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Desert Regional Medical Center Retrofit Project Phase 1

Desert Regional Medical Center
Palm Spring, CA
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SGH Project 187112

SIMPSON GUMPERTZ & HEGER
Engineering of Structures and Building Enclosures

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1. INTRODUCTION

The Desert Healthcare District (DHD) commissioned Simpson Gumpertz & Heger Inc. (SGH) to evaluate the Desert Regional Medical Center (DRMC) to gain a more detailed understanding of potential design and construction work associated with attaining compliance with the Alquist Hospital Seismic Safety Act (AHSSA, aka SB 1953). This report is a compilation of the work completed under Phase 1 of the referenced project and builds upon the information presented in the Phase 0 report.

1.1 Background

The Alquist Hospital Seismic Safety Act (AHSSA aka SB1953) was established in 1995 in response to unexpected poor seismic performance of hospitals during the 1994 Northridge earthquake. The AHSSA requires that all General Acute Care (GAC) hospital buildings comply with certain building code regulations by 1 January 2030. This requirement is intended to provide higher confidence that a building will retain a high level of functional recovery following a major earthquake. The 1995 California Building Code, Title 24 (CBC), with a few specific modifications, was designated the target building code regulations for attaining acceptable performance. Specific Structural Performance Category (SPC) and Nonstructural Performance Category (NPC) definitions primarily establish a common vocabulary for stakeholders, design professionals, contractors and the California Office of Statewide Health Planning and Development (OSHPD).

The original AHSSA regulations require buildings rated SPC 2 or NPC 2 comply with SPC 5 and NPC 4 by 1 January 2030. Because of the compliance timelines associated with the AHSSA, SPC 1 buildings and NPC 1 buildings are currently not a concern at many medical centers in California, including the DRMC, which does not have any SPC 1 or NPC 1 buildings. SPC 2 through SPC 4 and NPC 2 through NPC 4 are performance categories applicable to the DRMC. The introduction of DRMC compliance with AHSSA and related standards is described in the Phase 0 report, so it is not repeated here.

The DRMC comprises twenty independent buildings with approximately 550,000 sq ft of occupiable space. Seventeen of the twenty buildings were designed and constructed under a permit led by the California State Office of Statewide Health Planning and Development (OSHPD), which typically minimizes the need for seismic retrofit construction. However, these “compliant” buildings require engineering consulting to confirm compliance with nonstructural seismic performance regulations. Phase 0 results describe the existing status of the DRMC,

general compliance with the AHSSA today and the defined scope of work, schedule and fee for our work in Phase 1.

1.2 Objectives

Based on Phase 0 findings, SGH's Phase 1 objective is to develop actionable structural retrofit strategies for three Structural Performance Category (SPC) 2 buildings, including the development of a rough order of magnitude cost for the related construction. Additionally, our Phase 1 work describes the scope of engineering work and estimated professional fees associated with developing nonstructural evaluation reports and construction documents to attain Nonstructural Category (NPC) 4 compliance for twenty buildings at the DRMC. Phase 1 also includes a cost model appropriate for estimating potential construction costs to bring twenty buildings into compliance with NPC 4 requirements.

1.3 Existing Buildings

The DRMC comprises twenty structurally separated buildings. The SPC/NPC ratings, posted by OSHPD and listed below, are confirmed per our review of the documents listed above.

Table 1: Existing Buildings and SPC/NPC Ratings

Building Number	OSHPD Building Number	Building Name	SPC	NPC
1	BLD-01393	Main Hospital & Additions	2	2
2	BLD-02932	East Tower	2	2
3	BLD-01395	Woman & Infants Hospital	3	2
4	BLD-01396	North Wing	2	2
5	BLD-01397	Central Plant	4	2
6	BLD-01398	Shipping/Receiving	4	2
7	BLD-01399	Surgery Wing	4	2
8	BLD-01400	West Tower (Sinatra Tower)	3	2
8A	BLD-03720	West Tower Corridor 1	3	2
8B	BLD-03721	West Tower Corridor 2	3	2
8C	BLD-03722	West Tower Corridor 3	3	2
8D	BLD-03723	West Tower Corridor 4	3	2
8E	BLD-03725	West Tower Corridor 5	3	2
9	BLD-01401	Lobby	3	2
10	BLD-01402	Admitting	4	2
11	BLD-01403	Elevator Tower	4	2
11.1	BLD-03764	Elevator Tower Corridor 1	3	2
11.2	BLD-03765	Elevator Tower Corridor 2	3	2
12	BLD-01404	Dinah Shore Waiting Area	3	2
13	BLD-03741	Medical Records Building	3	2

Buildings rated SPC 3, SPC 4 or SPC 5 may continue to function as a General Acute Care (GAC) building beyond 1 January 2030 without retrofit or analytical validation. Buildings rated SPC 2 must be analyzed and or retrofit to confirm compliance with SPC 4D before 1 January 2030.

Buildings rated NPC 2 must be evaluated to establish a record of existing conditions and required scope of work to bring the building into compliance with NPC 4.

1.4 Scope of Work

To complete the Phase 1 objectives, SGH performed the following scopes of work:

1. Per the AHSSA, a structural analysis using the *Seismic Evaluation and Retrofit of Existing Buildings*, ASCE 41-17, Damage Control performance level. SGH used the linear elastic analysis method with United States Geological Survey (USGS) based seismic design factors for:

   - Main Hospital & Additions (Building 1).
   - East Tower (Building 2).

- North Wing (Building 4).

2. Work with Swinerton Builders (Swinerton) to develop a conceptual cost estimate for seismic retrofit concepts based on evaluation results described in Item 1.

3. Identify and describe scopes of work and estimated fee for developing nonstructural evaluation reports and construction documents for buildings that are rated NPC 2, but require only fire sprinkler bracing to achieve NPC 4 (based on Phase 0 results).

4. Identify and describe scopes of work and estimated fee for developing nonstructural evaluation reports and construction documents for buildings that are rated NPC 2 and were designed between 1973 and 1983, with construction documents that show details of equipment/systems bracing and anchorage (based on Phase 0 results).

5. Identify and describe scopes of work and estimated fee for developing nonstructural evaluation reports and construction documents for buildings that are rated NPC 2 and designed before 1973 (based on Phase 0 results).

6. Work with Swinerton to develop a representative cost model and strategy for executing archetypical construction activities associated with the identified scopes of work for each building as described in the construction document scopes of work.

7. Develop presentation materials for DHD.

8. Develop written documents describing scope of work and estimated fees for consulting, OSHPD review and potential construction cost, including phasing and sequencing for scope of work described in Items 1-6.

2. DOCUMENT REVIEW

2.1 Construction Drawings

- Architectural, Electrical, HVAC, Plumbing and Structural drawings for the General Hospital Building dated 24 May 1950.

- Architectural, Electrical, HVAC, Plumbing and Structural drawings for Alterations & Additions to the Desert Hospital dated 5 March 1956.

- Architectural and Structural drawings for Alterations & Additions to the Desert Hospital dated 1 August 1962.

- Architectural, Electrical, Mechanical, Plumbing and Structural drawings for A-B-C Wings Remodel dated 10 February 1971.

- Electrical, Mechanical, Plumbing and Structural drawings for Desert Hospital dated February 1967 (East Tower drawings).

- Architectural, Electrical, Mechanical, Plumbing and Structural drawings for Desert Hospital Phase I Expansion dated 24 July 1991 (Women and Infants drawings).

- Architectural, Civil, Electrical, Mechanical, Plumbing and Structural drawings for Additions & Alterations to Desert Hospital Diagnostic & Treatment Center dated March 1971 (North Wing drawings).

- Architectural, Electrical, Mechanical, Plumbing and Structural drawings for Central Power Plant for Desert Hospital dated 30 October 1974.

- Architectural, Electrical, Mechanical, Plumbing and Structural drawings for Desert Hospital – Palm Springs Phase 1 Addition 'Revised' dated 4 February 1977.

2.2 Codes and Standards

- 2016 California Existing Building Code (CEBC).

- American Society of Civil Engineers (ASCE); ASCE 41-17, Seismic Evaluation and Retrofit of Existing Buildings.

- American Concrete Institute (ACI); ACI 318-14, Building Code Requirements for Structural Concrete.

- American Institute of Steel Construction (AISC); AISC 360, Specifications for Structural Steel Buildings.

- American Wood Council (AWC); NDS 2015, National Design Specification for Wood Construction.

2.3 Information Provided by Others

Mr. John T. Greenwood of Prest Vuksic Architects (PVA) provided documents that inform completed, OSHPD reviewed, projects in the subject buildings and a description of the scopes of work completed as part of these projects. This data was used to develop cost models for work associated with attaining nonstructural seismic compliance. The referenced documents are listed below:

- Project Index dated November 28, 2018 (7 pages).

- Annotated architectural plans identified "PVA Mark Up 11-28-18", S-200 through S-206.

- Architectural plans (departments identified).

- Architectural, Electrical, Mechanical, Plumbing and Structural drawings for Desert Hospital Phase I Expansion dated 24 July 1991 (Women and Infants drawings).

Mr. John Austin of Swinerton Builders (Swinerton) developed construction cost estimates for conceptual seismic retrofit and nonstructural compliance retrofit work associated with attaining compliance with the AHSSA. The referenced documents are listed below:

- Desert Regional Medical Center, Conceptual SPC 4 ROM Estimate Summary dated 14 December 2018.
- Desert Regional Medical Center, Conceptual SPC 4 ROM Estimate Floor by Floor Summary dated 14 December 2018.
- Desert Regional Medical Center, Conceptual NPC 4 ROM Estimate dated 19 December 2018.

3. STRUCTURAL ANALYSIS/EVALUATION (SPC 4D)

SGH completed ASCE 41-17, Tier 2 Structural Seismic Evaluations for three buildings:

- Main Hospital & Additions (Building 1).
- East Tower (Building 2).
- North Wing (Building 4).

The linear elastic analysis method, using USGS based seismic design factors, was used to evaluate building performance for the following targets per regulatory requirements related to attaining SPC 4D promulgated in the California Building Code (CBC). The performance requirement required by the CBC/ASCE 41 indicate attaining two independent performance goals as described in the definition of Enhanced Performance Objectives.

CBC Chapter 34, Section 3412A.2.3.2 describes the requirements necessary to evaluate an existing building for compliance with SPC 4D using ASCE 41. Specifically, the section requires that the following criteria are met, in addition to confirming certain nonstructural elements meet performance targets.

- “Damage Control Structural Performance Level” at BSE-1E Hazard Level.
- “Collapse Prevention Structural Performance Level” at BSE-2E Hazard Level

The Damage Control Structural Performance Level (DC) is defined as a post-earthquake damage state between the Life Safety Structural Performance Level (LS) and the Immediate Occupancy Structural Performance Level (IO). ASCE 41 prescribes “Acceptance Criteria” associated with LS and IO; the DC Acceptance Criteria is determined by taking a value that is halfway between the values listed for LS and IO. BSE-1E is the seismic hazard level associated with the representative spectral response parameters of the seismic hazard having a 20% probability of exceedance in 50 years.

The Collapse Prevention Structural Performance Level (CP) is defined as a post-earthquake damage state in which a structure has damaged components and continues to support gravity loads but retains no margin against collapse. ASCE 41 prescribes "Acceptance Criteria" associated with CP. BSE-2E is the seismic hazard level associated with the representative spectral response parameters of the seismic hazard having a 5% probability of exceedance in 50 years.

We found that each building has structural deficiencies that prevent them from meeting the required objectives. We developed conceptual retrofits for these deficiencies and Swinerton Builders developed cost estimates for construction the retrofits (presented in later sections).

3.1 Main Hospital & Additions (Building 1)

3.1.1 Description of Existing Structural Systems

The Main Hospital & Additions building is a primarily a sprawling one-story structure, comprising 6 in. thick reinforced concrete walls, with a one-way concrete joist roof system. A second story was added over a portion of the building in 1967 and comprises structural steel framed space supported by the one-story reinforced concrete wall building.

3.1.2 Seismic Analysis

The seismic analysis for the Main Hospital & Additions follows the ASCE 41-17 criteria described above. The analysis identified three structural irregularities:

- In-Plane Discontinuity Irregularity; ASCE 41-17, Section 7.3.1.1.1
- Weak Story Irregularity; ASCE 41-17, Section 7.3.1.1.3
- Torsional Strength Irregularity; ASCE 41, Section 7.3.1.1.4

ASCE 41 does not allow using linear elastic analysis methods for structures with the identified irregularities, which means that future analyses and final retrofit designs should be performed using nonlinear procedures described in ASCE 41 chapter 7.

However, SGH used linear elastic methods to evaluate the building, considering the irregularities, by using a three-dimensional finite element model for the Main Hospital Building & Additions (using ETABS structural analysis software) to evaluate the seismic performance of the existing structure, understand the severity of the identified irregularities and develop a conceptual retrofit scheme that could be evaluated for cost estimating purposes. The model

comprises frame and thin-shell elements with stiffness modification factors as prescribed in ASCE 41.

The structural model comprises the Main Hospital building and all its additions, except the 1967 addition, which is modeled independently. The one-story portion is modeled as a contiguous single-story building with concrete walls and rigid roof diaphragm. The roof height varies at various locations within the model as identified in the record drawings. The elevated, steel framed 1967 addition comprises one additional floor and roof above the one-story building and is laterally supported by discontinuous steel-braced frames. Parts of the building also include a basement level, which is not modeled.

3.1.3 Roof and Floor Diaphragms

The roof of the one-story portion is a one-way concrete joist system connected directly to the vertical elements of the seismic force resisting system. The steel-framed portion comprises 3-1/4 in. light-weight concrete fills over a 24-gauge fluted metal deck at the floor level, and 2-3/4 in. Zonolite fill over a 26-gauge fluted metal deck at the roof level.

Linear analysis indicates that the roof diaphragms for the one-story structure and the floor diaphragm for the steel framed addition, have adequate strength to span to vertical seismic force resisting system elements of the proposed retrofit scheme. Elements of the steel framed addition roof diaphragm have low capacities and require strengthening to meet the targeted performance criteria.

3.1.4 Walls and Wall Connections

Analysis indicates that the irregularities in the existing structural system will have a detrimental effect on the building behavior in a seismic event. The reinforced concrete walls supporting the two-story steel framed addition will likely be overloaded during a seismic event, necessitating strengthening to meet the targeted performance goals.

Several concrete walls throughout the one-story structure are inadequate to resist prescribed seismic forces. The wall inadequacies include effects of the noted irregularities, inadequate connection of vertical additions to original walls, overloading associated with the two-story steel framed addition and numerous openings.

ASCE 41, Section 7.2.11 requires structural walls and their anchorages resist out-of-plane inertial forces. The connections of the roof and floor diaphragms to walls are adequate to resist prescribed out-of-plane inertial forces.

3.1.5 Concrete Columns and Wall Piers

Reinforced concrete columns and narrow wall piers frame the openings in interior and exterior walls at several locations throughout the one-story building. Most columns and wall piers are shear-critical, necessitating retrofit to meet the targeted performance goals.

3.1.6 Steel Braced Frames

Discontinuous steel braced frames laterally support the 1967 two-story steel framed addition to the Main Hospital building. The braced frame connections have inadequate strength to meet the targeted performance goals. The discontinuous braced frames represent a primary structural irregularity that adversely affects the existing structure's behavior in a seismic event.

Given the number and severity of deficiencies associated with the steel braced frames and their effects on the supporting structure, their replacement with a new seismic force resisting system will likely be more economically efficient than retrofitting the frame and adding supplement elements and foundations.

3.1.7 Foundations

New foundations are required to support new walls. Additional of concrete must be added to the existing footings below thickened walls. Most existing reinforced concrete foundations are adequate to resist prescribed forces and do not require retrofit to meet target performance goals.

3.2 East Tower (Building 2)

3.2.1 Description of Existing Structural Systems

The East Tower is a three-story pre-Northridge steel special moment frame (SMF) building, with reinforced concrete floor and roof slabs, supported by structural steel columns that elevate the second floor above the one-story building below. The structural steel columns are founded on reinforced concrete spread footings.

3.2.2 Seismic Analysis

The seismic analysis for the East Tower follows the ASCE 41-17 criteria described above. SGH evaluated the East Tower by using a three-dimensional linear elastic finite element model (using ETABS structural analysis software) to evaluate the seismic performance of the existing structure and develop a conceptual retrofit scheme that could be evaluated for cost estimating purposes. The model comprises frame and thin-shell elements with stiffness modification

factors as prescribed in ASCE 41. The structural model comprises four stories above a basement.

3.2.3 Roof and Floor Diaphragms

The roof and floor systems are one-way reinforced concrete slabs with slab thickness varying between 4 to 6 in. and supported on structural steel framing. The diaphragm at the first-floor level transfers seismic shear forces between the perimeter walls and the interior moment frames. Because of the low capacity of the floor element(s) at each level, the reinforced concrete slab, diaphragm chord, collectors and their connections are all deficiencies that require retrofit to meet target performance goals.

3.2.4 Steel Special Moment Frames

Beams associated with the special moment frames are inadequately braced at their bottom flanges. This condition requires mitigation to achieve the targeted performance objectives. Existing moment frame beam-column connections also lack the strength necessary to meet the target performance goals and require retrofit.

Analysis indicates that the column baseplates are deficient and must be retrofit to meet the targeted performance goals. Analysis also indicates that the SMF does not meet the OSHPD mandated story drift criteria at the second-floor level, requiring the addition of structural elements to stiffen the seismic force resisting at this level.

3.2.5 Walls and Wall Connections

The existing reinforced concrete walls are adequate to resist prescribed forces and do not require retrofit to meet target performance goals.

The connection between the reinforced concrete walls and roof/floor diaphragms comprises (2) #4 steel reinforcing dowels at 12 in. on-center. This connection has insufficient strength to resist prescribed in-plane shear forces, requiring retrofit.

ASCE 41, Section 7.2.11 requires structural walls and their anchorages adequately resist out-of-plane inertial forces. Our analysis of the walls and the connection to the roof and floor diaphragms shows that the walls and their anchorage are adequate to resist prescribed out-of-plane inertial forces.

3.2.6 Foundations

Analysis indicates that the existing spread footings supporting the moment frame columns cannot adequately resist the uplift forces transferred from the SMF columns when resisting seismic loads.

3.3 North Wing (Building 4)

3.3.1 Description of Existing Structural Systems

The North Wing comprises two levels, one story above ground and one story below ground. The exterior walls comprise 10 in. thick, two-wythe clay masonry above 10 in. thick reinforced concrete basement walls. The walls and three interior columns are supported on reinforced concrete shallow foundations below a 4 in. thick reinforced concrete slab-on-grade. The elevated floor slab comprises a 4.5 in. reinforced concrete one-way slab supported on reinforced concrete beams. The 2.25 in. light-weight concrete over metal deck roof is supported on structural steel beams and steel posts.

3.3.2 Seismic Analysis

The North Wing seismic analysis follows ASCE 41-17 criteria described above. The analysis identified two structural irregularities:

- Out-of-Plane Discontinuity; ASCE 41-17, Section 7.3.1.1.2
- Torsional Strength Irregularity; ASCE 41, Section 7.3.1.1.4

ASCE 41 does not allow using linear elastic analysis methods for structures with the identified irregularities, which means that future analyses and final retrofit designs should be performed using nonlinear procedures described in ASCE 41 Chapter 7.

However, SGH used linear elastic methods to evaluate the building, considering the irregularities, by using two, three-dimensional finite element models (using ETABS structural engineering software) to develop a conceptual retrofit scheme that could be evaluated for cost estimating purposes. Each model comprises frame and thin-shell elements with stiffness modification factors as prescribed in ASCE 41. The models can be described as:

- Two-story model including roof level with masonry walls and main level with concrete walls.
- Single-story model with roof level and masonry walls only.

The two-story model provides results specific to the structural response considering the identified deficiencies, while the single-story model captures the effects of building behavior when founded partially below grade. Enveloped results describe the largest force demands on the seismic force resisting system, which provide a reasonable estimate for developing conceptual retrofit solutions.

3.3.3 Roof and Floor Diaphragms

The roof system has a 2.5 ft step along the southern elevation, north of the interface between Building 1 and Building 4. Both roofs comprise 2-1/4 in. light-weight insulating concrete fill over a 24-gauge fluted metal deck that is not directly connected to the vertical elements of the seismic force resisting system. Because of the step in the roof diaphragm, and the low capacity of the roof element(s), the analysis indicates that the roof metal deck, diaphragm chord connections and shear transfer from roof diaphragm to columns are all deficiencies that require mitigation. The first-floor diaphragm has adequate strength to span to vertical seismic force resisting system elements (walls) and transfer forces between the diaphragm and walls.

3.3.4 Walls and Wall Connections

The reinforced masonry and reinforced concrete walls are adequate to resist prescribed in-plane shear forces and do not require retrofit to meet target performance goals.

The connection between the reinforced masonry walls and roof/floor diaphragms comprises #5 steel reinforcing dowels at 32 in. on-center. This connection has insufficient strength to resist prescribed forces, requiring retrofit.

ASCE 41, Section 7.2.11 requires structural walls and their anchorages adequately resist out-of-plane inertial forces. Our analysis of the walls and the connection to the roof and floor diaphragms shows that the connections are adequate to resist prescribed out-of-plane inertial forces.

3.3.5 Foundations

The reinforced concrete foundations are adequate to resist prescribed forces and do not require retrofit to meet target performance goals.

4. STRUCTURAL RETROFIT (SPC 4D)

4.1 Main Hospital & Additions (Building 1)

4.1.1 Description of Identified Deficiencies Requiring Retrofit

The following deficiencies were identified in the structural analysis/evaluation for SPC 4D. Following the description of each deficiency is a brief description of the proposed retrofit:

1. Walls and wall connections

    - Deficiency: Several walls lack the strength necessary to resist forces transferred from the elevated steel addition. Other walls are overloaded because of irregularities and numerous openings in the existing structure.
    - Retrofit: Increase the thickness of the deficient walls. Dowel a section of concrete on to the face of existing walls, diaphragms, and foundations.

2. Concrete columns and wall piers

    - Deficiency: Shear critical columns frame interior and exterior openings.
    - Retrofit: Add layers of fiber-reinforced polymer to increase the shear strength of columns and slender wall piers.

3. Steel braced frames

    - Deficiency: Welded connection at the top and bottom of braces lack the strength necessary to meet the target performance objectives.
    - Retrofit: Replace the existing braced frame system with reinforced concrete walls.

4. Foundations

    - Deficiency: Existing foundations lack the strength necessary to support the retrofitted walls. New walls also require new footings.
    - Retrofit: Cast and dowel new reinforced concrete footings around the existing footings. Cast new footings underneath the new walls.

4.1.2 Main Hospital & Additions Conceptual Construction Cost Estimate

Swinerton developed a conceptual cost estimate for the proposed retrofit elements described in Section 4.1.1. The estimated direct cost for the Main Hospital & Additions seismic retrofit is $30,564,082 and the estimated cost, including normal extra contractor general conditions, general requirements, insurance and fees, 10% contingency and 20% escalation, is $50,237,006. All cost estimates are provided for reference in Appendix A.

4.2 East Tower (Building 2)

4.2.1 Description of Identified Deficiencies Requiring Retrofit

The following deficiencies were identified in the structural analysis/evaluation for SPC 4D. Following the description of each deficiency is a brief description of the proposed retrofit:

1. Chord and collector connections

    - Deficiency: The chords and collectors at the first floor are insufficient to resist diaphragm seismic forces and transfer loads into the basement walls.
    - Retrofit: This deficiency is mitigated by the addition of new walls between the second floor and foundation levels.

2. Steel special moment frame beams

    - Deficiency: The special moment frame beams are inadequately braced at their bottom flanges.
    - Retrofit: Brace the bottom flange using gusset plates and braces.

3. Steel special moment frame connections

    - Deficiency: Some special moment frame connections lack adequate strength to meet the target performance goals.
    - Retrofit: Reinforce existing connections with supplemental flange plates.

4. Story drift

    - Deficiency: Story drift at the second-floor level exceeds the acceptance criteria.
    - Retrofit: Add walls between the second-floor and foundation levels to stiffen the base of the structure and reduce story drift at the second-floor level.

5. Foundations

    - Deficiency: Inadequate uplift capacity for tensile loads in moment frame columns.
    - Retrofit: Add reinforced concrete walls at the first and basement levels to distribute column tensile loads into new reinforced concrete footings adjacent and connected to existing column footings.

4.2.2 East Tower Conceptual Construction Cost Estimate

Swinerton developed a conceptual cost estimate for the proposed retrofit elements described in Section 4.2.1. The estimated direct cost for the East Tower seismic retrofit is $20,690,965 and the estimated cost, including normal extra contractor general conditions, general requirements, insurance and fees, 10% contingency and 20% escalation is $34,008,944. All cost estimates are provided for reference in Appendix A.

4.3 North Wing (Building 4)

4.3.1 Description of Identified Deficiencies and the Proposed Retrofit

The following deficiencies were identified in the structural analysis/evaluation for SPC 4D. Following the description of each deficiency is a brief description of the proposed retrofit:

1. Metal deck diaphragm at the upper and lower roofs.

    - Deficiency: The diaphragm has insufficient strength to transfer seismic forces from the diaphragm to the vertical elements of the seismic force resisting system. Roof braces are added to increase the strength of the diaphragm.
    - Retrofit: Add steel bracing in the perimeter framing bays at the upper roof and lower roof.

2. Shear transfer mechanism to transfer forces from the lower to upper roofs.

    - Deficiency: The connection between the lower and upper roof diaphragms has insufficient strength to transfer seismic forces between levels.
    - Retrofit: Add supplemental steel connections and brace elements at the change in elevation between upper and lower roofs.

3. Chord and collector connections.

    - Deficiency: The chords and collectors at the first floor are insufficient to resist diaphragm seismic forces and transfer loads into the basement walls.
    - Retrofit: Install steel members as chords and collectors at the upper roof and Fiber Reinforced Polymer (FRP) strengthening at the first-floor level.

4. Connections between the concrete bond beams and reinforced masonry walls.

    - The existing detail between the concrete bond beams and reinforced masonry walls are not adequate to resist the seismic forces transferred between the two elements.
    - Retrofit: Add reinforced concrete element between the concrete bond beams and reinforced masonry walls.

5. Connections between the reinforced masonry walls and reinforced concrete basement walls.

    - The existing detail between the reinforced masonry walls and reinforced concrete basement walls are not adequate to resist the seismic forces transferred between the two elements.
    - Retrofit: Add reinforced concrete element between the concrete bond beams and reinforced masonry walls.

4.3.2 North Wing Conceptual Construction Cost Estimate

Swinerton developed a conceptual cost estimate for the proposed retrofit elements described in Section 4.3.1. The estimated direct cost for the North Wing seismic retrofit is $4,189,253 and

the estimated cost, including normal extra contractor general conditions, general requirements, insurance and fees, 10% contingency and 20% escalation is $6,885,714. All cost estimates are provided for reference in Appendix A.

4.4 Material Testing for SPC 4D Projects

The California Building Code (CBC) and OSHPD will require a certain level of material testing for any structural retrofit project. Our Phase 1 SPC 4D evaluations are based on rudimentary material properties anticipated for structures constructed around the dates indicated on the referenced construction drawings. The following materials are representative of the materials that will eventually need to be tested to determine appropriate design values for use when designing the final SPC 4D retrofits:

- Concrete
- Steel Reinforcing
- Structural Steel
- Metal Deck
- Masonry
- Mortar
- Grout
- Plywood
- Lumber

Without a specific material testing plan, Swinerton estimated a cost allowance for construction costs associated with anticipated material testing. The cost is based on recent experience with similar projects completed in other locations in California. The estimated direct cost for material testing required for all three buildings is $1,108,886 and the estimated cost, including normal extra contractor general conditions, general requirements, insurance and fees, 10% contingency and 20% escalation is $1,822,633. All cost estimates are provided for reference in Appendix A.

4.5 Cost Estimates for SPC 4D

SPC 4D retrofit costs are described for each of three buildings in the sections above. These costs are specific to the retrofit scope described for each building. Swinerton developed cost estimates for the retrofit scope. A summary of costs for SPC 4D retrofit is shown in Table 2.

Table 2: Cost Estimates for SPC 4D

Building	Direct Construction Cost	DCC + Costs & Fees	DCC + Cost & Fees + 10% Contingency + 20% Escalation
Main Hospital	$30,564,082	$38,058,338	$50,237,006
East Tower	$20,690,965	$25,764,351	$34,008,944
North Wing	$4,189,253	$5,216,450	$6,885,714
Subtotal	*$55,444,300*	*$69,039,139*	*$91,131,664*
Materials Testing	$1,108,886	$1,380,783	$1,822,633
Total	***$56,553,186***	***$70,419,922***	***$92,954,297***

The costs estimate presents three values for both building specific work and an allowance for material testing (assumed to be 2% of the project construction cost). The three estimates are:

1. Direct construction cost.
2. Direct construction cost plus general conditions, general requirements, insurance, fee.
3. Direct construction cost plus general conditions, general requirements, insurance, fee and 10% contingency and 20% escalation (based on starting construction after 2024).

The cost estimate excludes costs related to:

- Permit fees
- Plan check fees
- Design fees
- Builder's risk
- Utility costs
- Payment or performance bond premiums
- Costs for testing and inspection
- Hazardous material identification, testing and abatement
- Security guard services
- Owner's consultants and design fees
- Owner equipment
- Correction of existing code deficiencies beyond those associated with the AHSSA

4.6 Construction Schedule for SPC 4D Retrofit

SPC 4D retrofit costs are described for each of three buildings in the sections above. These costs consider construction occurring while the DRMC is fully operational. This assumption includes installing proper infection control measures, preparing and mobilizing contractors away from hospital entrances and construction activity is used to minimize disruption to existing operations and hospital staff. The estimated construction duration for this scenario is approximately 26 months. If the identified buildings were vacant before, during and after construction, the duration could be reduced to approximately 20 months, resulting in potential construction cost savings. Because construction schedule is highly dependent on operational parameters, further study is necessary to establish a proper link between construction cost and schedule. Construction schedule is typically refined during the development of construction documents.

5. NONSTRUCTURAL EVALUATION (NPC 4)

The AHSSA requires buildings rated NPC 2 be evaluated and modified (if required) to comply with NPC 4 before 1 January 2030. The first requirement is submission of a full nonstructural engineering evaluation for NPC 2 buildings to OSHPD for review and approval by 1 January 2024. The nonstructural evaluation must also consider elements required to achieve NPC 5. By 1 January 2026, the DRMC must submit a complete set of construction documents to bring all NPC 2 buildings into compliance with NPC 5. A building permit for all nonstructural retrofit projects must be received by 1 January 2028, with the construction work completed by 1 January 2030.

All twenty buildings will require a detailed nonstructural evaluation. The level of effort required for the evaluation report developed for each building varies as described in Section 1.4. All NPC retrofit projects will mitigate deficiencies identified in the associated nonstructural evaluation report. At this point in time, we assume that necessary infrastructure to achieve NPC 5 will be required as a separate construction project and will be assigned a placeholder cost for Phase 1.

The following sections describe an assumed scope of work and level of effort required by a licensed structural engineer to develop a full nonstructural evaluation report for each building based on its age, specific building information and regulatory requirements. Based on this assumed scope of work, SGH and Swinerton developed a cost model that describes an estimated cost for the construction associated with nonstructural compliance for NPC 4. NPC 4

is a conservative estimate of compliance and represents a realistic goal if no complete nonstructural evaluation report exists for each building. The nonstructural evaluation report may also explore the applicability of NPC 4D; a level of nonstructural seismic performance category that intends to reduce to the extent of nonstructural retrofit, effective 1 July 2019.

5.1 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Main Hospital & Additions (Building 1)

The Main Hospital & Additions building is the oldest building at DRMC. Because the building was originally constructed in the 1950s, with constant additions, modifications and remodel projects occurring throughout the building's history, this building represents the greatest challenge for attaining nonstructural seismic compliance. The building is identified as a type that is "designed before 1973" as described in Section 1.4. The building comprises approximately 96,000 sq ft of occupiable space. Much of the space has been renovated over the last 60 years.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Identify specific wall types (for those being retrofit).
- Create construction details for ceiling and wall retrofit.
- Create anchorage details for equipment and components.
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $770,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.2 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings East Tower (Building 2)

The East Tower was built around 1966. Because the building was originally constructed in the 1960s, the building is identified as a type that is "designed before 1973" as described in Section 1.4. The building comprises approximately 40,000 sq ft of occupiable space. Much of the space has been renovated over the last 50 years.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Identify specific wall types (for those being retrofit).
- Create construction details for ceiling and wall retrofit.
- Create anchorage details for equipment and components.
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.

- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the “Designer of Record” for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $180,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.3 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Woman & Infants Hospital (Building 3)

The Woman & Infants Hospital was built around 1990. Because the building was originally constructed after 1983, the building only requires evaluation and retrofit of the fire sprinkler system. The building comprises approximately 88,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Review fire sprinkler system shop drawings if available.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying fire sprinkler systems in the building.
- Create construction details for bracing fire sprinkler systems.
- Produce calculation package for submission to OSHPD.

- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $160,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.4 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings North Wing (Building 4)

The North Wing was built around 1971. Because the building was originally constructed before 1973, the building is identified as a type that is "designed before 1973" as described in Section 1.4. The building comprises approximately 19,000 sq ft of occupiable space. Much of the space has been renovated over the last 45 years.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).

- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Identify specific wall types (for those being retrofit).
- Create construction details for ceiling and wall retrofit.
- Create anchorage details for equipment and components.
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $86,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.5 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Central Plant (Building 5)

The Central Plant was built around 1974. Because the building was originally designed after 1973, the building is identified as a type that is "designed between 1973 and 1983" as described in Section 1.4. The building comprises approximately 15,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building (if required).
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit.
- Create anchorage details for equipment and components.
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the “Designer of Record” for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $100,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.6 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Shipping/Receiving (Building 6)

The Central Plant was built around 1977. Because the building was originally designed after 1973, the building is identified as a type that is “designed between 1973 and 1983” as described in Section 1.4. The building comprises approximately 16,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $50,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.7 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Surgery Wing (Building 7)

The Surgery Wing was built around 1977. Because the building was originally designed after 1973, the building is identified as a type that is "designed between 1973 and 1983" as described in Section 1.4. The building comprises approximately 105,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.

- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the “Designer of Record” for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our

estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $750,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.8 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings West Tower and West Tower Corridors (Building 8 and 8A through 8E)

The West Tower was built around 1977. Because the building was originally designed after 1973, the building is identified as a type that is “designed between 1973 and 1983” as described in Section 1.4. The buildings comprise approximately 110,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $850,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.9 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Lobby (Building 9)

The Lobby was built around 1990. Because the building was originally constructed after 1983, the building only requires evaluation and retrofit of the fire sprinkler system. The building comprises approximately 6,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Review fire sprinkler system shop drawings if available.

- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying fire sprinkler systems in the building.
- Create construction details for bracing fire sprinkler systems.
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $20,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.10 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Admitting (Building 10)

The Admitting building was built around 1977. Because the building was originally designed after 1973, the building is identified as a type that is "designed between 1973 and 1983" as described in Section 1.4. The building comprises approximately 9,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.

- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $40,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.11 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Elevator Tower and Elevator Tower Corridors (Buildings 11, 11.1, 11.2)

The Elevator Tower and Tower Corridors were built around 1977. Because the building was originally designed after 1973, the building is identified as a type that is "designed between 1973 and 1983" as described in Section 1.4. The buildings comprise approximately 16,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).

- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $90,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.12 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Dinah Shore Waiting Area (Building 12)

There are no available construction drawings for the Dinah Shore Waiting Area. We understand that the building was built around 1977. Because the building was likely designed after 1973, the building is identified as a type that is "designed between 1973 and 1983" as described in Section 1.4. The building comprises approximately 2,000 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).
- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.

- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $35,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.13 Scope of Work and Fee for Nonstructural Report and NPC 4 Retrofit Drawings Medical Records Building (Building 13)

The Medical Records Building was built around 1977. Because the building was originally designed after 1973, the building is identified as a type that is "designed between 1973 and 1983" as described in Section 1.4. The building comprises approximately 500 sq ft of occupiable space.

This building will require the following scope of work to complete a nonstructural evaluation report:

- Review all original architectural drawings associated with this building.
- Confirm original approved construction drawings show pertinent nonstructural details.
- Review all remodel project drawings associated with this building.
- Develop and manage site investigations with hospital management and staff.
- Access areas to observe existing conditions above the ceiling.
- Access areas to observe wall construction.
- Walk through the existing building to confirm all equipment and components are identified.
- Perform calculations to confirm adequacy of existing equipment anchorage (optional).
- Perform calculations to confirm adequacy of existing component construction (optional).
- Develop test protocols to confirm existing element anchorage (optional).

- Compile observation data into drawing form for use in report.
- Produce nonstructural evaluation report for submission to OSHPD.
- Iterate with OSHPD during the review phase.

The following scope of work is required to complete nonstructural retrofit construction documents:

- Create plans identifying equipment, components and architectural elements in the building.
- Create plans identifying distributed systems in the building.
- Identify specific ceiling types on reflected ceiling plans (for those being retrofit).
- Create construction details for ceiling and wall retrofit (if required).
- Create anchorage details for equipment and components (if required).
- Develop test plan and test protocols for testing existing construction (optional).
- Produce calculation package for submission to OSHPD.
- Produce construction drawings for submission to OSHPD.
- Produce construction specifications for submission to OSHPD.

A structural engineer can act as the "Designer of Record" for any OSHPD project. Traditionally, structural engineers developed nonstructural evaluation reports and construction documents for nonstructural retrofit projects. Our estimate of scope and fee assumes that SGH will perform the work described above or contract with consultants to provide services as necessary. Our estimate of fee for this work is based on previous experience and estimated construction cost associated with the anticipated nonstructural retrofit for this building.

We estimate a fee of approximately $10,000 is required to complete a nonstructural evaluation report and set of NPC 4 retrofit construction documents for this building.

5.14 NPC 4 Retrofit Construction Cost Model

The existing buildings comprise approximately 550,000 sq ft. of occupiable space. Using an estimate of space for each building and department, we apply an estimate of cost for construction associated with typical retrofit work needed to bring the building into compliance with NPC 4. Because the DRMC does not have any recent nonstructural evaluation reports that include evaluation of required infrastructure to attain NPC 5 considering operational

characteristics, we estimate a placeholder range of $1M to $2M for constructing NPC 5 infrastructure, which typically comprises valving, and tanks for wastewater, water and fuel.

Sections 5.1 through 5.13 describe the scope of work necessary to complete a nonstructural evaluation report that will define the actual scope of work necessary to bring each building at the DRMC into compliance with NPC 4. In consideration of the many areas that have been remodeled, the unit costs are individually developed considering potential savings associated with compliant work in remodeled areas. In addition to recognizing savings associated with previously completed work, costs are developed considering efficiencies related to simultaneous construction, primarily for Building 1, Building 2 and Building 4; each of these buildings require both nonstructural and structural retrofit.

Without a detailed nonstructural evaluation report, our cost model presents uncertainty. To account for this uncertainty, Swinerton developed a cost model that considers a 10% contingency. The cost model also presents costs associated with the contractor's mark-up and escalation (calculated at 20%, assuming construction starts after 2024). Direct costs are identified as "Low" and costs including mark-up, contingency and escalation are identified as "High" in Table 3 below.

Table 3: NPC 4 Retrofit Construction Cost Model

Building Name	Estimate of Affected Area	Consulting Fee Estimate	NPC 4 Cost Estimate (Low)	NPC 4 $/SF Estimate (Low)	NPC 4 Cost Estimate (High)	NPC 4 $/SF Estimate (High)
Main Hospital & Additions	95,913	$770,000	$7,013,131	$74	$9,257,332	$98
East Tower	40,418	$180,000	$1,599,608	$40	$2,111,483	$52
Woman & Infants Hospital	88,486	$160,000	$2,284,060	$26	$3,014,959	$34
North Wing	18,790	$86,000	$777,342	$41	$1,026,092	$55
Central Plant	15,159	$100,000	$1,102,969	$73	$1,455,919	$96
Shipping/Receiving	15,742	$50,000	$642,274	$41	$847,801	$54
Surgery Wing	105,266	$750,000	$6,657,195	$63	$8,787,497	$83
West Tower (Sinatra Tower)	110,614	$850,000	$11,480,166	$104	$15,153,819	$137
Lobby	6,214	$20,000	$154,020	$25	$203,307	$33
Admitting	9,141	$40,000	$360,952	$39	$476,457	$52
Elevator Tower	16,254	$90,000	$805,270	$50	$1,062,956	$65
Dinah Shore Waiting Area	2,006	$35,000	$202,770	$101	$267,657	$133
Medical Records Building	507	$10,000	$24,961	$49	$32,948	$65
Public Spaces	22,881	$15,000	$1,518,001	$66	$2,003,761	$88
Total Medical Center	***547,391***	***$3,156,000***	***$34,622,719***	***$63***	***$45,701,988***	***$84***

At this stage of our evaluation, we recommend considering costs in the range of $38 to $49 million for bringing all buildings at the DRMC into compliance with NPC 4, including professional fees and construction of NPC 5 infrastructure.

5.15 Schedule for NPC 4 Evaluation Reports and Retrofit Construction

Nonstructural Evaluation Reports are based on actual existing conditions that must be collected by the consultant team. Once collected, the data must be synthesized and documented in a format easily accepted and reviewed by OSHPD. Data collection can take many months to complete and may depend on access and operational constraints (e.g. operating suites are available only on weekends). Report generation requires extensive documentation of both existing conditions and existing drawings that may show compliant conditions. Based on similar projects, nonstructural evaluation reports can likely be completed in 20 to 24 months.

NPC 4 retrofit costs are identified in the cost model identified as Table 3 above. The cost model uses a base assumption that construction work is performed on “straight time” in the fully operational medical center. This assumes that proper infection control measures are in place and that remote construction preparation and mobilization is required to minimize disruption to existing operations and hospital staff. The estimated construction duration for this scenario is approximately 16 months. Variations related to working hours (off-hours or weekends) can drastically affect the construction duration and construction cost. Because schedule is highly dependent on operational parameters, further study, including meetings with operational staff, is necessary to establish a proper link between cost and schedule. Construction schedule is typically refined during the construction document development phases of a project.

6. CONCLUSIONS

The DRMC requires seismic retrofit of three buildings and nonstructural retrofit for twenty buildings. Table 4 shows an approximate range of costs for structural retrofit, nonstructural retrofit and total medical center retrofit project costs. These costs represent a reasonable estimate of construction and consulting fees as estimated by Swinerton and SGH, given experience with similar projects of scope and size, completed in the last several years. We recommend that DHD consider the high end of the range, when estimating necessary budgets for completing construction work associated with the AHSSA. Currently, we estimate an appropriate budget range to bring the DRMC into compliance with the AHSSA is between $119 and $180M, which includes estimates of soft costs associated with professional fees, inspection, etc.

Table 4: Structural Retrofit, Nonstructural Retrofit and Total Medical Center Costs

Building Name	Estimate of Affected Area	SPC4D + NPC 4 Cost Estimate (Low)	SPC4D + NPC 4 $/SF (Low)	SPC4D + NPC 4 + 10% Contingency + 20 % Escalation Cost Estimate (High)	SPC4D + NPC 4 + 10% Contingency + 20 % Escalation $/SF (High)
Main Hospital & Additions	95,913	$38,345,273	$400	$60,261,778	$628
East Tower	40,418	$22,470,573	$556	$36,300,427	$898
Woman & Infants Hospital	88,486	$2,444,060	$26	$3,174,959	$34
North Wing	18,790	$5,052,595	$269	$7,997,806	$426
Central Plant	15,159	$1,202,969	$73	$1,555,919	$96
Shipping/Receiving	15,742	$692,274	$41	$897,801	$54
Surgery Wing	105,266	$7,407,195	$63	$9,537,497	$83
West Tower (Sinatra Tower)	110,614	$12,330,166	$104	$16,003,819	$137
Lobby	6,214	$174,020	$25	$223,307	$33
Admitting	9,141	$400,952	$39	$516,457	$52
Elevator Tower	16,254	$895,270	$50	$1,152,956	$65
Dinah Shore Waiting Area	2,006	$237,770	$101	$302,657	$133
Medical Records Building	507	$35,000	$50	$43,000	$66
Public Spaces	22881	$1,533,001	$66	$2,018,761	$88
Material Testing		$1,108,886		$1,822,633	
NPC 5		$1,000,000		$2,000,000	
Subtotal		***$95,330,004***		***$143,809,777***	
Soft Costs[1] (25% Subtotal)		*$23,832,501*		*$35,952,444*	
Total Including Soft Costs	***547,391***	***$119,162,505***	***$217.69***	***$179,762,221***	***$328.40***

Footnote 1: Soft costs include those costs excluded by Swinerton and other project costs typical for this type of work: The cost estimate excludes costs related to:

- *permit fees*
- *plan check fees*
- *design fees*
- *builder's risk*
- *utility costs*
- *payment or performance bond premiums*
- *costs for testing and inspection*
- *hazardous material identification, testing and abatement*
- *security guard services*
- *owner's consultants and design fees*
- *owner equipment*
- *correction of existing code deficiencies beyond those associated with the AHSSA*

APPENDIX A

Desert Regional Medical Center

Palm Springs California

Conceptual SPC 4 ROM Estimate

December 21, 2018

SUMMARY			
SPC 4D Areas of Work	Direct Cost	Cost w/ Contractor GCs, GRs, Insurance & Fee	Cost w/ 10% Contingency & 20% Escalation
Main Hospital Retrofit Scheme	$ 30,564,082	$ 38,058,338	$ 50,237,006
Building 2 - East Tower Retrofit Scheme	$ 20,690,965	$ 25,764,351	$ 34,008,944
Building 4 - North Wing Retrofit Scheme	$ 4,189,253	$ 5,216,450	$ 6,885,714
SPC Totals	$ 55,444,300	$ 69,039,140	$ 91,131,664
Comprehensive Data Collection MTCAP: OSHPD Materials Testing and Conditions Assessment for Projects			
MTCAP Allowance	$ 1,108,886	$ 1,380,783	$ 1,822,633
Project Totals	**$ 56,553,186**	**$ 70,419,922**	**$ 92,954,297**

Qualifications

Exclusions

1. Permit fees, plan check fees, design fees, Builders Risk.
2. All utility costs.
3. Payment or performance bond premiums.
4. Testing and Inspection costs.
5. Hazardous material identification, abatement or testing.
6. Security guard service.
7. Owner's consultants.
8. Utility costs.
9. Soil, structural, mechanical, engineering.
10. Owner equipment.
11. Correction of existing code deficiencies.

Desert Regional Medical Center
Palm Springs California
Conceptual SPC 4 ROM Estimate - Detailed By Level Summary
December 21, 2018

DETAIL BY LEVEL SUMMARY

SPC 4D Areas of Work	Direct Cost	Cost w/ Contractor GCs, GRs, Insurance & Fee	Cost w/ 10% Contingency & 20% Escalation
Main Hospital Retrofit Scheme	$ 30,564,082	$ 38,058,338	$ 50,237,006
Wing A Strengthening Plan	$ 2,687,830	$ 3,346,881	$ 4,417,883
Wing B Strengthening Plan	$ 615,566	$ 766,502	$ 1,011,782
Wing C Strengthening Plan	$ 4,189,534	$ 5,216,800	$ 6,886,176
Wing D & E Strengthening Plan	$ 6,030,562	$ 7,509,244	$ 9,912,203
Wing F Strengthening Plan	$ 2,039,062	$ 2,539,037	$ 3,351,528
Wing G Strengthening Plan	$ 692,512	$ 862,314	$ 1,138,255
Wing H Strengthening Plan	$ 14,309,016	$ 17,817,560	$ 23,519,179
	Direct Cost	Cost w/ Contractor Costs	Cost w/ Escalation & Contin.
Building 2 - East Tower Retrofit Scheme	$ 20,690,965	$ 25,764,351	$ 34,008,944
Basement	$ 3,767,181	$ 4,690,887	$ 6,191,970
1st Floor	$ 6,079,013	$ 7,569,576	$ 9,991,841
2nd Floor	$ 6,711,761	$ 8,357,472	$ 11,031,863
3rd Floor	$ 1,257,740	$ 1,566,135	$ 2,067,299
4th Floor	$ 1,326,704	$ 1,652,009	$ 2,180,652
Roof	$ 1,548,567	$ 1,928,272	$ 2,545,319
	Direct Cost	Cost w/ Contractor Costs	Cost w/ Escalation & Contin.
Building 4 - North Wing Retrofit Scheme	$ 4,189,253	$ 5,216,450	$ 6,885,714
Exterior Wall	$ 2,449,050	$ 3,049,553	$ 4,025,409
Main Level	$ 63,165	$ 78,653	$ 103,821
Roof	$ 1,677,038	$ 2,088,245	$ 2,756,484
Project SPC 4D Totals	$ 55,444,300	$ 69,039,140	$ 91,131,664
MTCAP - Assume 2% of Overall Cost	$ 1,108,886	$ 1,380,783	$ 1,822,633

Exclusions
1. Permit fees, plan check fees, design fees, Builders Risk.
2. All utility costs.
3. Payment or performance bond premiums.
4. Testing and Inspection costs.
5. Hazardous material identification, abatement or testing.
6. Security guard service.
7. Owner's consultants.
8. Utility costs.
9. Soil, structural, mechanical, engineering.
10. Owner equipment.
11. Correction of existing code deficiencies.

SWINERTON

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Desert Regional Medical Center
Palm Springs California
Conceptual NPC 4 ROM Estimate
January 11, 2019

DEPT	AREA (SQ. FT.)	Unit	Unit Cost w/ Contractor Costs: Equipment Bracing	Utility Bracing	Fire Sprinkler Bracing	Ceiling Bracing	Wall Bracing	$/w/ Contractor Mark-up	$/SF	$/w/Contingency	$/SF	$/w/Escalation	$/SF
Building 1 - Main Hospital & Additions	**95,913 SF**	**74 $/SF**						**$ 7,013,131**	**74 $/SF**	**$ 7,714,444**	**82 $/SF**	**$ 9,257,332**	**98 $/SF**
OUTPATIENT MATERNAL FETAL	5,173	$ 43.18	$ 5.78	$ 6.80	$ 27.20	$ 3.40	$ -	$ 223,370	$ 43	$ 245,707	$ 47	$ 294,849	$ 57
CARDIO PULMO	3,772	$ 105.01	$ 13.14	$ 36.18	$ 28.56	$ 27.13	$ -	$ 396,081	$ 105	$ 435,689	$ 116	$ 522,827	$ 139
DR. LOUNGE	1,133	$ 42.16	$ 5.44	$ 10.88	$ 18.36	$ 7.48	$ -	$ 47,767	$ 42	$ 52,544	$ 46	$ 63,053	$ 56
ACUTE REHAB	7,038	$ 53.24	$ 5.64	$ 12.92	$ 27.20	$ 7.48	$ -	$ 374,731	$ 53	$ 412,204	$ 59	$ 494,645	$ 70
BUSINESS SERVICES	4,380	$ 77.68	$ 7.62	$ 23.80	$ 25.70	$ 20.56	$ -	$ 340,252	$ 78	$ 374,278	$ 85	$ 449,133	$ 103
PHY THERAPY	4,936	$ 105.96	$ 7.90	$ 34.27	$ 38.08	$ 25.70	$ -	$ 523,007	$ 106	$ 575,307	$ 117	$ 690,369	$ 140
THERAPY	4,631	$ 105.96	$ 7.90	$ 34.27	$ 38.08	$ 25.70	$ -	$ 490,690	$ 106	$ 539,759	$ 117	$ 647,710	$ 140
POST PARTUM - BLDG 1	8,673	$ 86.69	$ 7.81	$ 33.32	$ 38.08	$ 7.48	$ -	$ 751,831	$ 87	$ 827,014	$ 95	$ 992,417	$ 114
MED SURGE - BLDG 1	4,705	$ 105.96	$ 7.90	$ 34.27	$ 38.08	$ 25.70	$ -	$ 498,531	$ 106	$ 548,384	$ 117	$ 658,060	$ 140
PEDIATRICS	4,180	$ 105.96	$ 7.90	$ 34.27	$ 38.08	$ 25.70	$ -	$ 442,903	$ 106	$ 487,193	$ 117	$ 584,632	$ 140
GI - ENDO	1,669	$ 76.16	$ 6.12	$ 24.48	$ 27.20	$ 18.36	$ -	$ 127,111	$ 76	$ 139,822	$ 84	$ 167,787	$ 101
BUSINESS SERVICES - MED RECORDS	7,430	$ 65.96	$ 6.53	$ 20.40	$ 22.03	$ 17.00	$ -	$ 490,083	$ 66	$ 539,091	$ 73	$ 646,909	$ 87
FACILITIES - ENG	3,565	$ 61.58	$ 6.53	$ 18.70	$ 20.20	$ 16.16	$ -	$ 219,536	$ 62	$ 241,489	$ 68	$ 289,787	$ 81
ADMINISTRATION	11,665	$ 53.04	$ 2.99	$ 17.00	$ 18.36	$ 14.69	$ -	$ 618,712	$ 53	$ 680,583	$ 58	$ 816,699	$ 70
NON-PATIENT CARE	9,400	$ 54.81	$ 4.76	$ 17.00	$ 18.36	$ 14.69	$ -	$ 515,195	$ 55	$ 566,715	$ 60	$ 680,058	$ 72
MECH/ELEC	3,422	$ 40.80	$ 24.48	$ 16.32	$ -	$ -	$ -	$ 139,618	$ 41	$ 153,579	$ 45	$ 184,295	$ 54
PUBLIC CORRIDOR	10,141	$ 80.24	$ -	$ 25.16	$ 27.20	$ 7.48	$ 20.40	$ 813,714	$ 80	$ 895,085	$ 88	$ 1,074,102	$ 106
Building 2 - East Tower	**40,418 SF**	**40 $/SF**						**$ 1,599,608**	**40 $/SF**	**$ 1,759,569**	**44 $/SF**	**$ 2,111,483**	**52 $/SF**
LAB	5,975	$ 50.02	$ 13.30	$ 29.92	$ -	$ 6.80	$ -	$ 298,871	$ 50	$ 328,758	$ 55	$ 394,509	$ 66
ORTHO	9,733	$ 33.32	$ 5.44	$ 17.00	$ -	$ 3.40	$ 7.48	$ 324,304	$ 33	$ 356,734	$ 37	$ 428,081	$ 44
MED SURGE - BLDG 2 - FLR 3	10,170	$ 33.52	$ 5.64	$ 24.48	$ -	$ 3.40	$ -	$ 340,939	$ 34	$ 375,033	$ 37	$ 450,040	$ 44
SNF - BLDG 2	10,170	$ 55.96	$ 5.64	$ 24.48	$ -	$ 18.36	$ 7.48	$ 569,154	$ 56	$ 626,069	$ 62	$ 751,283	$ 74
STAIRCASES	3,360	$ 7.48	$ -	$ 7.48	$ -	$ -	$ -	$ 25,133	$ 7	$ 27,646	$ 8	$ 33,175	$ 10
MECH PENTHOUSE	1,010	$ 40.80	$ 20.40	$ 20.40	$ -	$ -	$ -	$ 41,208	$ 41	$ 45,329	$ 45	$ 54,395	$ 54
Building 3 - Woman & Infants Hospital	**88,486 SF**	**26 $/SF**						**$ 2,284,060**	**26 $/SF**	**$ 2,512,466**	**28 $/SF**	**$ 3,014,959**	**34 $/SF**
LDRP	18,051	$ 32.64	$ -	$ -	$ 32.64	$ -	$ -	$ 589,185	$ 33	$ 648,103	$ 36	$ 777,724	$ 43
NICU	8,148	$ 32.64	$ -	$ -	$ 32.64	$ -	$ -	$ 265,951	$ 33	$ 292,546	$ 36	$ 351,055	$ 43
POST PARTUM - BLDG 3	3,421	$ 32.64	$ -	$ -	$ 32.64	$ -	$ -	$ 111,661	$ 33	$ 122,828	$ 36	$ 147,393	$ 43
EMERGENCY DEPT.	12,801	$ 29.79	$ -	$ -	$ 29.79	$ -	$ -	$ 381,352	$ 30	$ 419,487	$ 33	$ 503,385	$ 39
RADIOLOGY	25,328	$ 20.40	$ -	$ -	$ 20.40	$ -	$ -	$ 516,691	$ 20	$ 568,360	$ 22	$ 682,032	$ 27
PUBLIC SPACE	1,120	$ 28.56	$ -	$ -	$ 28.56	$ -	$ -	$ 31,987	$ 29	$ 35,186	$ 31	$ 42,223	$ 38
HELIPAD	10,126	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
MECH PENTHOUSE - BLDG 3	9,491	$ 40.80	$ 20.40	$ 20.40	$ -	$ -	$ -	$ 387,233	$ 41	$ 425,956	$ 45	$ 511,147	$ 54
Building 4 - North Wing	**18,790 SF**	**41 $/SF**						**$ 777,342**	**41 $/SF**	**$ 855,077**	**46 $/SF**	**$ 1,026,092**	**55 $/SF**
ADMINISTRATION OFFICES (Basement)	9,395	$ 40.80	$ 5.44	$ 12.92	$ 20.40	$ 2.04	$ -	$ 383,316	$ 41	$ 421,648	$ 45	$ 505,977	$ 54
NON-PATIENT CARE (First Floor)	9,395	$ 41.94	$ 5.44	$ 12.92	$ 19.04	$ 2.04	$ 2.50	$ 394,026	$ 42	$ 433,429	$ 46	$ 520,115	$ 55
Building 5 - Central Plant	**15,159 SF**	**73 $/SF**						**$ 1,102,969**	**73 $/SF**	**$ 1,213,266**	**80 $/SF**	**$ 1,455,919**	**96 $/SF**
CENTRAL PLANT	15,159	$ 72.76	$ 20.40	$ 27.20	$ 24.48	$ 0.68	$ -	$ 1,102,969	$ 73	$ 1,213,266	$ 80	$ 1,455,919	$ 96
Building 6 - Shipping/Receiving	**15,742 SF**	**41 $/SF**						**$ 642,274**	**41 $/SF**	**$ 706,501**	**45 $/SF**	**$ 847,801**	**54 $/SF**
EXTERIOR LOADING DOCK	15,742	$ 40.80	$ 5.44	$ 17.00	$ 18.36	$ -	$ -	$ 642,274		$ 706,501		$ 847,801	

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Desert Regional Medical Center
Palm Springs California
Conceptual NPC 4 ROM Estimate
January 11, 2019

			Unit Cost w/ Contractor Costs										
DEPT	AREA (SQ. FT.)	Unit	Equipment Bracing	Utility Bracing	Fire Sprinkler Bracing	Ceiling Bracing	Wall Bracing	$/w/ Contractor Mark-up	$/SF	$/w/Contingency	$/SF	$/w/Escalation	$/SF
Building 7 - Surgery Wing	**105,266 SF**	**63 $/SF**						**$ 6,657,195**	**63 $/SF**	**$ 7,322,914**	**70 $/SF**	**$ 8,787,497**	**83 $/SF**
KITCHEN	9,606	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 533,018	$ 55	$ 586,320	$ 61	$ 703,583	$ 73
SPD	4,569	$ 62.97	$ 8.84	$ 20.40	$ 19.04	$ 14.69	$ -	$ 287,701	$ 63	$ 316,471	$ 69	$ 379,765	$ 83
CENTRAL SUPPLY	3,044	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 168,905	$ 55	$ 185,796	$ 61	$ 222,955	$ 73
SHIPPING/REC	2,314	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 128,399	$ 55	$ 141,239	$ 61	$ 169,487	$ 73
PHARMACY	4,331	$ 80.44	$ 24.34	$ 20.40	$ 20.40	$ 15.30	$ -	$ 348,387	$ 80	$ 383,225	$ 88	$ 459,870	$ 106
I/T	2,994	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 166,131	$ 55	$ 182,744	$ 61	$ 219,293	$ 73
ADMIN SERVICES	2,971	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 164,855	$ 55	$ 181,340	$ 61	$ 217,608	$ 73
ADMINISTRATIVE OFFICES	9,331	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 517,759	$ 55	$ 569,534	$ 61	$ 683,441	$ 73
CAFETERIA	6,810	$ 55.49	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ -	$ 377,873	$ 55	$ 415,661	$ 61	$ 498,793	$ 73
OUTPATIENT SERVICES	1,067	$ 80.44	$ 24.34	$ 20.40	$ 20.40	$ 15.30	$ -	$ 85,830	$ 80	$ 94,413	$ 88	$ 113,295	$ 106
SURGICAL/OR	23,624	$ 101.59	$ 11.56	$ 35.90	$ 27.20	$ 26.93	$ -	$ 2,399,920	$ 102	$ 2,639,912	$ 112	$ 3,167,894	$ 134
CATH LAB	6,344	$ 75.00	$ 9.38	$ 25.84	$ 20.40	$ 19.38	$ -	$ 475,825	$ 75	$ 523,408	$ 83	$ 628,089	$ 99
MECH PENTHOUSE	13,061	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
PUBLIC CORRIDOR	15,200	$ 65.96	$ -	$ 25.16	$ 27.20	$ 6.12	$ 7.48	$ 1,002,592	$ 66	$ 1,102,851	$ 73	$ 1,323,421	$ 87
Building 8 - West Tower (Sinatra Tower)	**110,614 SF**	**104 $/SF**						**$ 11,480,166**	**104 $/SF**	**$ 12,628,182**	**114 $/SF**	**$ 15,153,819**	**137 $/SF**
MECH/ELEC	7,780	$ 79.95	$ 22.72	$ 24.48	$ 16.32	$ 2.72	$ 13.71	$ 621,983	$ 80	$ 684,181	$ 88	$ 821,017	$ 106
ICU	18,934	$ 129.71	$ 16.63	$ 37.40	$ 32.30	$ 22.44	$ 20.94	$ 2,455,915	$ 130	$ 2,701,506	$ 143	$ 3,241,808	$ 171
MED SURGE - BLDG 8 - FLR 2	18,934	$ 107.15	$ 7.06	$ 30.60	$ 34.00	$ 18.36	$ 17.14	$ 2,028,797	$ 107	$ 2,231,677	$ 118	$ 2,678,012	$ 141
MED SURGE - BLDG 8 - FLR 3	18,934	$ 107.15	$ 7.06	$ 30.60	$ 34.00	$ 18.36	$ 17.14	$ 2,028,797	$ 107	$ 2,231,677	$ 118	$ 2,678,012	$ 141
MED SURGE - BLDG 8 - FLR 4	18,934	$ 107.15	$ 7.06	$ 30.60	$ 34.00	$ 18.36	$ 17.14	$ 2,028,797	$ 107	$ 2,231,677	$ 118	$ 2,678,012	$ 141
MED SURGE - BLDG 8 - FLR 5	18,934	$ 105.74	$ 5.64	$ 30.60	$ 34.00	$ 18.36	$ 17.14	$ 2,002,081	$ 106	$ 2,202,289	$ 116	$ 2,642,747	$ 140
PENTHOUSE	1,135	$ 23.80	$ 3.40	$ 20.40	$ -	$ -	$ -	$ 27,013	$ 24	$ 29,714	$ 26	$ 35,657	$ 31
MECH PENTHOUSE - BLDG 8	7,029	$ 40.80	$ 20.40	$ 20.40	$ -	$ -	$ -	$ 286,783	$ 41	$ 315,462	$ 45	$ 378,554	$ 54
Building 9 - Lobby	**6,214 SF**	**25 $/SF**						**$ 154,020**	**25 $/SF**	**$ 169,422**	**27 $/SF**	**$ 203,307**	**33 $/SF**
MAIN ENTRANCE/LOBBY	6,214	$ 24.79	$ -	$ -	$ 24.79	$ -	$ -	$ 154,020	$ 25	$ 169,422	$ 27	$ 203,307	$ 33
Building 10 - Admitting	**9,141 SF**	**39 $/SF**						**$ 360,952**	**39 $/SF**	**$ 397,047**	**43 $/SF**	**$ 476,457**	**52 $/SF**
LOBBY/REGISTRATION	6,306	$ 22.95	$ -	$ -	$ 22.95	$ -	$ -	$ 144,723	$ 23	$ 159,195	$ 25	$ 191,034	$ 30
MORGUE	965	$ 80.44	$ 24.34	$ 20.40	$ 20.40	$ 15.30	$ -	$ 77,625	$ 80	$ 85,387	$ 88	$ 102,465	$ 106
MORGUE - OFFICE SPACE	1,870	$ 74.12	$ 16.32	$ 20.40	$ 20.40	$ 17.00	$ -	$ 138,604	$ 74	$ 152,465	$ 82	$ 182,958	$ 98
Building 11 - Elevator Tower	**16,254 SF**	**50 $/SF**						**$ 805,270**	**50 $/SF**	**$ 885,797**	**54 $/SF**	**$ 1,062,956**	**65 $/SF**
ELEVATOR CORRIDOR SPACE	13,932	$ 51.00	$ -	$ 20.40	$ 28.56	$ 2.04	$ -	$ 710,532	$ 51	$ 781,585	$ 56	$ 937,902	$ 67
MECH PENTHOUSE	2,322	$ 40.80	$ 20.40	$ 20.40	$ -	$ -	$ -	$ 94,738	$ 41	$ 104,211	$ 45	$ 125,054	$ 54
Building 12 - Dinah Shore Waiting Area	**2,006 SF**	**101 $/SF**						**$ 202,770**	**101 $/SF**	**$ 223,048**	**111 $/SF**	**$ 267,657**	**133 $/SF**
WAITING ROOM	2,006	$ 101.08	$ 8.16	$ 25.50	$ 27.54	$ 22.03	$ 17.85	$ 202,770	$ 101	$ 223,048	$ 111	$ 267,657	$ 133
Building 13 - Medical Records	**507 SF**	**49 $/SF**						**$ 24,961**	**49 $/SF**	**$ 27,457**	**54 $/SF**	**$ 32,948**	**65 $/SF**
MEDICAL RECORDS ROOM	507	$ 49.23	$ 5.44	$ 5.44	$ 16.32	$ 22.03	$ -	$ 24,961	$ 49	$ 27,457	$ 54	$ 32,948	$ 65
Public Spaces	**22,881 SF**	**66 $/SF**						**$ 1,518,001**	**66 $/SF**	**$ 1,669,801**	**73 $/SF**	**$ 2,003,761**	**88 $/SF**
PUBLIC SPACE	3,863	$ 61.20	$ -	$ 25.16	$ 27.20	$ 8.84	$ -	$ 236,416	$ 61	$ 260,057	$ 67	$ 312,069	$ 81
FACILITIES - ENG	19,018	$ 67.39	$ 5.44	$ 17.00	$ 18.36	$ 14.69	$ 11.90	$ 1,281,585	$ 67	$ 1,409,743	$ 74	$ 1,691,692	$ 89
Total	**547,391**	**SF**						**34,622,717**	**$ 63**	**38,084,989**	**$ 70**	**45,701,987**	**$ 84**