loads;

The action due to design gravity loads shall be obtained in accordance with Eq.3:

$$Q_G = 1.1(Q_D + Q_L)$$
Eq.3

where

Q_D = action due to design dead loads;

Q_L = action due to design live load, equal to 25% of unreduced design live load, but not less than the actual live load;

- *Force Controlled Actions* shall satisfy Eq.4:

$$kQ_{CL} \geq Q_{UF}$$
Eq.4

where

Q_{CL} = specified (lower bound) strength of the component at the deformation level under consideration for force controlled action; Strength reduction factor,Φ, shall be taken equal to unity,$\Phi=1$;

Q_{UF} = force controlled action due to gravity loads in combination with earthquake loads;

The force controlled action due to gravity loads in combination with earthquake loads shall be calculated in accordance with Eq.5:

$$Q_{UF} = Q_G \pm Q_E/C_1C_2J$$
Eq.5

where

C_1= modification factor to relate expected maximum inelastic displacements calculated for linear elastic response as defined per ASCE-41, Section 7.4.1.3;

C_2= modification factor to represent the effect of pinched hysteresis shape, cyclic stiffness degradation, and strength deterioration on maximum displacement response, as defined per ASCE-41, Section 7.4.1.3;

J= force delivery reduction factor, greater than or equal to 1.0, taken as a smallest demand capacity ratio of the components in the load path delivering force to the component in question, as defined per ASCE-41, Equation 7-16;

Strength of concrete shear walls, diaphragms, columns, connections, etc. are evaluated based on these acceptance criteria and findings are summarized in the Sections 4.2 – 4.3.

4.2   Summary of the Seismic Evaluation for the McLeod Tower

4.2.1   Lateral System

Existing lateral framing system layout and distribution requires retrofit to satisfy the Life Safety and Collapse Prevention performance objectives. The performance of various components is discussed below.

4.2.2   Concrete Shear Walls

All concrete shear walls are 8", 10", or 12" thick. Reinforcement is minimal and does not necessarily meet minimum reinforcing code requirements nor confinement. Concrete shear walls are considered deformation-controlled in flexure and shear. Corresponding m-factors are obtained from Table 10-21 and Table 10-22 of ASCE 41. Existing walls require added thickness and reinforcement to satisfy ASCE 41 limit states. Retrofits are marked up in Appendix B.

4.2.3   Diaphragms

A typical diaphragm consists of a 3" thick concrete slab with 6"x6" 6/6 (i.e., 6"x6" W2.9/W2.9) wire mesh. Checked are the existing diaphragm shear capacity, the shear transfer between the diaphragm and concrete beam collectors, the connections between collectors and shear walls, and the chord reinforcing. The m-factors are determined per ASCE 41, Section 10.10.2.4. Certain components including collector reinforcement do not have adequate strength to withstand the seismic force demands. Recommendations are marked in Appendix B.

4.2.4   Columns

Concrete columns have adequate dimensions and longitudinal reinforcement to carry the proposed residential gravity loads. Tie spacing, which on the order of 12 in. on center with 90° hooks, is insufficient to satisfy acceptance criteria. Recommendations to improve confinement is marked in Appendix B.

4.2.5   Foundations

Foundation soil bearing pressure and footing reinforcement design are checked, and retrofit is required as marked in Appendix B. Allowable bearing pressures are assumed to be 15,000 psf with a 1/3 increase for service-level seismic load combinations.

4.2.6   Building Deformation - Story Drifts

Drift ratio is defined as the difference in displacements between two adjacent stories divided by the story height. Story drift ratio is an important measure that indicates the extent of damage anticipated in both structural and nonstructural members. The existing building exhibited a maximum code-equivalent drift ratio of 2.1%, which exceeds the 2.0% limit prescribed by current building code. The retrofits reduce drift to satisfy code limits.

Building C is separated from the adjacent Building B by a seismic joint of 6 in. at Level 3, 8 in. at Level 4, 14 in. at Level 6, and 16 in. above Level 6. The story displacements along building height in both directions for both 2%/50 and 10%/50 year's earthquakes increase gradually from zero at the base to its maximum value at roof levels. With the recommended retrofit, the combined calculated deflections at all levels obtained from the evaluation analysis for both buildings are less than the corresponding gap width. The building separation acceptance criteria as defined in ASCE 41, Section 7.2.13.1 is satisfied.

Therefore, the pounding effect is prevented for both life safety and collapse prevention structural performance levels.

5.0 GRAVITY EVALUATION OF THE EXISTING STRUCTURE

5.1 Loading Criteria

The original building was originally designed as a hospital but will be repurposed for residential use. Per CEBC Section 403.3, "an alteration [that] causes an increase in design gravity load of more than 5 percent shall be strengthened, replaced or otherwise altered as needed to carry the increased gravity load required by the California Building Code for new structures." Gravity framing is evaluated using the following code load combinations:

$1.4D$	Eq.6
$1.2D + 1.6(L + H) + 0.5L_r$	Eq.7
$1.2D + 1.6L_r + 1.6H + f_1L$	Eq.8

where

D = Dead Load

L = Live Load

L_r = Roof Live Load

H = Soil Load

f_1 = 1.0 for places of public assembly live loads more than 100 psf, and parking garages;

0.5 for other live loads.

The estimated load criteria are summarized in Table 1 and Appendix A. The load criteria will likely change as the design procedure progresses and architectural requirements solidify. Additional loads not previously considered in this evaluation may impact the retrofit requirements of beams that carry the added loads.

Table 1. Summary of Loading Criteria

Area	Dead Load[1] (psf)	Live Load[2] (psf)	Mass[3] (psf)
Roof	82.5	20 (R)	156.7
Roof w/Penthouse	82.5	20 (R)	306.2
Roof w/Elevator	115.0	20 (R)	854.6
Interior Floor	47.5	40 (R)	151.5
Exterior Balcony	71.4	60 (R)	83.4
Elevator Lobby	85.0	100 (UR)	143.6
Level 4 Terrace	197.5	100 (UR)	283.1
L3 Grid 1-6	97.5	40 (R)	197.8
L2 Grid 6-8&A-B.6	135.0	40 (R)	209.6
L1 Grid 6-8&A-B.6	135.0	100 (UR)	207.2

[1]For gravity analysis, the RAM program is set to internally compute the self-weight of joists, beams, columns, and walls.

[2]UR = Unreducible, R = Reducible

[3]For lateral analysis, the self-weight mass of beams, column, and slabs are included in the table. The RAM program is set to internally compute the self-weight mass of concrete shear walls.

[4]20 psf (vertical plane) exterior wall weight is also applied at the building perimeter.

5.2   Gravity Evaluation

In general, loads are not expected to have increased significantly due to alteration. Thus, slab, joist, and beam designs are expected to result in adequate performance. However, gravity framing systems for typical slabs require a more in-depth concrete slab analysis, once architectural design requirements are established. Such evaluation is not included in the current report. Additionally, the roof penthouse structure is not part of the current evaluation; however, loads from the penthouse are incorporated in the seismic evaluation.

At the exterior perimeter, precast panels are removed and steel framed exterior balconies are added. Per estimated load criteria, columns are evaluated in 4.2.4.

6.0   CONCLUSION AND RECOMMENDED SEISMIC RETROFIT CONCEPT

Based upon a review of the record drawings and an evaluation of the building's vertical and lateral system using ASCE 41 Tier 3 requirements, it is our opinion that the proposed building needs retrofit in order to achieve an earthquake performance level that is consistent with the Life Safety and Collapse Prevention Performance Objective for Existing Buildings.

As demonstrated in the evaluation process, certain components do not have adequate strength to withstand the seismic force demands. These components are marked up in Appendix B. Retrofit measures are recommended to strengthen the existing inadequate members and eliminate the building deficiencies per ASCE 41. Retrofit can be achieved by increasing the size of the existing members, adding new structural members to reduce the demands on the deficient members or enhance the performance of the members by improving connections.

References

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2.   AISC (2010). AISC 360-10: Specification for Structural Steel Buildings, 2010 edition. American Institute of Steel Construction, Chicago, IL.

3.   AISC (2010). AISC 341-10: Seismic Provisions for Structural Steel Buildings, 2010 edition. American Institute of Steel Construction, Chicago, IL.

4.   ASCE (American Society of Civil Engineers) (2013). ASCE 41-13, Seismic Rehabilitation of Existing Buildings. American Society of Civil Engineers, Reston, VA.

5.   ASCE (American Society of Civil Engineers) (2010). ASCE 7-10, Minimum Design Loads for Buildings and Other Structures. American Society of Civil Engineers, Reston, VA.

6.   CBC (2016 California Building Code), Based on 2015 International Building Code, California Building Standards Commission, Sacramento, CA.

7.   Geocon, Inc. (April 2018 Draft). Geotechnical Investigation: Palomar Heights, Escondido, California. Project No. G2109-11-02. Geocon Inc., San Diego, CA.

8.   RAM Structural System Version 15i; 3D Analysis of Building Structures, Bentley Systems, Inc. (2017) Exton, PA.

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Please do not hesitate to contact us should you have any questions,

Sincerely,

Abel Dizon, PhD, EIT

Design Engineer

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APPENDIX A

Load Criteria

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Date   4/2018
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LOAD CRITERIA – Typical Roof

Structure: McLeod Tower
Location: Typical Roof
System: 6x17@2'-8"o.c. concrete joists + 3" concrete

Vertical Design

	Dead Load	Live/Special Load
3" Slab[1]	37.5 psf	
2" Conc. Topping	25.0	
Roofing & Rigid Insulation	10.0	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
Dead Load for Gravity Design[2]	**82.5 psf**	**20/16/12 psf (Roof)**
6x17@2'-8" NWC joists[4]	34.1	
Concrete Beams[5]	30.2	
Columns[6]	9.9	
Dead Load for Seismic[7]	**156.7 psf + Shear Wall Wt. + Ext. Walls**	
Dead Load for Seismic Under Penthouse[8]	**306.2 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

1. 150 pcf * 3/12 = 37.5 psf
2. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
3. 150 pcf * (83*47+133*3) ft * (6"*14"pan/144) ft²/(83ft*133ft) = 34.1 psf
4. 150 pcf * [(10*30/144)ft²*(133*2+83*2)ft
       +(42*17/144)ft²*(133*2)ft] /(83ft*133ft) = 30.2 psf
5. 150 pcf * [(12*48/144)ft²*6ft*24
       +(24*24/144)ft²*6ft*4
       +(18*18/144)ft²*6ft*4] /(83ft*133ft) = 9.9 psf
6. RAM SS to internally compute wall wt. for seismic, Ext Walls = 20 psf (vertical plane)
7. Penthouse load:

Deck + LWC:	2.2psf + 30pcf*(8.5/12)	= 23.5 psf
Open Web Joists & Bridging:		= 2.0
Columns & Braces:		= 3.0
Metal Stud wall:		= 16.0
Misc.:	300,000lb/2870 ft²	= 105.0
Total:		= 149.5

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LOAD CRITERIA – Roof Elevator Area

Structure: McLeod Tower
Location: Roof Elevator Area (Level 5-9)
System: 6" one-way normal weight concrete slab w/ concrete beams

Vertical Design

	Dead Load	Live/Special Load
6" Slab[1]	75.0 psf	
Roofing, Insulation, etc.	30.0	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
	_____	
Dead Load for Gravity Design[2]	**115.0 psf**	**20/16/12 psf (Roof)**
Partition load for seismic[3]	20.0 psf	
Concrete Beams[4]	38.6	
Elevator Tower[5]	681.0	
	_____	
Dead Load for Seismic[6]	**854.6 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

1. 150 pcf * 6/12 = 75 psf
2. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
3. Partition load: Use 20psf for lateral
4. 150 pcf * [(8*17/144)ft²*(10+18+12+12+6+10)ft
   +(42*17/144)ft²*6.5ft
   + (14*22/144)ft²*(26+24)ft
   + (16*24/144)ft²*33ft] /(835+296ft²) = 38.6 psf
5. Elevator Tower load:
   Walls: 150 pcf*(8/12)ft*23ft*(34.6*2+37.8*2)ft/1308ft² = 255 psf
   Slabs: 150 pcf*(6/12)ft*(2*1308 + 355)ft² /1308ft² = 170 psf
   Conc. Beams: 150 pcf*(12*36/144)ft²*34.6ft/1308 = 12 psf
   Steel Beams: 3 +12 psf = 15 psf
   Misc.:   300,000 lb/1308 ft² = 229 psf
   Total: = 681 psf
8. RAM SS to internally compute wall wt. for seismic, no columns in this area, Ext Walls = 20 psf (vertical plane)

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Sheet #

LOAD CRITERIA – Typical Interior Floor

Structure: McLeod Tower
Location: Typical Interior Floor (Level 5-9)
System: 6x17@2'-8"o.c. concrete joists + 3" concrete

Vertical Design

	Dead Load	Live/Special Load
3" Slab[1]	37.5 psf	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
	_____	
Dead Load for Gravity Design[2]	**47.5 psf**	**40 psf (Reducible)**
Partition load for seismic[3]	20.0 psf	
6x17@2'-8" NWC joists[4]	34.1	
Concrete Beams[5]	30.2	
Columns[6]	19.7	
	_____	
Dead Load for Seismic[7]	**151.5 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

9. 150 pcf * 3/12 = 37.5 psf
10. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
11. Partition load: Use 20psf for lateral
12. 150 pcf * (83*47+133*3) ft * (6"*14"pan/144) ft²/(83ft*133ft) = 34.1 psf
13. 150 pcf * [(10*30/144)ft²*(133*2+83*2)ft
    +(42*17/144)ft²*(133*2)ft] /(83ft*133ft) = 30.2 psf
14. 150 pcf * [(12*48/144)ft²*12ft*24
    +(24*24/144)ft²*12ft*4
    +(18*18/144)ft²*12ft*4] /(83ft*133ft) = 19.7 psf
15. RAM SS to internally compute wall wt. for seismic, Ext Walls = 20 psf (vertical plane)

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Suite 125	714.557.5530 fax	Date	4/2018
Santa Ana, CA		Initials	AD
92704-6924		Sheet #	

LOAD CRITERIA – Typical Exterior Balcony

Structure: McLeod Tower
Location: Typical Exterior Balcony
System: W2 metal deck w/ 5 1/2" Hardrock Concrete

Vertical Design

	Dead Load	Live/Special Load
W2 Metal Deck w/ 5 1/2" Hardrock[1]	56.4 psf	
Finish	5.0	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
Dead Load for Steel Framing Design	**71.4 psf**	**60 psf (Reducible)**
Steel framing	12.0	
Dead Load for Seismic Design	**83.4 psf**	**+ Exterior Wall Wt.**

Notes:

1. Verco Catalog: W2-20 gage w/ 5 1/2" Hardrock Concrete = 2.0 + 54.4 = 56.4 psf
2. Ram System adds the steel framing weight for gravity design

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92704-6924

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Sheet #

LOAD CRITERIA – Typical Elevator Lobby

Structure: McLeod Tower
Location: Typical Elevator Lobby
System: 6" one-way normal weight concrete slab w/ concrete beams

Vertical Design

	Dead Load	Live/Special Load
6" Slab[1]	75.0 psf	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
	_____	
Dead Load for Gravity Design[2]	**85.0 psf**	**100 psf (Unreducible)**
Partition load for seismic[3]	20.0 psf	
Concrete Beams[4]	38.6	
	_____	
Dead Load for Seismic[5]	**143.6 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

6. 150 pcf * 6/12 = 75 psf
7. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
8. Partition load: Use 20psf for lateral
9. 150 pcf * [(8*17/144)ft²*(10+18+12+12+6+10)ft
        +(42*17/144)ft²*6.5ft
        + (14*22/144)ft²*(26+24)ft
        + (16*24/144)ft²*33ft] /(835+296ft²) = 38.6 psf
10. RAM SS to internally compute wall wt. for seismic, no columns in this area

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LOAD CRITERIA – Level 4 Terrace

Structure: McLeod Tower
Location: Level 4 Terrace
System: 6x17@2'-8"o.c. concrete joists + 3" concrete

Vertical Design

	Dead Load	Live/Special Load
3" Slab[1]	37.5 psf	
Pavers	50.0	
Planters	100.0	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
Dead Load for Gravity Design[2]	**197.5 psf**	**100 psf (Unreducible)**
6x17@2'-8" NWC joists[3]	34.1 psf	
Concrete Beams[4]	30.2	
Columns[5]	21.3	
Dead Load for Seismic[6]	**283.1 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

1. 150 pcf * 3/12 = 37.5 psf
2. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
3. 150 pcf * (83*47+133*3) ft * (6"*14"pan/144) ft²/(83ft*133ft) = 34.1 psf
4. 150 pcf * [(10*30/144)ft²*(133*2+83*2)ft
    +(42*17/144)ft²*(133*2)ft] /(83ft*133ft) = 30.2 psf
5. 150 pcf * [(12*48/144)ft²*13ft*24
    +(24*24/144)ft²*13ft*4
    +(18*18/144)ft²*13ft*4] /(83ft*133ft) = 21.3 psf
6. RAM SS to internally compute wall wt. for seismic, Ext Walls = 20 psf (vertical plane)

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LOAD CRITERIA – Level 3, Grid 1 to 6

Structure: McLeod Tower
Location: Level 3, Grid 1 to 6
System: 7" two-way normal weight concrete slab w/ concrete beams

Vertical Design

	Dead Load	Live/Special Load
7" Slab[1]	87.5 psf	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
	_____	
Dead Load for Gravity Design[2]	**97.5 psf**	**40 psf (Reducible)**
Partition load for seismic[3]	20.0 psf	
Concrete Beams[4]	59.0	
Concrete Columns[5]	21.3	
	_____	
Dead Load for Seismic[6]	**197.8 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

1. 150 pcf * 10/12 = 125 psf
2. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
3. Partition load: Use 20psf for lateral
4. 150 pcf * [(30*17/144)ft²*(83*4)ft
    +(42*17/144)ft²*(95*2+83)ft
    +(10*30/144)ft²*(95*2+83)ft] /(83ft*95ft) = 59.0 psf
5. 150 pcf * [(12*48/144)ft²*13ft*24
    +(24*24/144)ft²*13ft*4
    +(18*18/144)ft²*13ft*4] /(83ft*133ft) = 21.3 psf
6. RAM SS to internally compute wall wt. for seismic, Ext Walls = 20 psf (vertical plane)

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LOAD CRITERIA – Level 2, Grid 6 to 8, A to B.6

Structure: McLeod Tower
Location: Level 2, Grid 6 to 8, A to B.6
System: 10" two-way normal weight concrete slab w/ concrete beams

Vertical Design

	Dead Load	Live/Special Load
10" Slab[1]	125.0 psf	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
Dead Load for Gravity Design[2]	**135.0 psf**	**40 psf (Reducible)**
Partition load for seismic[3]	20.0 psf	
Concrete Beams[4]	37.4	
Concrete Columns[5]	17.2	
Dead Load for Seismic[6]	**209.6 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

1. 150 pcf * 10/12 = 125 psf
2. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
3. Partition load: Use 20psf for lateral
4. 150 pcf * [(42*17/144)ft²*38ft
    +(42*12/144)ft²*38ft
    +(12*30/144)ft²*46ft] /(83ft*95ft) = 37.4 psf
5. 150 pcf * [(12*48/144)ft²*10.5ft*24
    +(24*24/144)ft²*10.5ft*4
    +(18*18/144)ft²*10.5ft*4] /(83ft*133ft) = 17.2 psf
6. RAM SS to internally compute wall wt. for seismic, Ext Walls = 20 psf (vertical plane)

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LOAD CRITERIA – Level 1, Grid 6 to 8, A to B.6

Structure: McLeod Tower
Location: Level 1, Grid 6 to 8, A to B.6
System: 10" two-way normal weight concrete slab w/ concrete beams

Vertical Design

	Dead Load	Live/Special Load
10" Slab[1]	125.0 psf	
Ceiling	5.0	
Mech./Misc./ Sprinkler	5.0	
	_____	
Dead Load for Gravity Design[2]	**135.0 psf**	**100 psf (Unreducible)**
Partition load for seismic[3]	20.0 psf	
Concrete Beams[4]	37.4	
Concrete Columns[5]	14.8	
	_____	
Dead Load for Seismic[6]	**207.2 psf + Shear Wall Wt. + Ext. Walls**	

Notes:

1. 150 pcf * 10/12 = 125 psf
2. RAM SS to internally compute beam, column, and wall self-wt. for gravity.
3. Partition load: Use 20psf for lateral
4. 150 pcf * [(42*17/144)ft²*38ft
       +(42*12/144)ft²*38ft
       +(12*30/144)ft²*46ft] /(83ft*95ft) = 37.4 psf
5. 150 pcf * [(12*48/144)ft²*9ft*24
       +(24*24/144)ft²*9ft*4
       +(18*18/144)ft²*9ft*4] /(83ft*133ft) = 14.8 psf
6. RAM SS to internally compute wall wt. for seismic, Ext Walls = 20 psf (vertical plane)

APPENDIX B

Retrofit Markups
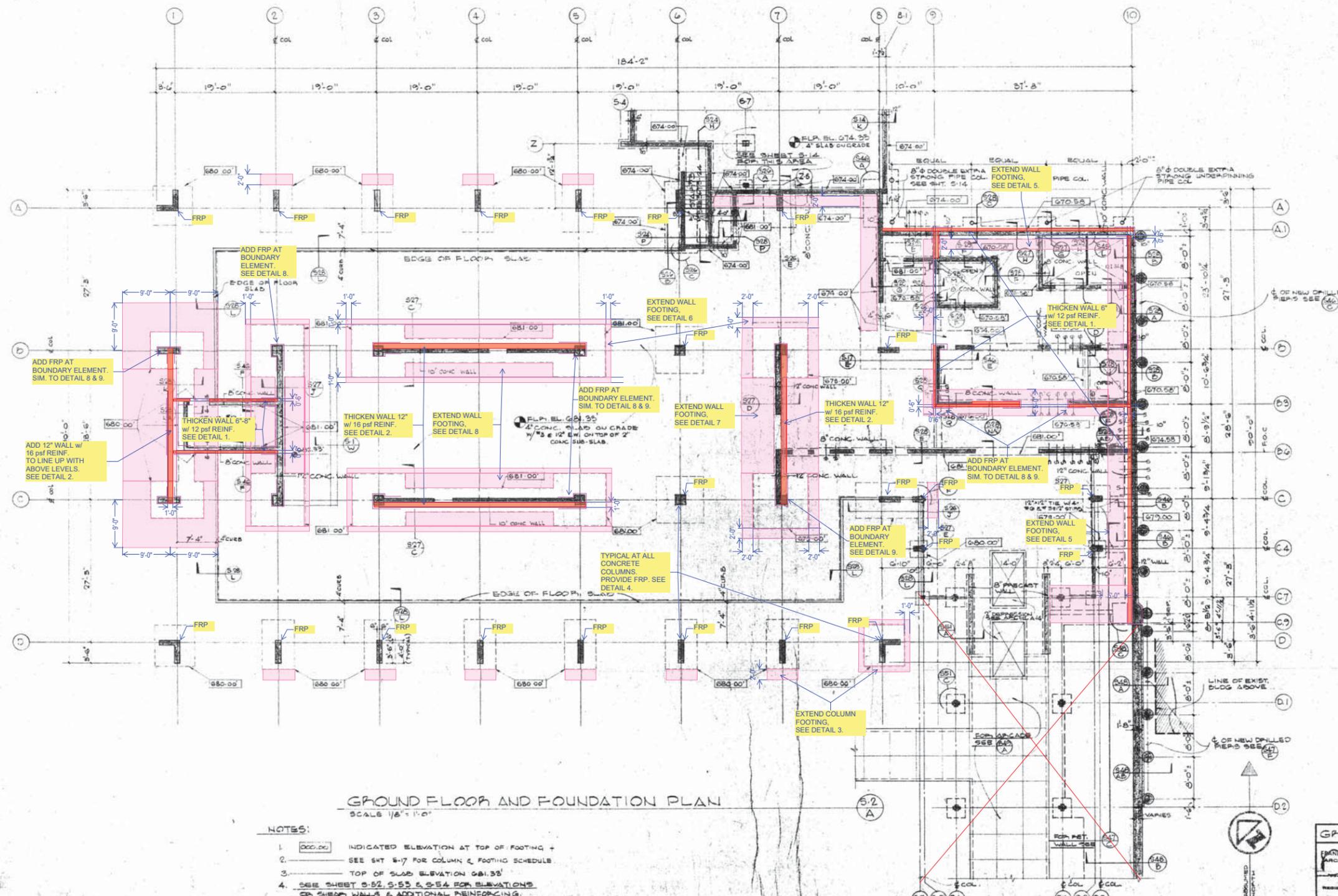
GROUND FLOOR AND FOUNDATION PLAN
SCALE 1/8" = 1'-0"

184'-2"

ADD FRP AT BOUNDARY ELEMENT, SEE DETAIL 8.
ADD FRP AT BOUNDARY ELEMENT, SIM. TO DETAIL 8 & 9.
ADD 12" WALL w/ 16 psf REINF. TO LINE UP WITH ABOVE LEVELS. SEE DETAIL 2.
THICKEN WALL 6'-8" w/ 12 psf REINF. SEE DETAIL 1.
THICKEN WALL 12" w/ 16 psf REINF. SEE DETAIL 2.
EXTEND WALL FOOTING, SEE DETAIL 8.
ADD FRP AT BOUNDARY ELEMENT, SIM. TO DETAIL 8 & 9.
EXTEND WALL FOOTING, SEE DETAIL 7.
EXTEND WALL FOOTING, SEE DETAIL 6
ADD FRP AT BOUNDARY ELEMENT, SEE DETAIL 9.
THICKEN WALL 12" w/ 16 psf REINF. SEE DETAIL 2.
TYPICAL AT ALL CONCRETE COLUMNS. PROVIDE FRP. SEE DETAIL 4.
EXTEND COLUMN FOOTING, SEE DETAIL 3.
EXTEND WALL FOOTING, SEE DETAIL 5
THICKEN WALL 6" w/ 12 psf REINF. SEE DETAIL 1.
EXTEND WALL FOOTING, SEE DETAIL 5.
ADD FRP AT BOUNDARY ELEMENT, SEE DETAIL 9.

EDGE OF FLOOR SLAB
EDGE OF FLOOR SLAB
EDGE OF FLOOR SLAB

8"∅ DOUBLE EXTRA STRONG PIPE COL. SEE SHT. S-14
8"∅ DOUBLE EXTRA UNDERPINNING PIPE COL.
LINE OF EXIST. BLDG ABOVE

NOTES:
1. 000.00 — INDICATED ELEVATION AT TOP OF FOOTING +
2. SEE SHT S-17 FOR COLUMN & FOOTING SCHEDULE.
3. TOP OF SLAB ELEVATION 681.38'
4. SEE SHEET S-52, S-53 & S-54 FOR ELEVATIONS OR SHEAR WALLS & ADDITIONAL REINFORCING.

KEY PLAN
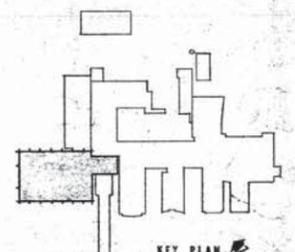
GROUND FLOOR & FOUNDATION PLAN

FRANK L. HOPE & ASSOCIATES
ARCHITECTS AND ENGINEERS
FRANK L. HOPE JR.
REGISTERED ARCHITECT

DRAWN BY
CHECKED S.E.
DATE 12-11-67
PROJECT No. 66-26

S-2

OF 456 SHEETS

PALOMAR MEMORIAL HOSPITAL

THE NORTHERN SAN DIEGO COUNTY HOSPITAL DISTRICT • ESCONDIDO CALIFORNIA

ARCHITECTS AND ENGINEERS • FRANK L. HOPE & ASSOCIATES | ASSOCIATED ARCHITECTS • KILLINGSWORTH-BRADY & ASSOCIATE | PLANNING CONSULTANTS • MEDICAL PLANNING ASSOCIATES
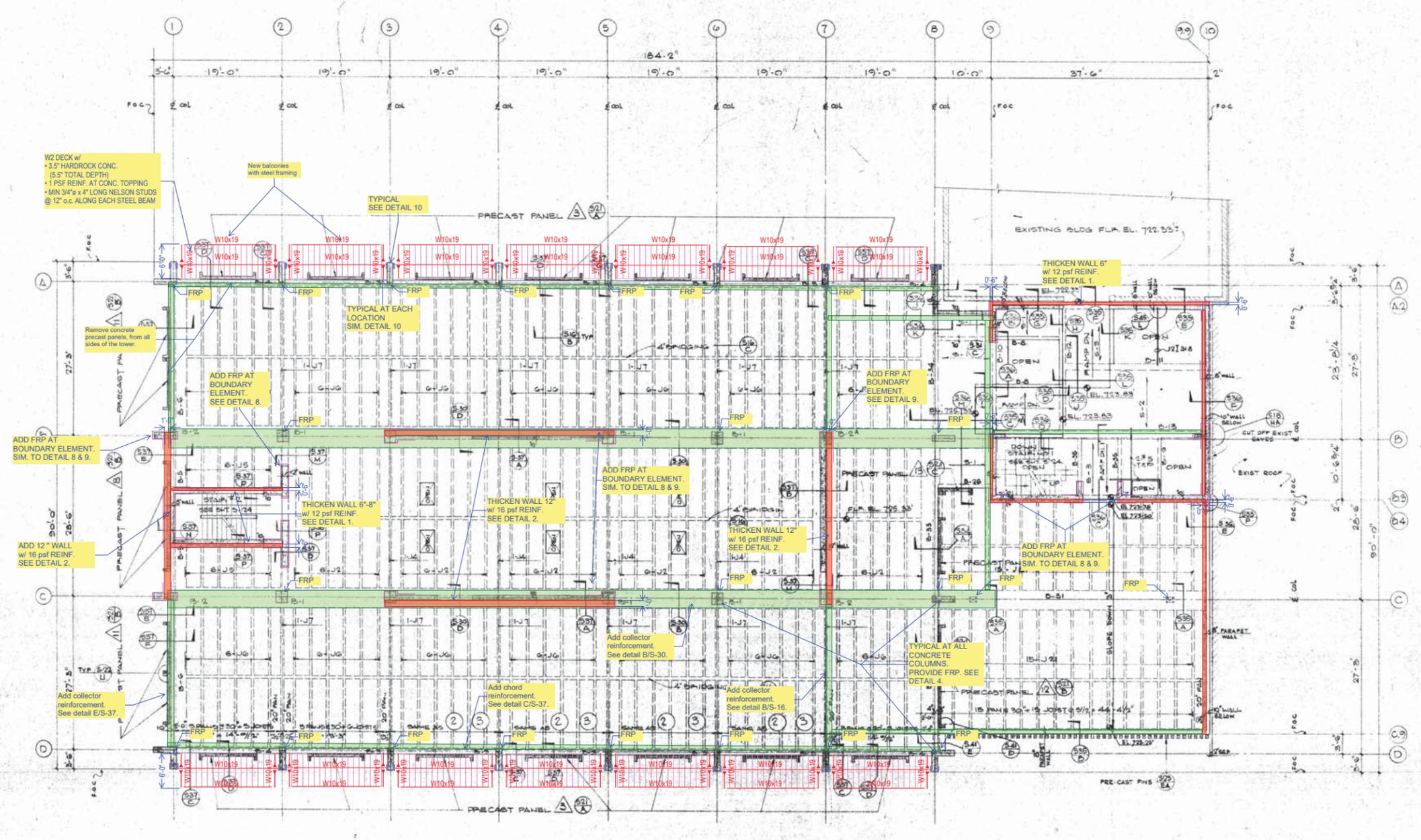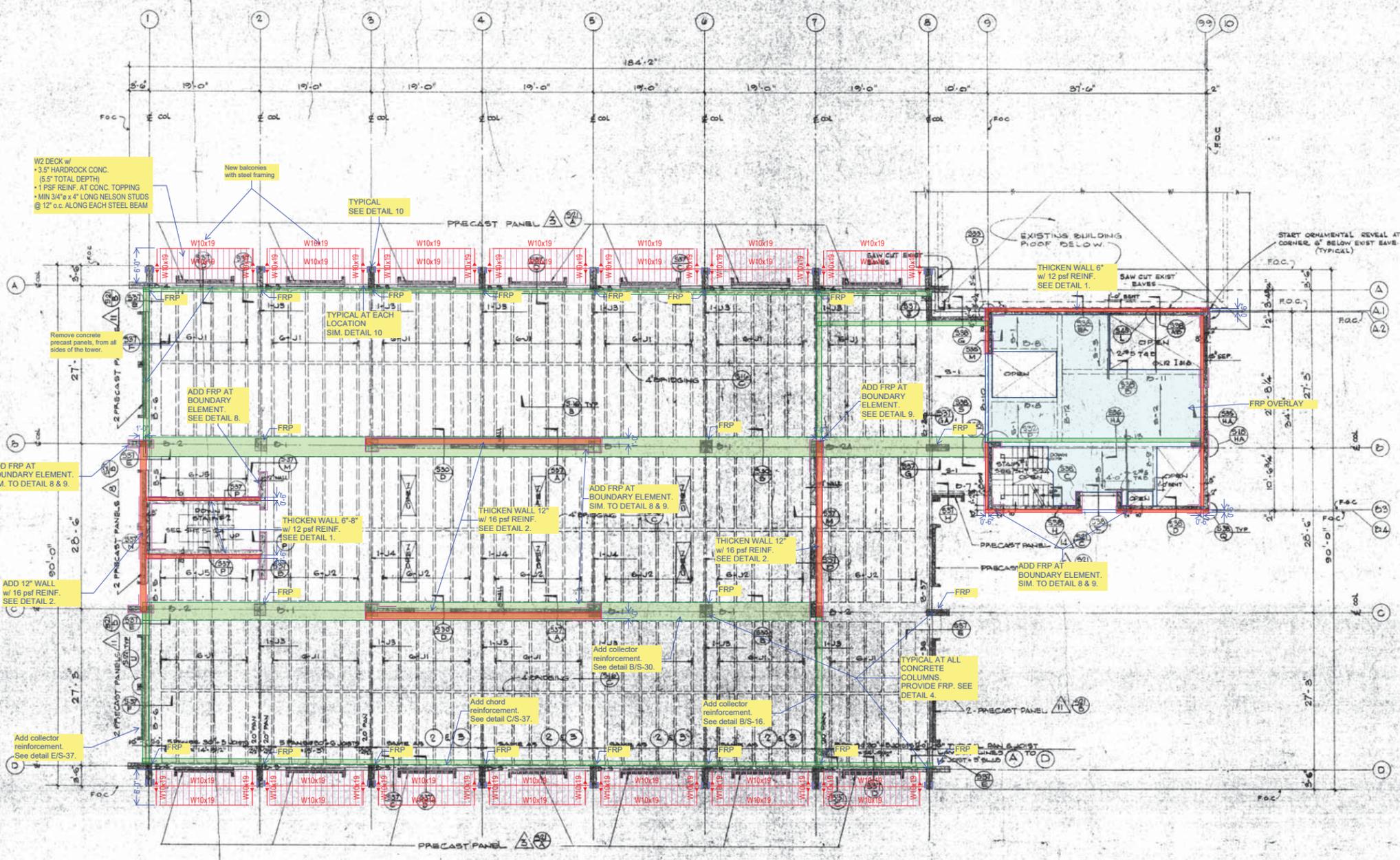
FOURTH FLOOR FRAMING PLAN
SCALE 1/8" = 1'-0"

NOTES:
1. TOP OF SLAB ELEVATION 725.33' (EXCEPT AT RAMPS AND TERRACE)
2. SEE SHEET S-16 FOR JOIST SCHEDULE
3. SEE SHEET S-17 FOR COLUMN SCHEDULE
4. SEE SHEET S-18 & S-30 FOR BEAM SCHEDULE
5. SEE SHEET S-17 FOR SLAB SCHEDULE
△ DENOTES PRECAST PANEL NUMBER - SH. S-21

Annotations (yellow callouts):
- W2 DECK w/ 3.5" HARDROCK CONC. (5.5" TOTAL DEPTH) • 1 PSF REINF. AT CONC. TOPPING • MIN 3/4"ø x 4" LONG NELSON STUDS @ 12" o.c. ALONG EACH STEEL BEAM
- New balconies with steel framing
- TYPICAL SEE DETAIL 10
- Remove concrete precast panels, from all sides of the tower.
- TYPICAL AT EACH LOCATION SIM. DETAIL 10
- THICKEN WALL 6" w/ 12 psf REINF. SEE DETAIL 1.
- ADD FRP AT BOUNDARY ELEMENT. SEE DETAIL 8.
- ADD FRP AT BOUNDARY ELEMENT. SEE DETAIL 9.
- ADD FRP AT BOUNDARY ELEMENT. SIM. TO DETAIL 8 & 9.
- ADD FRP AT BOUNDARY ELEMENT. SIM. TO DETAIL 8 & 9.
- THICKEN WALL 6"-8" w/ 12 psf REINF. SEE DETAIL 1.
- THICKEN WALL 12" w/ 16 psf REINF. SEE DETAIL 2.
- THICKEN WALL 12" w/ 16 psf REINF. SEE DETAIL 2.
- ADD FRP AT BOUNDARY ELEMENT. SIM. TO DETAIL 8 & 9.
- ADD 12" WALL w/ 16 psf REINF. SEE DETAIL 2.
- Add collector reinforcement. See detail B/S-30.
- Add chord reinforcement. See detail C/S-37.
- Add collector reinforcement. See detail B/S-16.
- Add collector reinforcement. See detail E/S-37.
- TYPICAL AT ALL CONCRETE COLUMNS. PROVIDE FRP. SEE DETAIL 4.
- EXISTING BLDG FLR. EL. 722.33'

KEY PLAN

Title block:
FOURTH FLOOR FRAMING PLAN
DRAWN BY / CHECKED / DATE 12.11.67 / PROJECT No. 66-28
SHEET S-6

PALOMAR MEMORIAL HOSPITAL

THE NORTHERN SAN DIEGO COUNTY HOSPITAL DISTRICT • ESCONDIDO CALIFORNIA

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FIFTH FLOOR FRAMING PLAN

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

AND ABOVE

NOTES:
1. TOP OF SLAB ELEVATION 737.35'
2. SEE SHEET S-16 FOR JOIST SCHEDULE
3. SEE SHEET S-17 FOR SLAB SCHEDULE
4. SEE SHEETS S-16,17 FOR BEAM SCHEDULE
5. SEE SHEET S-17 FOR COLUMN SCHEDULE

△ DENOTES PRECAST PANEL NUMBER. SEE SH S-21 & S.22

Annotations (yellow callouts):

- W2 DECK w/
  • 3.5" HARDROCK CONC. (6.5" TOTAL DEPTH)
  • 1 PSF. REINF. AT CONC. TOPPING
  • MIN 3/4"ø x 4" LONG NELSON STUDS @ 12" o.c. ALONG EACH STEEL BEAM
- New balconies with steel framing
- TYPICAL SEE DETAIL 10
- TYPICAL AT EACH LOCATION SIM. DETAIL 10
- Remove concrete precast panels, from all sides of the tower.
- ADD FRP AT BOUNDARY ELEMENT. SEE DETAIL 8.
- ADD FRP AT BOUNDARY ELEMENT. SIM. TO DETAIL 8 & 9.
- ADD 12" WALL w/ 16 psf REINF. SEE DETAIL 2.
- THICKEN WALL 6"-8" w/ 12 psf REINF. SEE DETAIL 1.
- THICKEN WALL 12" w/ 16 psf REINF. SEE DETAIL 2.
- ADD FRP AT BOUNDARY ELEMENT. SIM. TO DETAIL 8 & 9.
- Add collector reinforcement. See detail E/S-37.
- Add chord reinforcement. See detail C/S-37.
- Add collector reinforcement. See detail B/S-30.
- Add collector reinforcement. See detail B/S-16.
- THICKEN WALL 12" w/ 16 psf REINF. SEE DETAIL 2.
- TYPICAL AT ALL CONCRETE COLUMNS. PROVIDE FRP. SEE DETAIL 4.
- ADD FRP AT BOUNDARY ELEMENT. SEE DETAIL 9.
- THICKEN WALL 6" w/ 12 psf REINF. SEE DETAIL 1.
- SAW CUT EXIST EAVES
- EXISTING BUILDING ROOF BELOW
- START ORNAMENTAL REVEAL AT CORNER 6" BELOW EXIST EAVE (TYPICAL)
- FRP OVERLAY
- PRECAST PANEL

W10x19 (repeated, top and bottom framing members)

Overall dimension: 184'-2"
Grid spacings: 19'-0", 10'-0", 37'-0"
Vertical dimensions: 27'-0", 26'-6", 27'-5"

Title Block
FIFTH FLOOR FRAMING PLAN
S-7

DRAWN BY: S.B.
CHECKED: S.B.
DATE: 12.11.67
PROJECT No. 66-76
FRANK L. HOPE & ASSOCIATES
FRANK L. HOPE JR. REGISTERED ARCHITECT

KEY PLAN

DETAIL 1

SECTION A-A

6" THK (MIN.) CAST-IN-PLACE CONCRETE OR SHOTCRETE SHEAR WALL. AFFIX TO (E)CONCRETE WALL (f'c = 5,000 psi) REINF. PER PLAN

DOWELS SIZE & SPACING TO MATCH VERTICALS

(E)CONC. SLAB

CLASS B

CLASS B

(E) CONCRETE WALL

6" THK (MIN.) CAST-IN-PLACE CONCRETE OR SHOTCRETE SHEAR WALL. AFFIX TO (E)CONCRETE WALL (f'c = 5,000 psi) REINF. PER PLAN

#5@12 DOWELS EA. WAY DRILL AND SET w/ HILTI RE500-SD EPOXY 6" EMBED

PLAN

SEE PLAN

DOWEL BARS

VERTICAL BARS PER PLAN

A ← → A

HORIZONTAL BARS PER PLAN

(E)CONC. WALL

1 1/2"CLR. TYP.

NOTES
1. CLEAN AND ROUGHEN SURFACE OF EXISTING CONCRETE TO AMPLITUDE OF 1/8" WHERE NEW CONSTRUCTION ABUTS EXISTING.
2. ALL EPOXY DOWELS SHALL BE HILTI RE-500SD.
3. DO NOT CUT EXISTING REBAR FROM DRILLING, NO EXCEPTIONS.

DETAIL 2

SECTION B-B

12" THK CAST-IN-PLACE CONCRETE OR SHOTCRETE SHEAR WALL. AFFIX TO (E)CONCRETE WALL (f'c = 5,000 psi) REINF. PER PLAN

DOWELS SIZE & SPACING TO MATCH VERTICALS

(E)CONC. SLAB

CLASS B

CLASS B

(E) CONCRETE WALL

6" THK (MIN.) CAST-IN-PLACE CONCRETE OR SHOTCRETE SHEAR WALL. AFFIX TO (E)CONCRETE WALL (f'c = 5,000 psi) REINF. PER PLAN

#5@12 DOWELS EA. WAY DRILL AND SET w/ HILTI RE500-SD EPOXY 8" EMBED

PLAN

SEE PLAN

DOWEL BARS

VERTICAL BARS PER PLAN

A ← → B

HORIZONTAL BARS PER PLAN

(E)CONC. WALL

1 1/2"CLR. TYP.

NOTES
1. CLEAN AND ROUGHEN SURFACE OF EXISTING CONCRETE TO AMPLITUDE OF 1/8" WHERE NEW CONSTRUCTION ABUTS EXISTING.
2. ALL EPOXY DOWELS SHALL BE HILTI RE-500SD.
3. DO NOT CUT EXISTING REBAR FROM DRILLING, NO EXCEPTIONS.

DETAIL 3

(E)CONC. COLUMN PER PLAN

(N)COLUMN STRENGTHENING WHERE OCCURS PER PLAN

(N)CONC. (f'c = 5,000 psi) w/ #7@12" E.W. AROUND (E) FOOTING

TYPICAL #5@12" EA. WAY 12" EMBED w/ 90° STD. HOOK

SAND BLAST (E)SURFACE FINISH

1" CLR COVER TYP.

6" TYP.

SLAB ON GRADE

TYPICAL #9@12T&B w/ 90° STD. HOOK

TYPICAL #9@12T&B w/ 90° STD. HOOK

18"

3" MIN. TYP.

(E)FOOTING

PER PLAN TYPICAL U.N.O.

BOTTOM OF FOOTING TO MATCH (E)FOOTING

NOTES:
1. DO NOT CUT EXISITING REINFORCEMENT
2. PROVIDE 8" MIN. EMBEDMENT FOR REBAR IN EPOXY INTO EXISTING FOOTING U.N.O.
3. ALL EPOXY DOWELS SHALL BE HILTI RE500-SD EPOXY.

EXISTING CONCRETE FOUNDATION STRENGTHENING DETAIL ③
3/4"=1'-0"

DETAIL 4

Recommended Carbon Fiber Wrapping of Existing Columns to Increase Confinement (Conceptual)

VARIES

15'-0"

4'-6"

4'-6"

4'-6"

1/2" MAX. GAP TYP.

(E)COLUMN

3 LAYERS (0.15") TYFO SEH SYSTEM AS PER ICBO ER-5282

(E)SLAB

ELEVATION

6" MIN. OVER LAP

24"

24"

3/4" MIN. RADIUS ON ALL EDGES.

SECTION A-A

GENERAL NOTES:

1. ONLY FYFE CO. LLC TRAINED AND CERTIFIED APPLICATORS SHALL INSTALL THE TYFO PRODUCTS. CONTACT FYFE CO. LLC FOR A LIST OF APPROVED APPLICATORS (T: 619-642-0694).
2. PROVIDE 1" (±0.25") RADIUS ON ALL COLUMN EDGES BY EITHER GRINDING OR APPLYING TYFO WS EPOXY COVING BY MEANS OF TROWELLING. TYFO WS TO CURE FOR A MINIMUM OF 12 HOURS BEFORE INSTALLING THE TYFO SEH SYSTEM.
3. BROOM CLEAR COLUMN SURFACE.
4. APPLY A PRIME COAT OF TYFO WS EPOXY.
5. APPLY TYFO SEH SYSTEM PER MANUFACTURER'S SPECIFICATIONS.
6. APPLY ONE PRIME COAT OF TYFO A PAINT.
7. PROVIDE SPECIAL INSPECTION DURING INSTALLATION IN ACCORDANCE WITH SECTION 2.6 OF ICBO REPORT ER 5282
8. COMPLETE WORKING DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR EACH INSTALATION OF THE SYSTEM.

DETAIL 5

CLASS B

TYPICAL #5@12 EA. WAY
w/ 90° STD. HOOK w/12" EMBED

#7@12 EACH SIDE

SLAB ON GRADE

CLASS B

SAND BLAST
(E)SURFACE FINISH

6"
TYP.

GROUND FLOOR

TYPICAL
#7@12 DOWELS

TYPICAL
#9@12 T&B
DRILL AND SET USING
HILTI RE500-SD EPOXY
w/18" EMBED

TYPICAL
MATCH WALL VERTICALS
DRILL AND SET
USING HILTI RE500-SD
EXPOXY w/ 18" EMBED

#9@12 EACH SIDE

(N)FOUNDATION
STRENGTHENING
PER PLAN

PER PLAN
TYP.

(E)FOOTING
PER PLAN

BOTTOM OF FOOTING
TO MATCH (E)FOOTING

NOTES
1. DO NOT CUT EXISTING REBAR FROM DRILLING, NO EXCEPTIONS.
2. ALL EPOXY DOWELS SHALL BE HILTI RE-500SD.
3. FOR BALANCE OF INFORMATION SEE 2/PS601.

EXISTING WALL FOUNDATION STRENGTHENING SECTION 5
1/2"=1'-0"

DETAIL 6

CLASS B

TYPICAL #5@12 EA. WAY
w/ 90° STD. HOOK w/12" EMBED

#9@6 EACH SIDE

SLAB ON GRADE

CLASS B

SAND BLAST
(E)SURFACE FINISH

6"
TYP.

GROUND FLOOR

TYPICAL
#7@12 DOWELS

TYPICAL
#11@8 T&B
DRILL AND SET USING
HILTI RE500-SD EPOXY
w/ 18" EMBED

TYPICAL
MATCH WALL VERTICALS
DRILL AND SET
USING HILTI RE500-SD
EXPOXY w/ 18" EMBED

#11@8 EACH SIDE

(N)FOUNDATION
STRENGTHENING
PER PLAN

PER PLAN
TYP.

(E)FOOTING
PER PLAN

BOTTOM OF FOOTING
TO MATCH (E)FOOTING
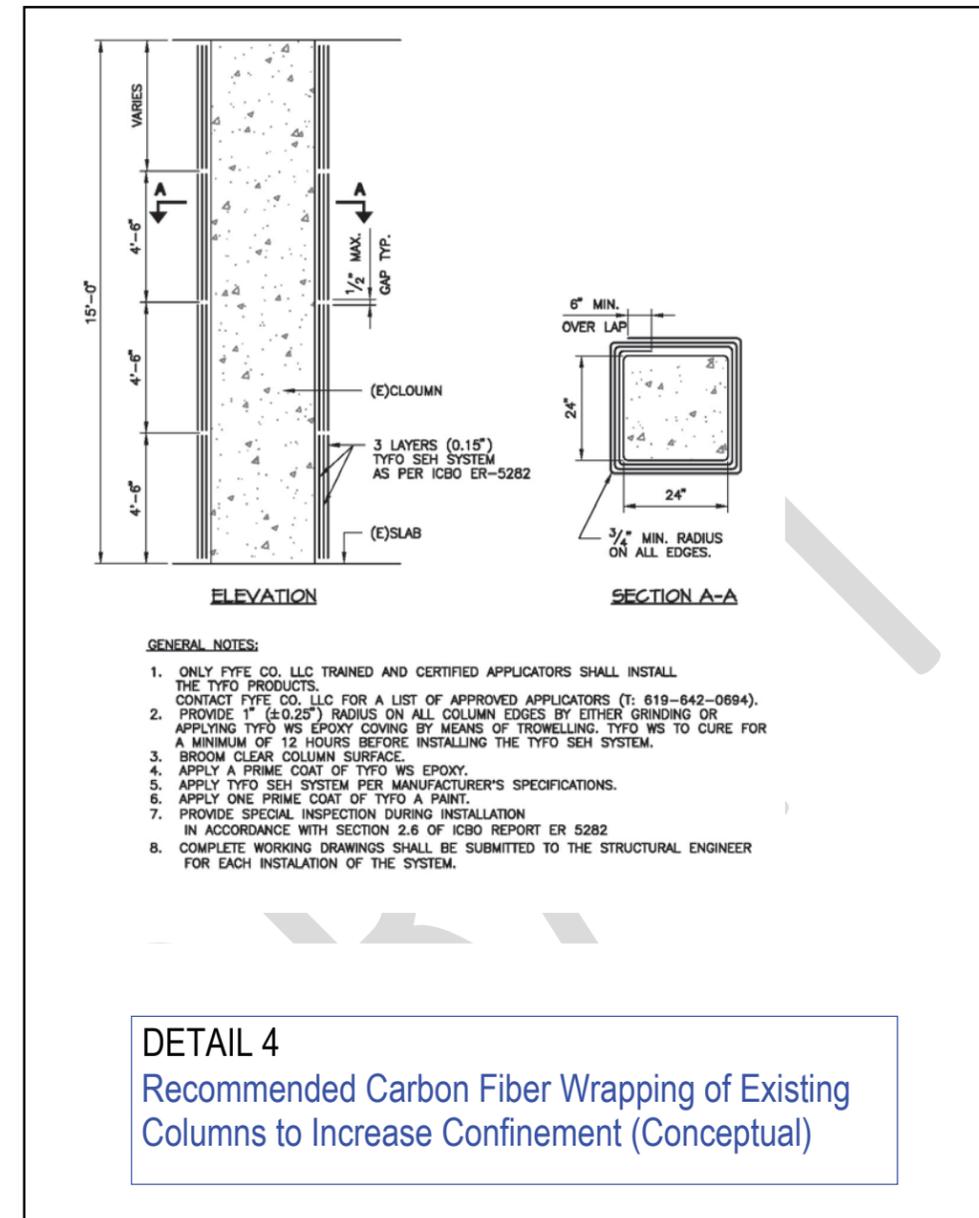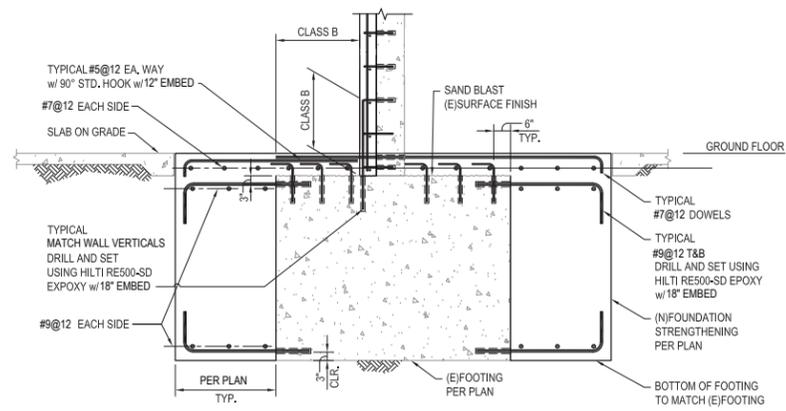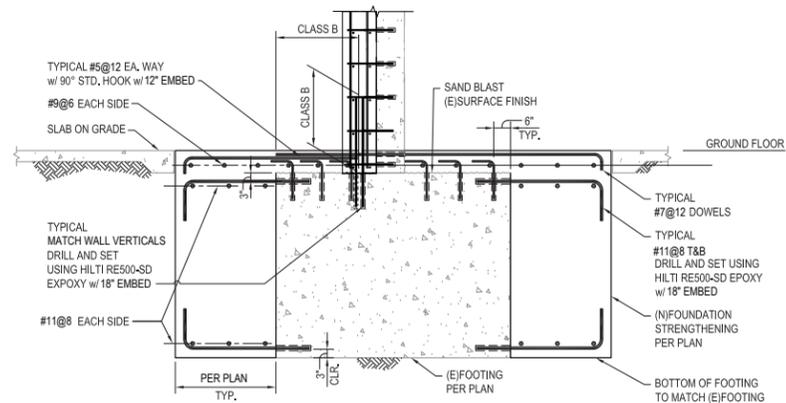
NOTES
1. DO NOT CUT EXISTING REBAR FROM DRILLING, NO EXCEPTIONS.
2. ALL EPOXY DOWELS SHALL BE HILTI RE-500SD.
3. FOR BALANCE OF INFORMATION SEE 2/PS601.

EXISTING WALL FOUNDATION STRENGTHENING SECTION 6
1/2"=1'-0"

DETAIL 7

CLASS B

TYPICAL #5@12 EA. WAY
w/ 90° STD. HOOK w/12" EMBED

#9@6 EACH SIDE

SLAB ON GRADE

CLASS B

SAND BLAST
(E)SURFACE FINISH

6"
TYP.

GROUND FLOOR

TYPICAL
#7@12 DOWELS

TYPICAL
#11@8 T&B
DRILL AND SET USING
HILTI RE500-SD EPOXY
w/ 18" EMBED

TYPICAL
MATCH WALL VERTICALS
DRILL AND SET
USING HILTI RE500-SD
EXPOXY w/ 18" EMBED

#11@8 EACH SIDE

(N)FOUNDATION
STRENGTHENING
PER PLAN

PER PLAN
TYP.

(E)FOOTING
PER PLAN

BOTTOM OF FOOTING
TO MATCH (E)FOOTING

DRILL THRU
#8@8" o.c.

NOTES
1. DO NOT CUT EXISTING REBAR FROM DRILLING, NO EXCEPTIONS.
2. ALL EPOXY DOWELS SHALL BE HILTI RE-500SD.
3. FOR BALANCE OF INFORMATION SEE 2/PS601.

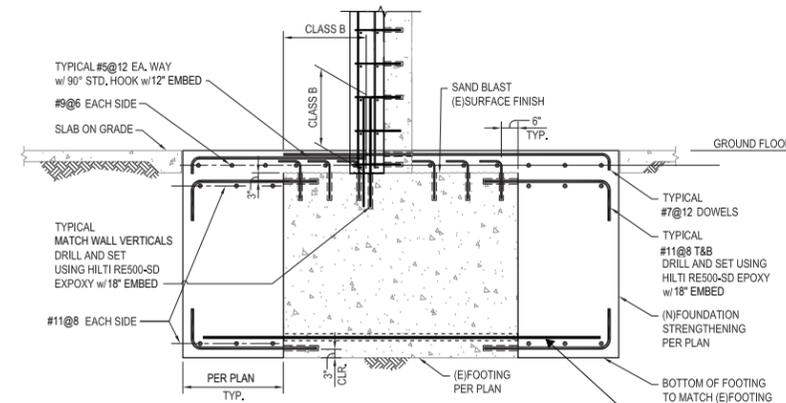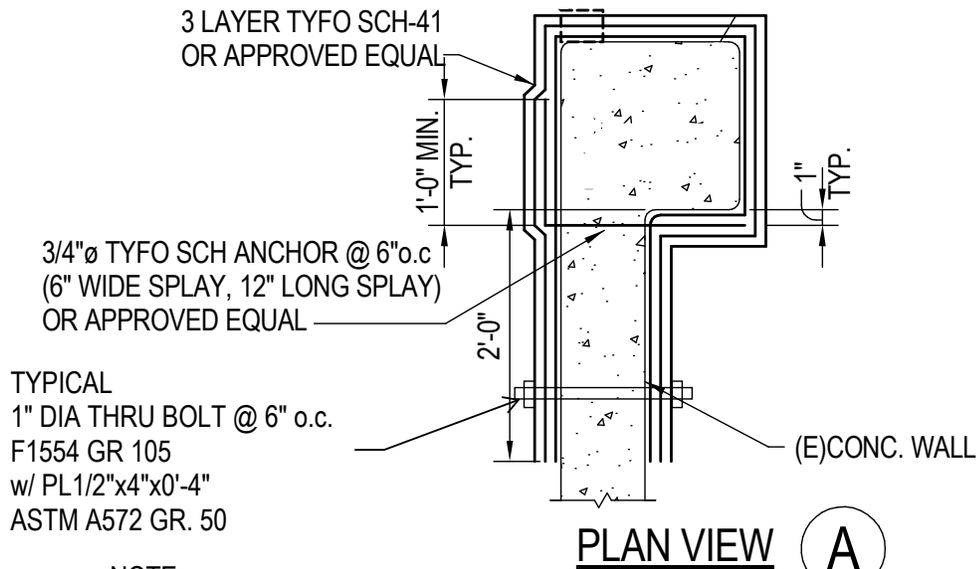EXISTING WALL FOUNDATION STRENGTHENING SECTION 7
1/2"=1'-0"

3 LAYER TYFO SCH-41
OR APPROVED EQUAL

1'-0" MIN. TYP.

1" TYP.

3/4"ø TYFO SCH ANCHOR @ 6"o.c
(6" WIDE SPLAY, 12" LONG SPLAY)
OR APPROVED EQUAL

2'-0"

TYPICAL
1" DIA THRU BOLT @ 6" o.c.
F1554 GR 105
w/ PL1/2"x4"x0'-4"
ASTM A572 GR. 50

(E)CONC. WALL

PLAN VIEW (A)

NOTE:
1. WHERE FRP OCCURS, ROUND CORNERS WITH 1" MINIMUM RADIUS, 1" MINIMUM COVING
   RADIUS AT REENTRANT CORNERS.
2. BACKFILL ANCHOR HOLES WITH EPOXY.

TYPICAL SHEAR WALL JAMB
FRP WRAP DETAIL   (8)

DETAIL 8
Recommended Carbon Fiber Wrapping at Existing
Wall Jambs to Increase Confinement (Conceptual)

3 LAYER TYFO SCH-41
OR APPROVED EQUAL

2'-0"

TYPICAL
1" DIA THRU BOLT @ 6" o.c.
F1554 GR 105
w/ PL1/2"x4"x0'-4"
ASTM A572 GR. 50
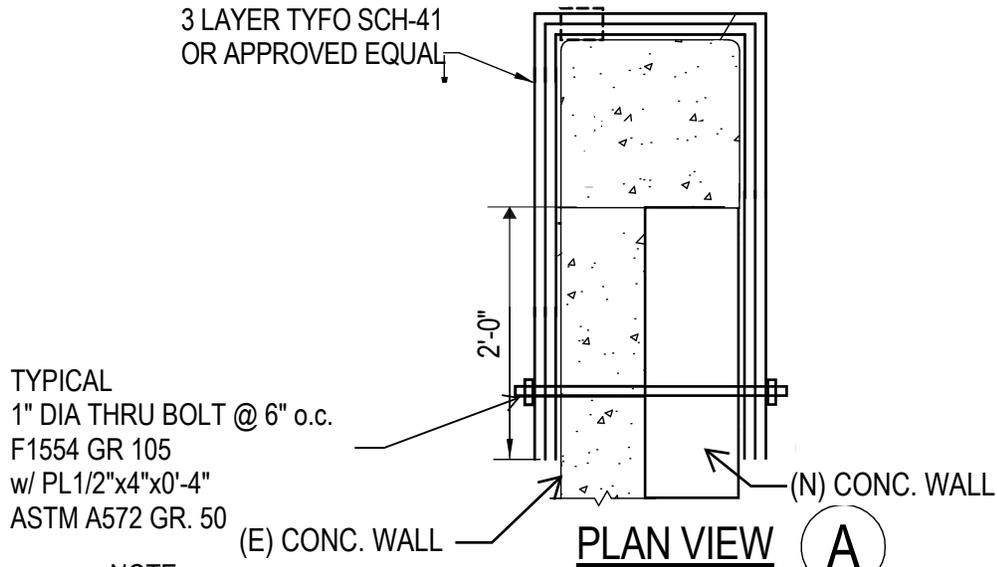
(N) CONC. WALL

(E) CONC. WALL

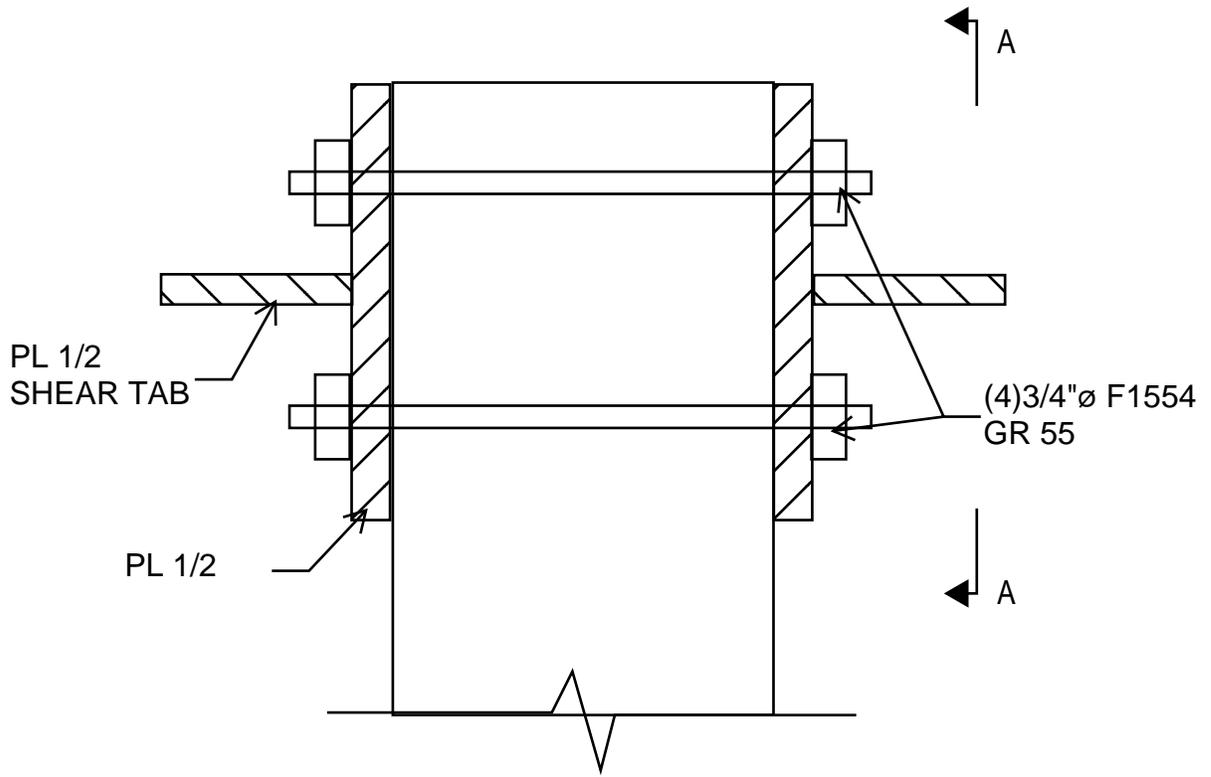PLAN VIEW (A)

NOTE:
1. WHERE FRP OCCURS, ROUND CORNERS WITH 1" MINIMUM RADIUS, 1" MINIMUM COVING
   RADIUS AT REENTRANT CORNERS.
2. BACKFILL ANCHOR HOLES WITH EPOXY.
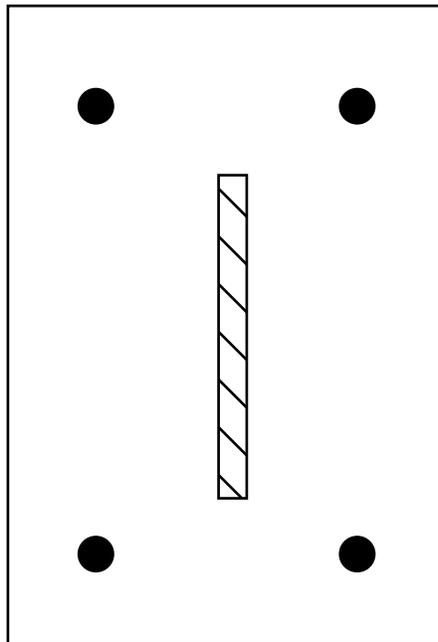
TYPICAL SHEAR WALL JAMB
FRP WRAP DETAIL (9)

DETAIL 9
Recommended Carbon Fiber Wrapping at Existing
Wall Jambs to Increase Confinement (Conceptual)

PL 1/2
SHEAR TAB

PL 1/2

(4)3/4"ø F1554
GR 55

PLAN VIEW

SECTION A-A

DETAIL 10

TYPICAL JOIST REINF'

SECTION ⬭ 5-16 B

SLAB MESH 6'×6'-9/9(TYP)

WHERE 2 TOP BARS SHOWN

(4)#9 CONT.

#4@6

SPRAY ⅜" MONO-NOTE' OR EQUAL ON BOTTOM OF JOIST SLAB TYP.

DRILL & EPOXY

WHERE COLLECTOR IS ADDED AT JOIST

SECTION ⬭ S30 D

2 alternate retrofits

DRILL & EPOXY

6×6-9/9 MESH

(6)#9 CONT.

#4@6

REINF. SEE BEAM SCHED.

SEE SCHEDULE

JOIST BARS SEE SCHED

#4@6

(6)#9 CONTINUOUS

SECTION ⬭ S37 E

5'-6"   8'

1'-0" × 4'-0' COL.

JOIST BARS

#3 @ 12 @ 12' O.C.

FOR REINF SEE JOIST SCHEDULE

DRILL & EPOXY

#3 @ 12'

(4)#9 CONT.

1-#3

#4@6

FOR REINF SEE BEAM SCHEDULE.

3'-0"   10'   2'-0"   30" PAN   5½   30' PAN.

SECTION ⬭ S37 C

5'-6"   8'

1'-0" × 4'-0' COL.

FOR JOIST BARS SEE SCHEDULE

DRILL & EPOXY

FOR REINF SEE BEAM SCHEDULE

(2)#9 CONT.

#4@6

6'   4'   4'   10'