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Project:	UCI MESA COURT EXPANSION	Job:	547

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Project:	UCI MESA COURT EXPANSION	Job:	547
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	DESIGN CRITERIA	By:	JBL

1.0 GENERAL DESIGN CRITERIA

GOVERNING BUILDING CODE

2013 California Building Code

REFERENCED STANDARDS

ASCE/SEI - 7-10 Minimum Design Loads for Buildings & Other Structures

ACI - 318-11 Building Code Requirements for Structural Concrete

AISC - Manual of Steel Construction, 14th Edition

AISC - 360-10 Specification for Structural Steel Buildings

PCI - Manual 120-10 PCI Design Handbook, 7th Edition

PCI - Manual 128-01 Recommended Practice for Glass Fiber Reinforced Concrete Panels, 4th Edition

RISK CATEGORY

Risk Category: III

DEFLECTION LIMITS

Out-of-plane deflection limits for Exterior Wall Elements shall be in accordance with CBC Table 1604.3 and CBC Section 2403.3 as follows:

	Interior Span	Cantilever	Max.
§1604.3 - Flexible Finishes (Precast, C-CAPP, GFRC)	L/120	a/60	3/4"
§2403.3 - Structural Support of Glazing	L/175	a/88	3/4"

2.0 DESIGN LOADS

2.1 DESIGN DEAD LOADS

2.1.1 GFRC PANELS

 0.375" Face Mix @ 145 pcf
 = 4.53 psf

 0.625" Backup Mix @ 135 pcf
 = 7.03 psf

 Steel Frame Weight
 = 5.00 psf

 GFRC Reveals & Overlays
 = 0.44 psf

 Total GFRC Panel System Weight
 = 17.00 psf

SEISMIC LOADS



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HENSEL PHELPS

UCI MESA COURT EXPANSION

Job: Sheet:

547 1.5

12/2014 Date: By: **JBL**

Precast. Building for Life.

2.3 DESIGN SEISMIC LOADS

Project:

Contractor:

2.3.1 SEISMIC DESIGN CRITERIA

Risk Category: III

Structure: $I_e = 1.25$ Components: $I_p = 1.0$ Importance Factors:

Site Parameters: Latitude: 33.651° N Longitude: 117.846° W Site Class: D $S_{DS} = 1.056$ $S_{D1} = 0.501$ $S_1 = 0.579$ Acceleration Parameters:

SDC = DSeismic Design Category:

2.3.2 SEISMIC FORCES

 $F_p = 0.4 \text{ ap S}_{DS} (I_p / R_p) (1+2z/h) W_p$ (ASCE 7 Eqn. 13.3-1) $F_p \le 1.6 S_{DS} I_p W_p$ (ASCE 7 Eqn. 13.3-2) $F_p \ge 0.3 S_{DS} I_p W_p$ (ASCE 7 Eqn. 13.3-3)

SEISMIC FORCE, F _p ,	SEISMIC FORCE, F_p , by Component			F _p (Eqn.	. 13.3-1)	Code Reference
DESIGN ELEMENT	a _p	R _p	F _p , min	z/h = 0	z/h = 1.000	Code Releience
Panel Flexure	1.00	2.50	2.50 0.32 W _p 0.17 W _p 0.51 W _p		0.51 W _p	ASCE 7: §13.3, §13.5.3
Parapet Flexure	2.50	2.50	0.32 W _p	N/A	1.27 W _p	ASCE 7: §13.3, §13.5.3
Connection Components	1.00	2.50	0.32 W _p	0.17 W _p	0.51 W _p	ASCE 7: §13.3, §13.5.3
Connection Fasteners	1.25	1.00	0.32 W _p	0.53 W _p	1.58 W _p	ASCE 7: §13.3, §13.5.3
Cladding Nonductile Anchorage to Concrete †	$Ω_0$ x Fawhere $Ω$		0.475 W _p	0.792 W _p	2.376 W _p	ACI 318 §D.3.3.4.3(d), ASCE 7 Table 13.5-1

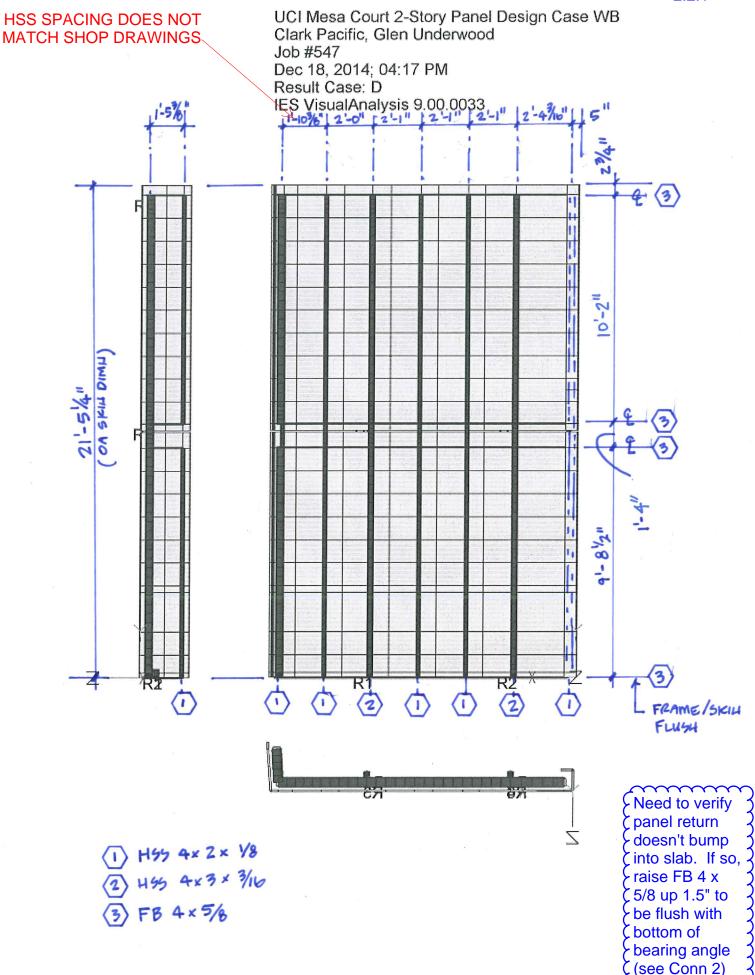
[†] Ω_o amplification required when the strength-level seismic component of the load exceeds 20% of the factored load combination

Per ACI 318 §D.3.3.4.3(d) and §D.3.3.5.3 (c), minimum non-ductile anchorage-to-concrete design forces shall be magnified by the applicable Ω_0 from ASCE Tbl 13.5-1 when the seismic component of the load exceeds 20% of the factored load combination.

2.3.3 STORY DRIFT COMPATIBILITY - ASCE 7 §13.3.2

Deformation compatibility of panel joints and connections shall be based on relative displacements equal to $(D_D * I_e)$, where D_D is calculated from the design story drifts (Δ) given below. Where Δ has not been given, the code-specified maximum allowable story drift Δ a shall be used to determine D_p .

Level	Story Ht. (ft)	Δ (%)	Δ (in.)	D _p *I _e (%)	D _p *I _e (in.)
6-P	10.75	1.27	1.64	1.59	2.05
5-6	10.75	1.26	1.63	1.58	2.04
4-5	10.75	1.26	1.63	1.58	2.04
3-4	10.75	1.19	1.54	1.49	1.93
2-3	10.75	1.16	1.50	1.45	1.88
1-2	19.00	0.88	2.00	1.10	2.50



GENERAL NOTES

GOVERNING BUILDING CODE

2013 CALIFORNIA BUILDING CODE

REFERENCED STANDARDS:

ASCE/SEI - ASCE 7-10 - MINIMUM DESIGN LOADS FOR BUILDINGS & OTHER STRUCTURES

ACI - ACI 318-11 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

AISC - MANUAL OF STEEL CONSTRUCTION - 14TH EDITION

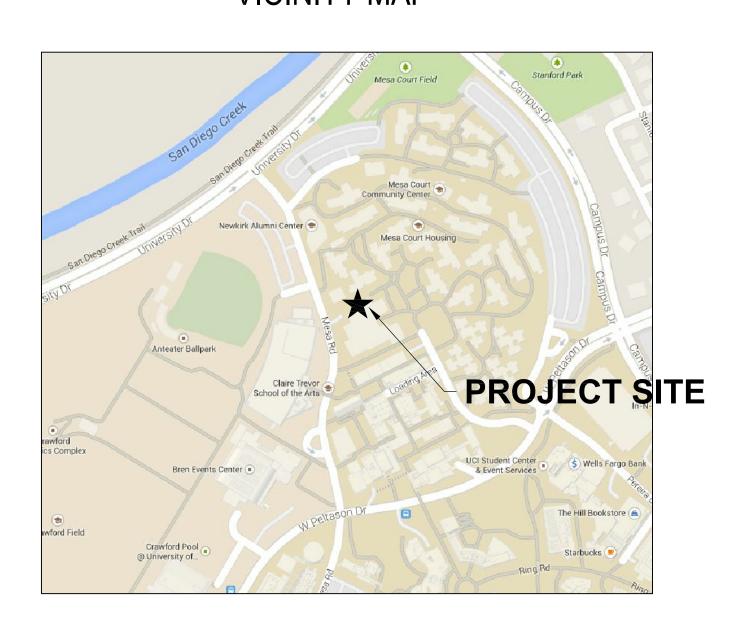
AISC - ANSI/AISC 360-10 - SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS

PCI - PCI DESIGN HANDBOOK - 7TH EDITION

II. SPECIFICATIONS
SEE SHEETS PC1.1

DESIGN CRITERIA

VICINITY MAP



OWNER
University of California, Irvine
5201 California Ave Suite 250
Irvine, CA 92697

GENERAL CONTRACTOR
Hensel Phelps
18850 Von Karman Ave
Irvine, CA 92612

ARCHITECT
Mithun, Inc.
Pier 56, 1201 Alaskan Way, #200
Seattle, WA 98101

STRUCTURAL ENGINEER

DCI Engineers

101 W Broadway, #1260
San Diego, CA 92101

X.10.2



UCI Mesa Court Expansion Structural Submittal

THIS SUBMITTAL CONTAINS STRUCTURAL DETAILS & CALCULATIONS FOR:

GFRC Panels and Connections

SUBMITTED: 12/24/2014 RESPONSE DUE: 1/14/2015 Note: See sheet PC8.1 for detai change per RFI 1334. MRD 1.25.2014

ENGINEERS REVIEW

DCI ENGINEERS

____ No Exceptions Taken

____ Note Markings

____ Revise & Resubmit

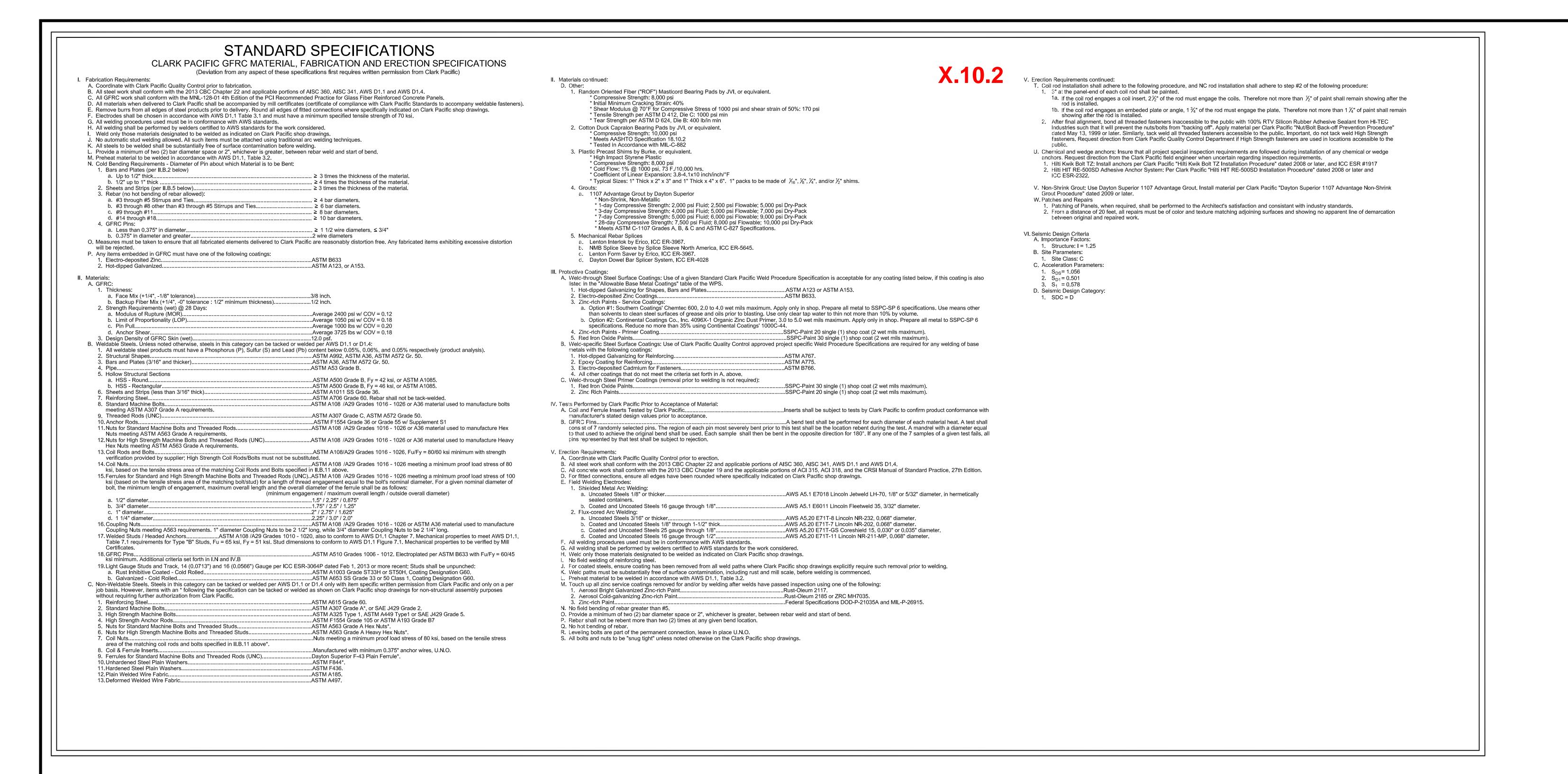
By: ___ NF ___ Date: ____ 01/19/2015

ENGINEER'S REVIEW IS FOR GENERAL CONFORMANCE TO THE DESIGN CONCEPT AND CONTRACT DOCUMENTS. REVIEW OF THE SPECIALTY STRUCTURAL ENGINEERS (SSE) DESIGN IS FOR CONFORMANCE TO DESIGN CRITERIA AND COMPATIBILITY WITH THE DESIGN OF THE BUILDING AND DOES NOT RELIEVE THE SSE OF RESPONSIBILITY FOR THAT DESIGN. MARKINGS OR COMMENTS SHALL NOT BE CONSTRUED AS RELIEVING THE CONTRACTOR FROM COMPLIANCE WITH THE PROJECT PLANS AND SPECIFICATIONS, NOR DEPARTURES THEREFROM. THE CONTRACTOR REMAINS RESPONSIBLE FOR DETAILS AND ACCURACY; FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS; FOR SELECTING FABRICATION PROCESSES; FOR TECHNIQUES OF ASSEMBLY; AND FOR PERFORMING WORK IN A SAFE MANNER.

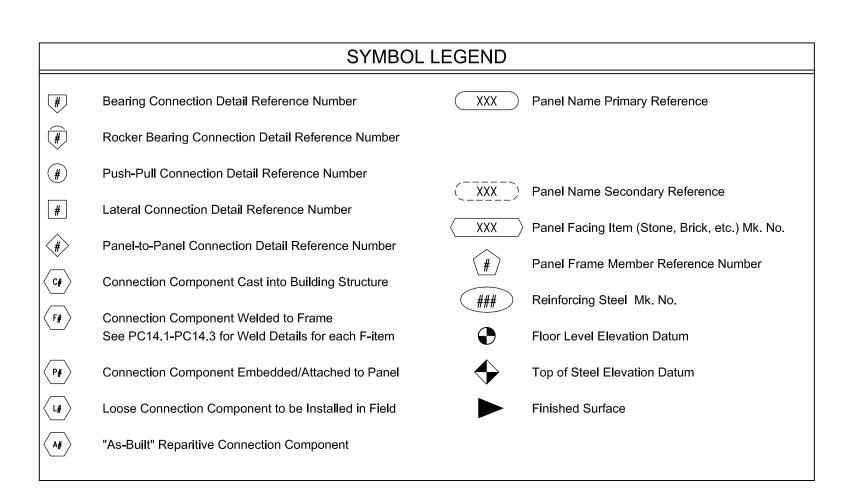
VERIFY ALL DIMENSIONS WITH ARCH.

SUBMITTAL REVIEWED FOR COMPLIANCE OF PANEL CONNECTIONS TO EMBEDS ONLY. PROVIDE CALCULATIONS AND SHOP DRAWINGS FOR PANEL FRAME MEMBERS FOR FUTURE REVIEW.

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PC1.0 PC1.1		Cover Sheet Precast Specifications					ast.					
PC1.2	\bigcirc	Standard Details				'SA	SOL CRA	MEN	ITO,	CA	956	
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PC2.4-S	\triangle	Floor Plan - South - Level 4			©							_
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PC4.2 PC4.3		Interior Elevations - Middle B Interior Elevations - South Bu										
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PC10.1		GFRC Connections										
PC10.1		GFRC Connections GFRC Connections										
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		Α	BBREVIATIONS		
Ang	Angle	Elev	Elevation	NS	Nelson Stud
Ang Pt	Angle Point	Emb	Embed	NTS	Not to Scale
Arch	Architect, Architectural	EOC	Edge of Concrete	OC	On Center
Btm	Bottom	EOP	End/Edge of Panel	ОН	Opposite Hand
во	Bottom of	EOS	Edge of Slab/Structure	Opng	Opening
BOC	Bottom of Concrete	FF	Finish Floor	PL	Plate
BOP	Bottom of Panel	FOC	Face of Concrete	Pt	Point
BOS	Bottom of Slab/Structure	FOP	Face of Panel	Reinf	Reinforcement
CIP	Cast in Place	FOS	Face of Structure	Ref	Reference
CL	Center Line	Ga	Gauge	RO	Rough Opening
Clr	Clear	GC	General Contractor	SAD	See Architectural Drawings
Conc	Concrete	Gr	Grade	SEOR	Structural Engineer of Record
Cond	Condition	HAS	Headed Anchor Stud	Sim	Similar
Conn	Connection	HSS	Hollow Structural Section	Str	Structure, Structural
D & T	Drilled and Tapped	Ins	Insert	TO	Top of
Desc	Description	Jt	(Panel) Joint	TOC	Top of Curb/Concrete
Det	Detail	L	Length	TOP	Top of Panel
Dia	Diameter	Loc	Location	TOS	Top of Steel/Structure
Dim	Dimension	Max	Maximum	TS	Tube Steel
Dims	Dimensions	Min	Minimum	Тур	Typical
Dim Pt	Dimension Point	Mk	Mark	UNO	Unless Noted Otherwise
Dwgs	Drawings	No	Number	WP	Work Point
EBF	Eccentrically Braced Frame				





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UCI Mesa Court Expansion

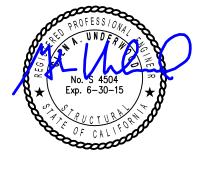
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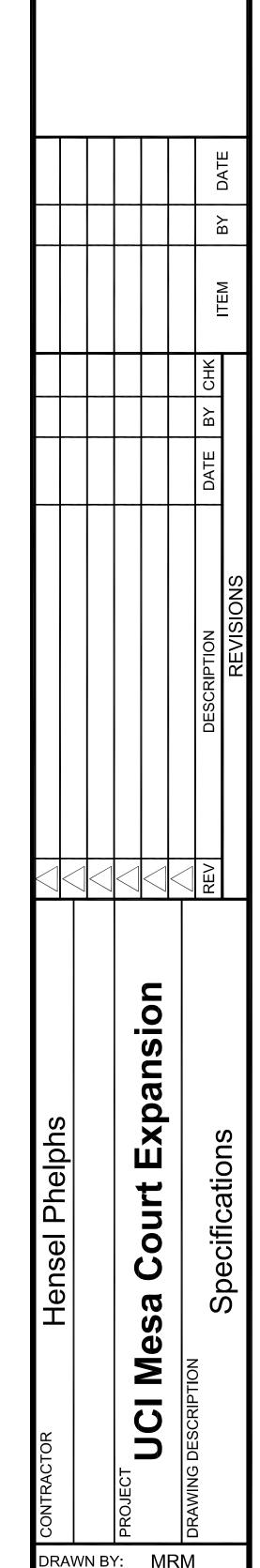
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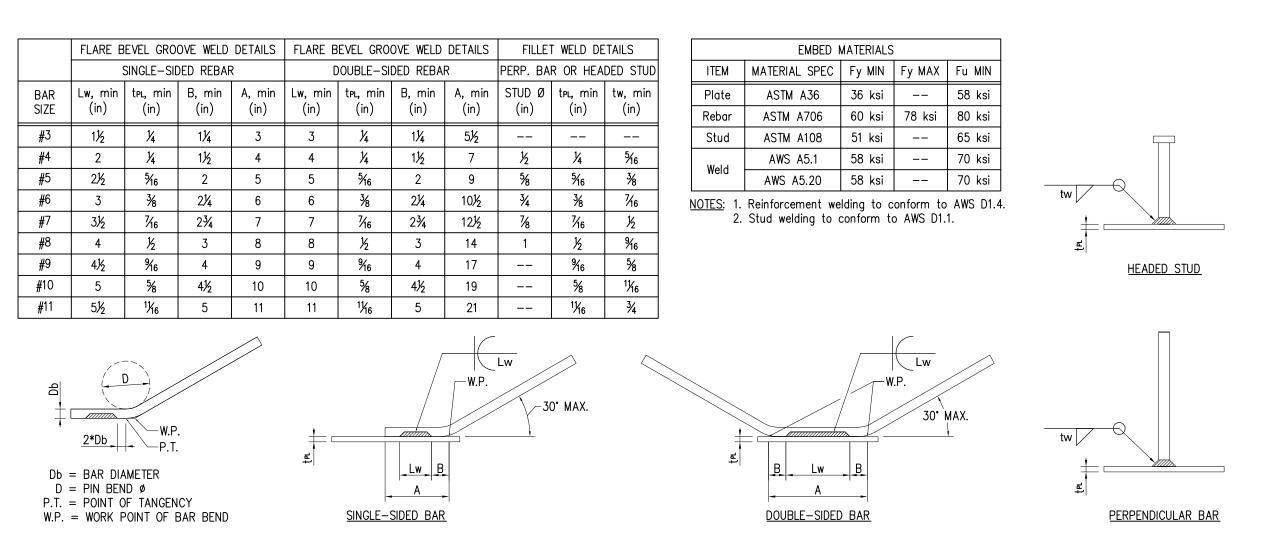
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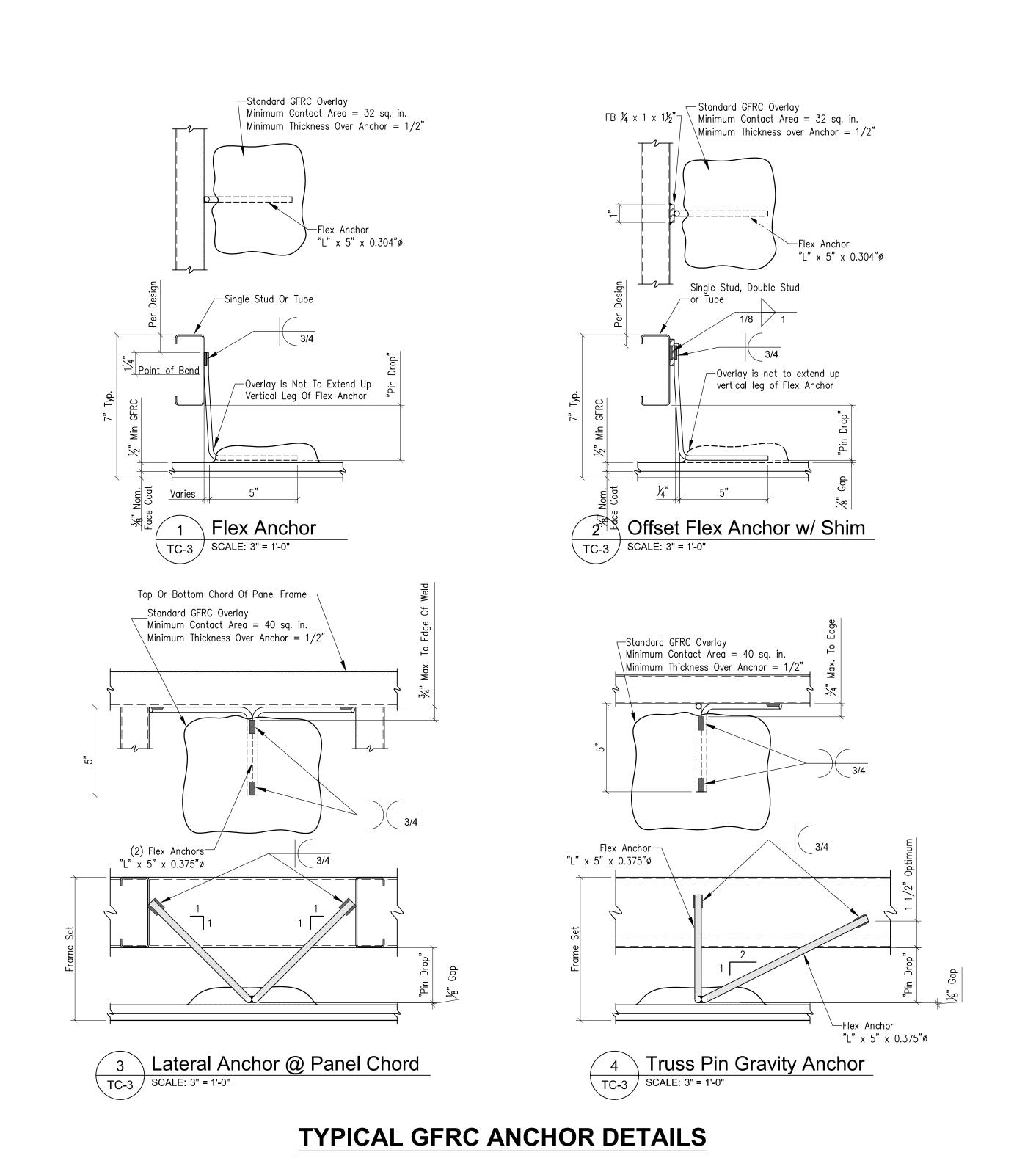


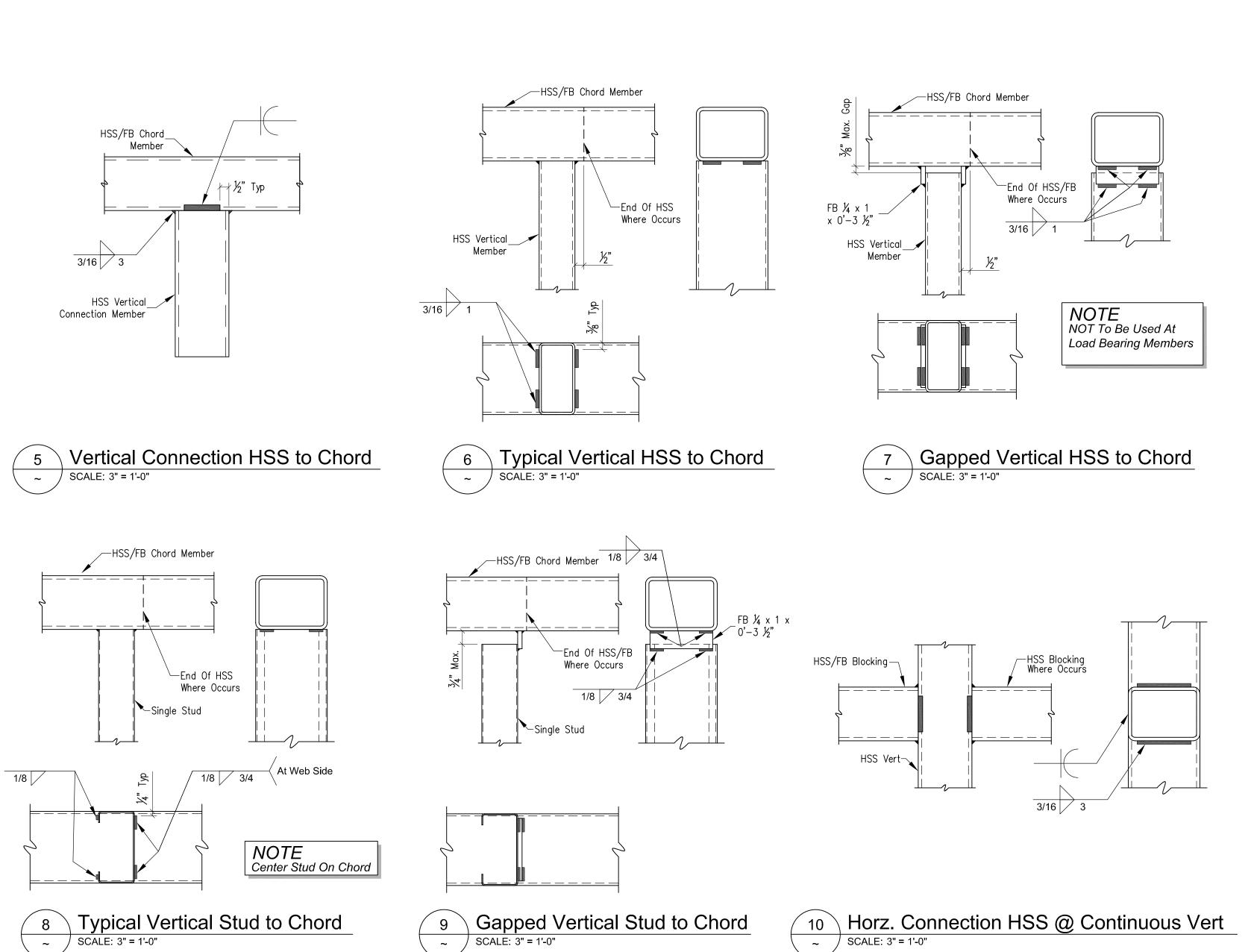


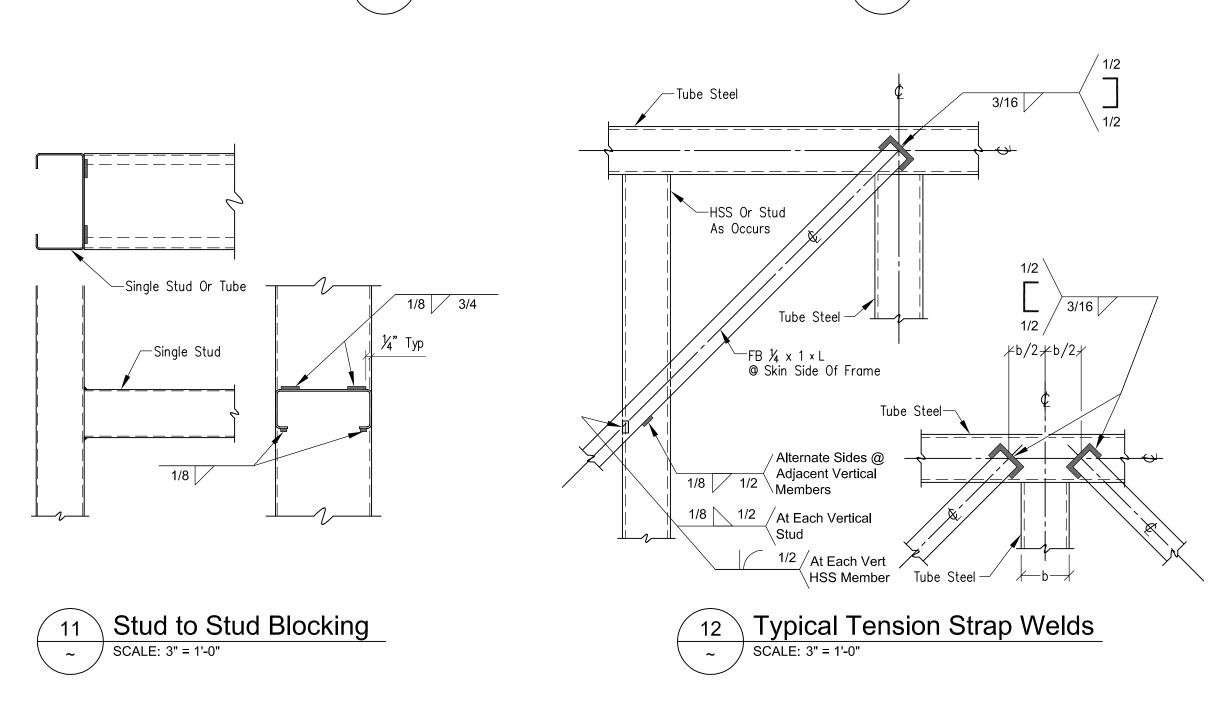
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CONNECTION EMBED REBAR & HEADED STUD WELDING DETAILS







TYPICAL GFRC FRAME WELDING DETAILS

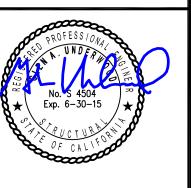


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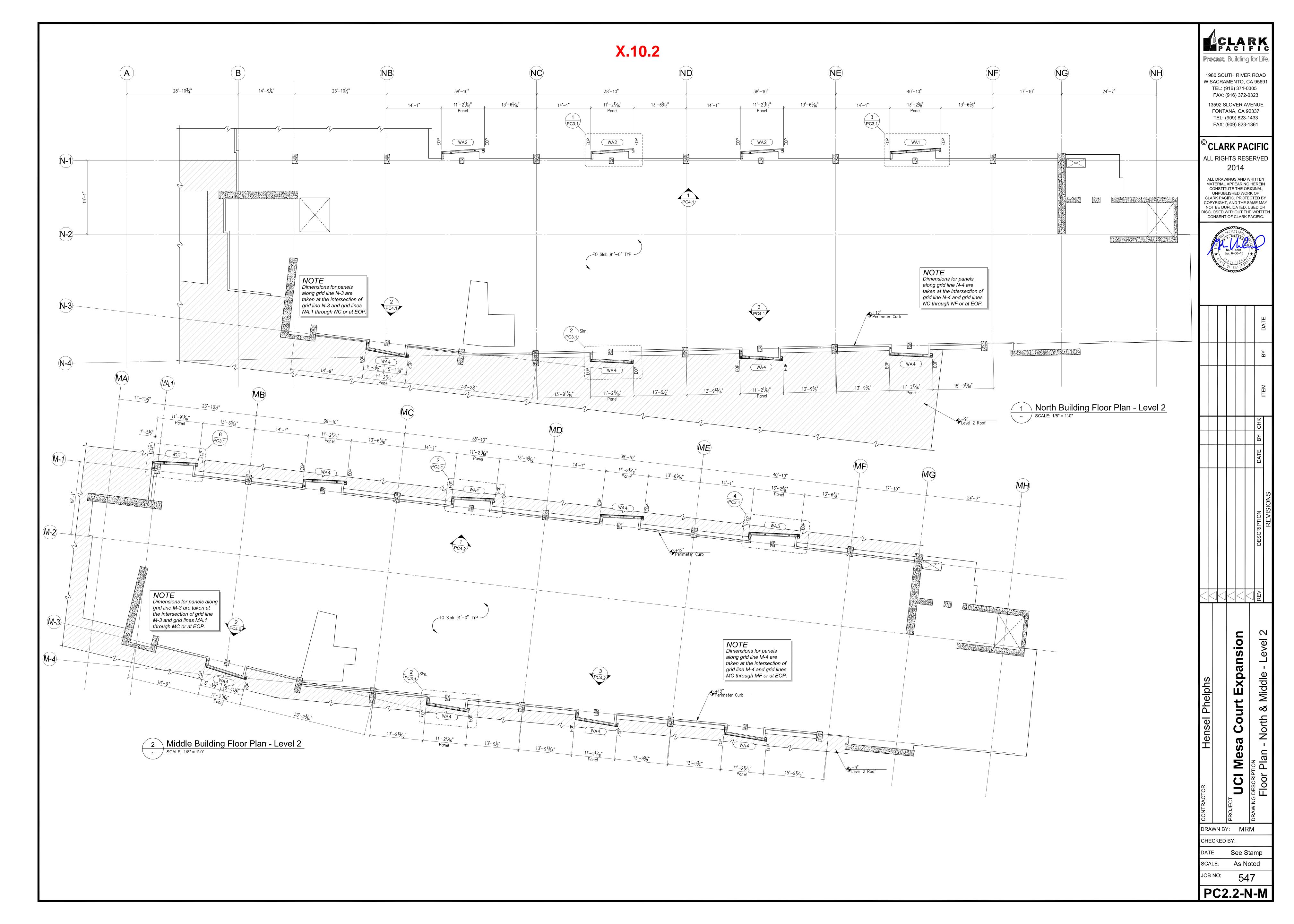
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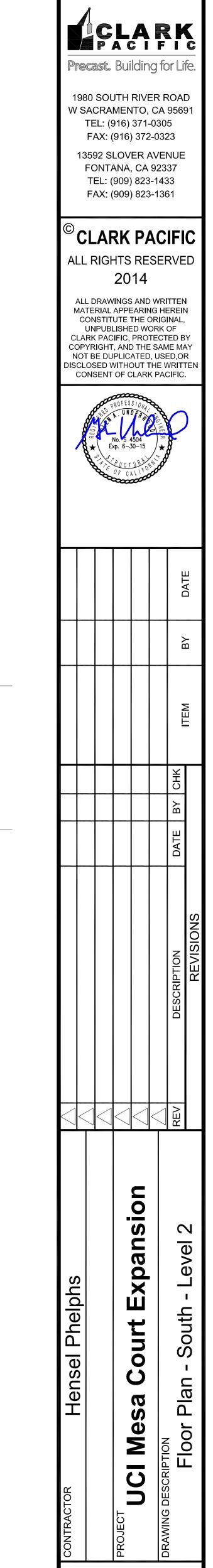
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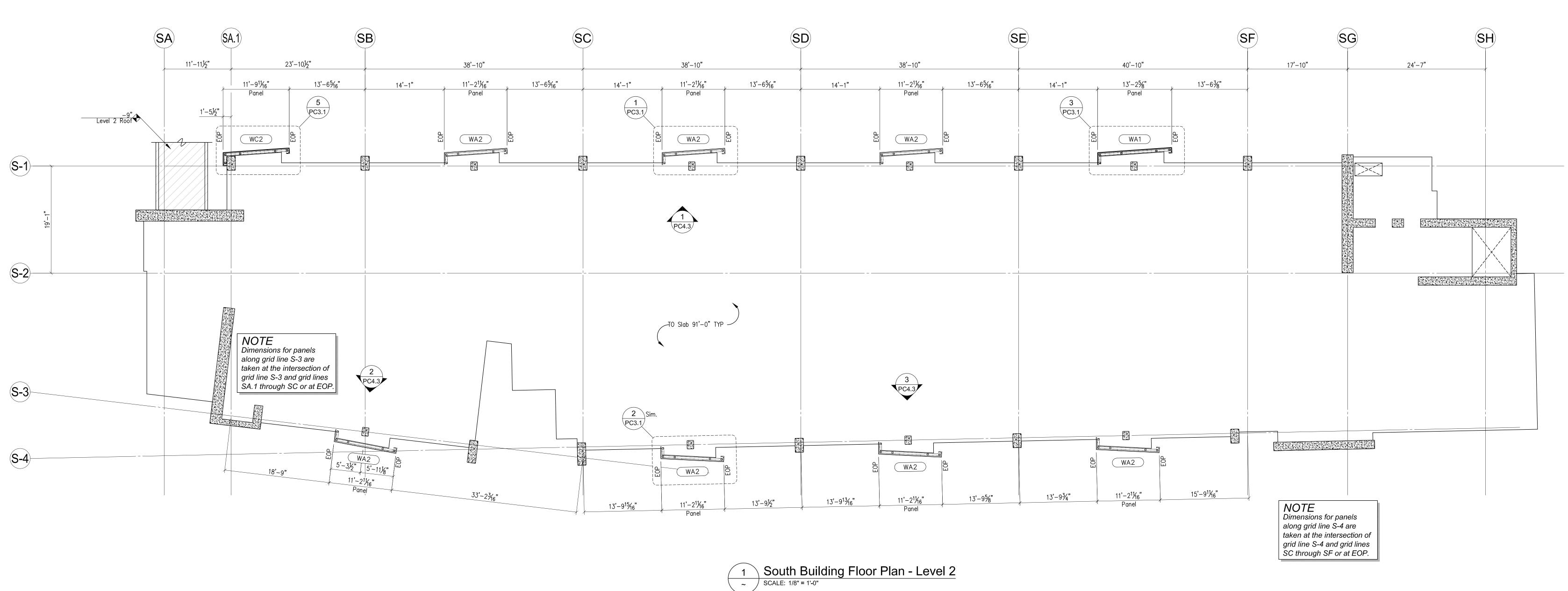
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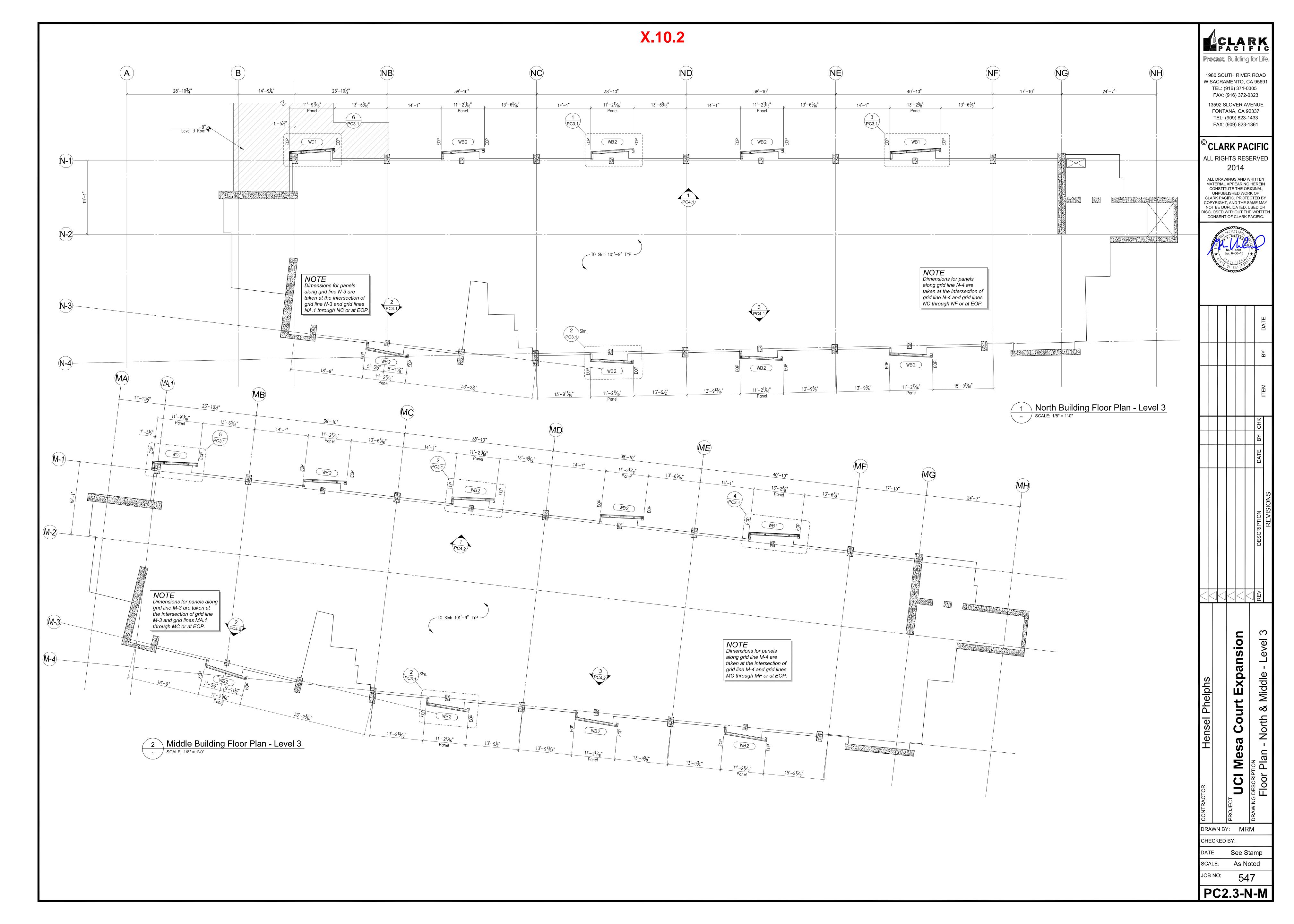
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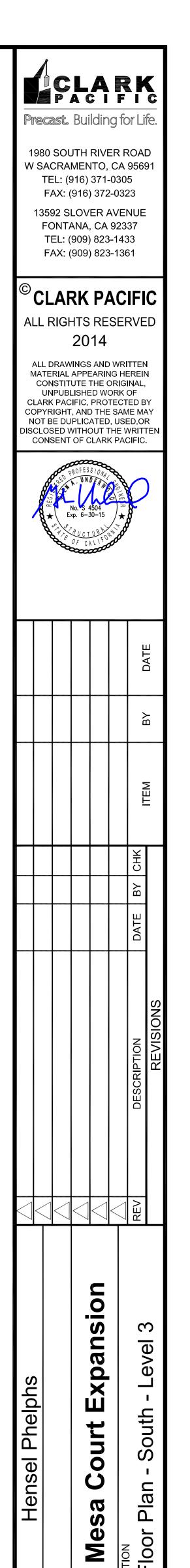
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PC2.2-S







Mesa Court Expansion

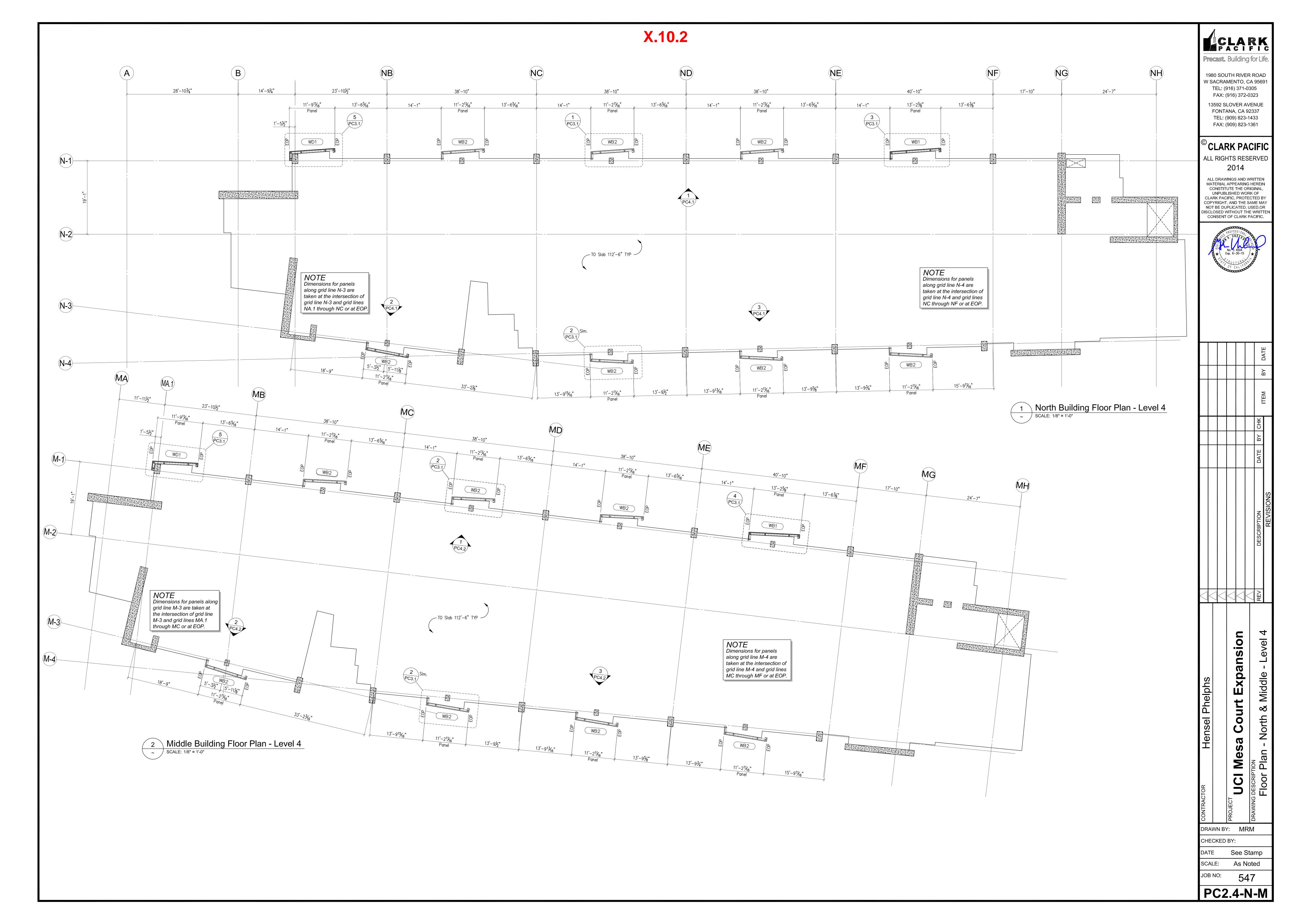
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PC2.3-S

23'-10½" 11'-11½" 38'-10" 38'-10" 40'-10" 24'-7" 17'-10" 13'-6⁵⁄₁₆" 13'-6⁵⁄₁₆" 11'-2¹⁄₁₆" Panel 13'-6⁵⁄₁₆" 13'-6⁵⁄₁₆" 13'-6³/₈" 14'-1" S-1 S-2 NOTE
Dimensions for panels along grid line S-3 are taken at the intersection of grid line S-3 and grid lines SA.1 through SC or at EOP. S-3 **S-4** WB2 WB2 15'-9¹⁄₁₆" 11'-2¹⁄₁₆" Panel 13'-9¹³/₁₆" NOTE
Dimensions for panels
along grid line S-4 are
taken at the intersection of
grid line S-4 and grid lines
SC through SF or at EOP. South Building Floor Plan - Level 3

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

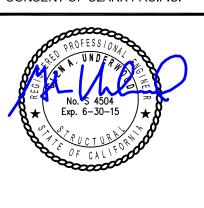


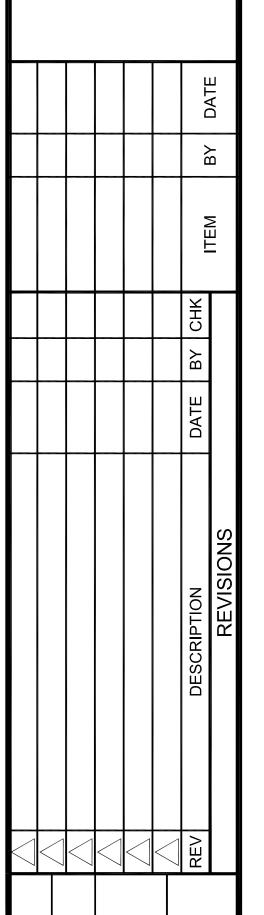


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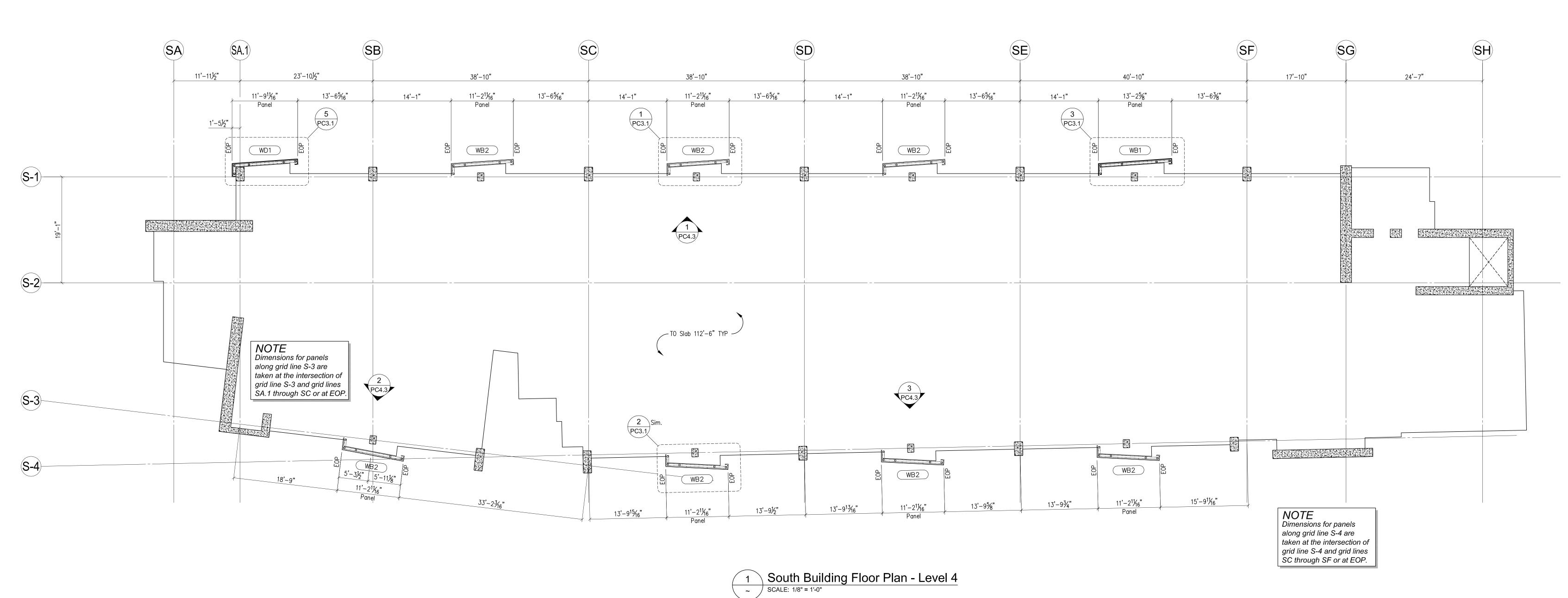
Mesa Court Expansion

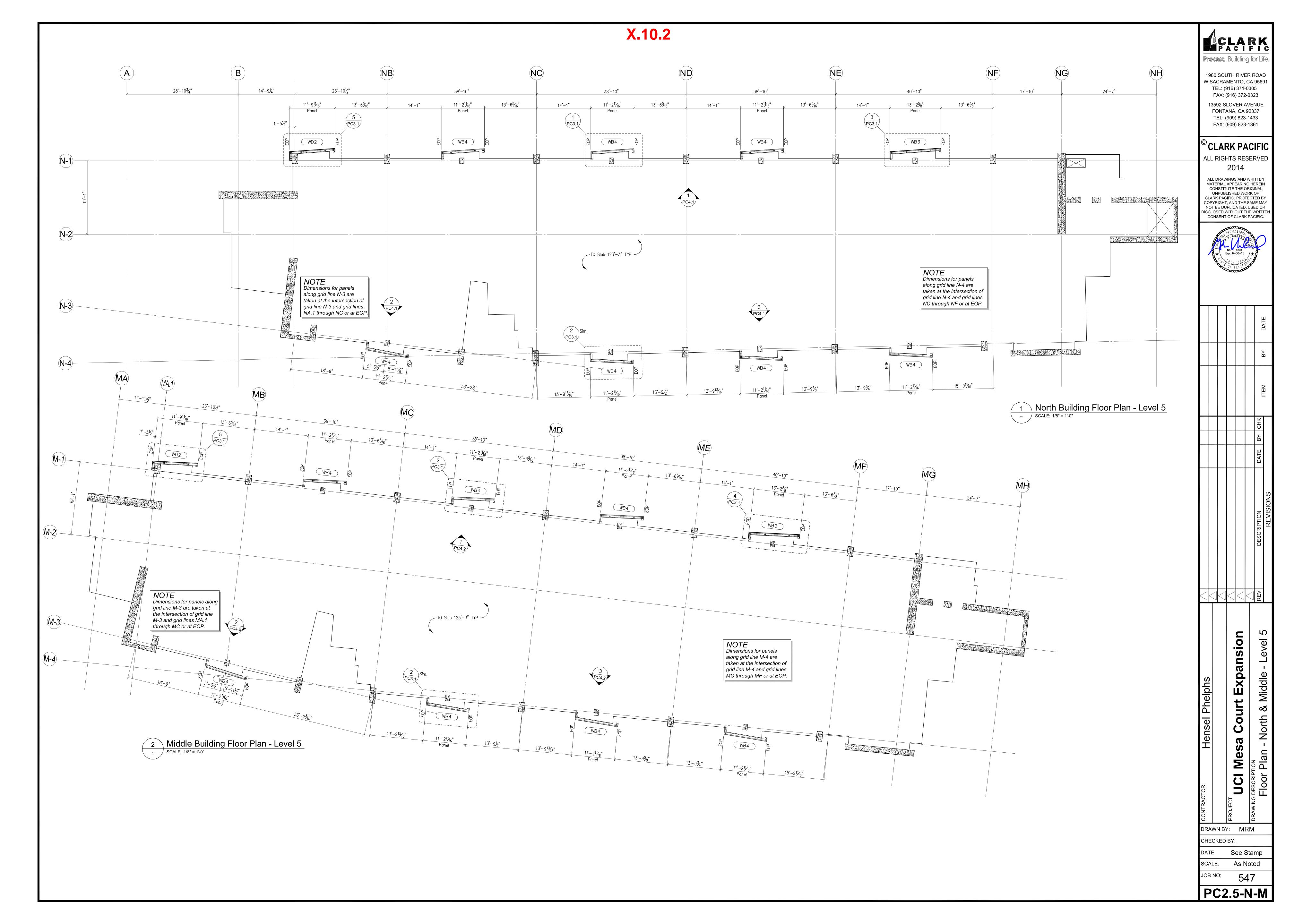
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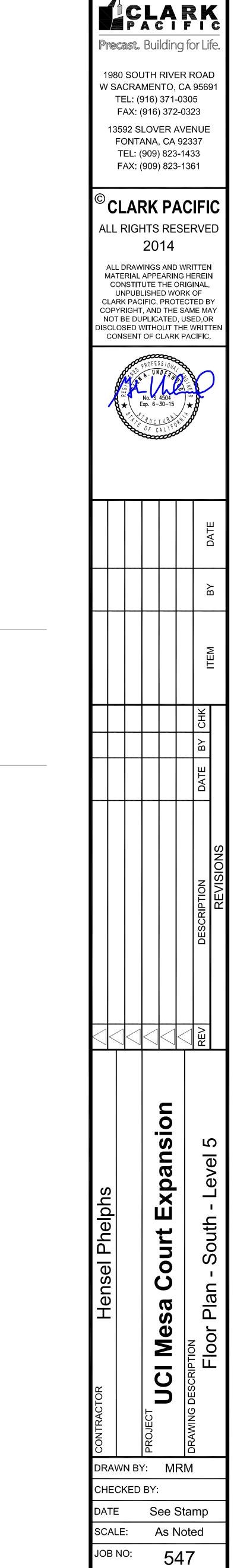
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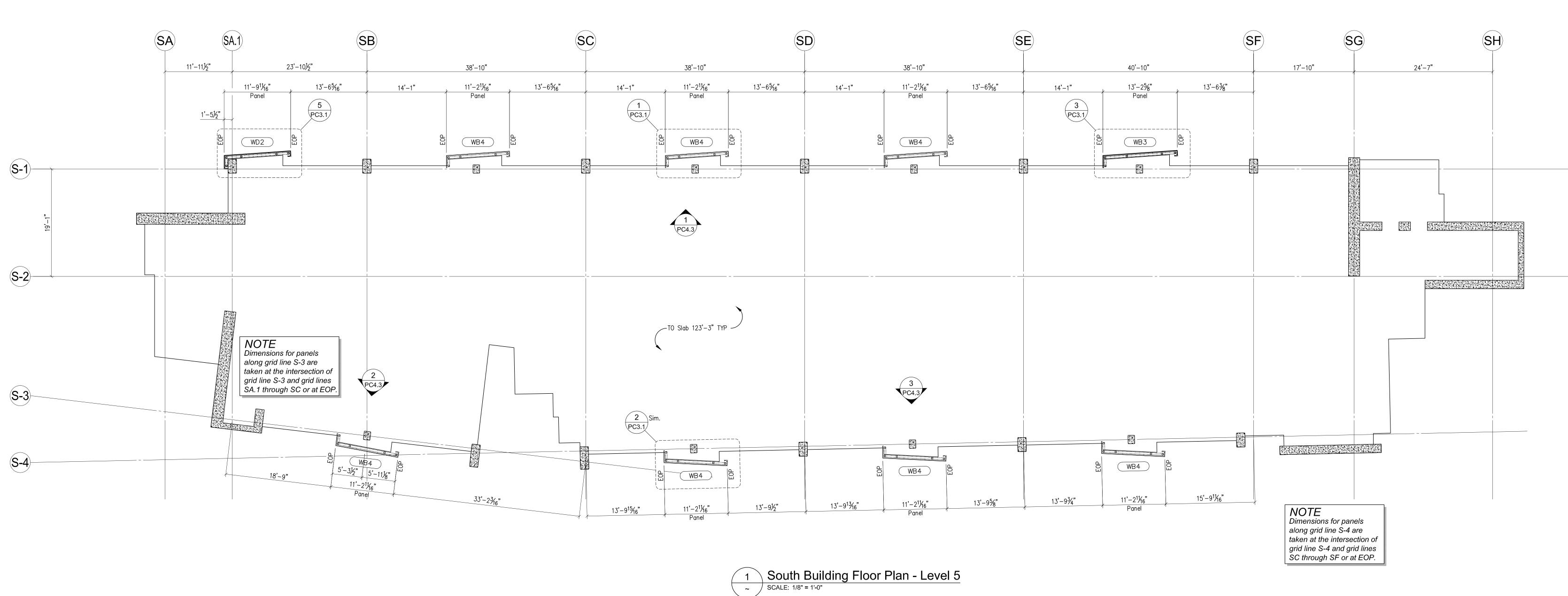
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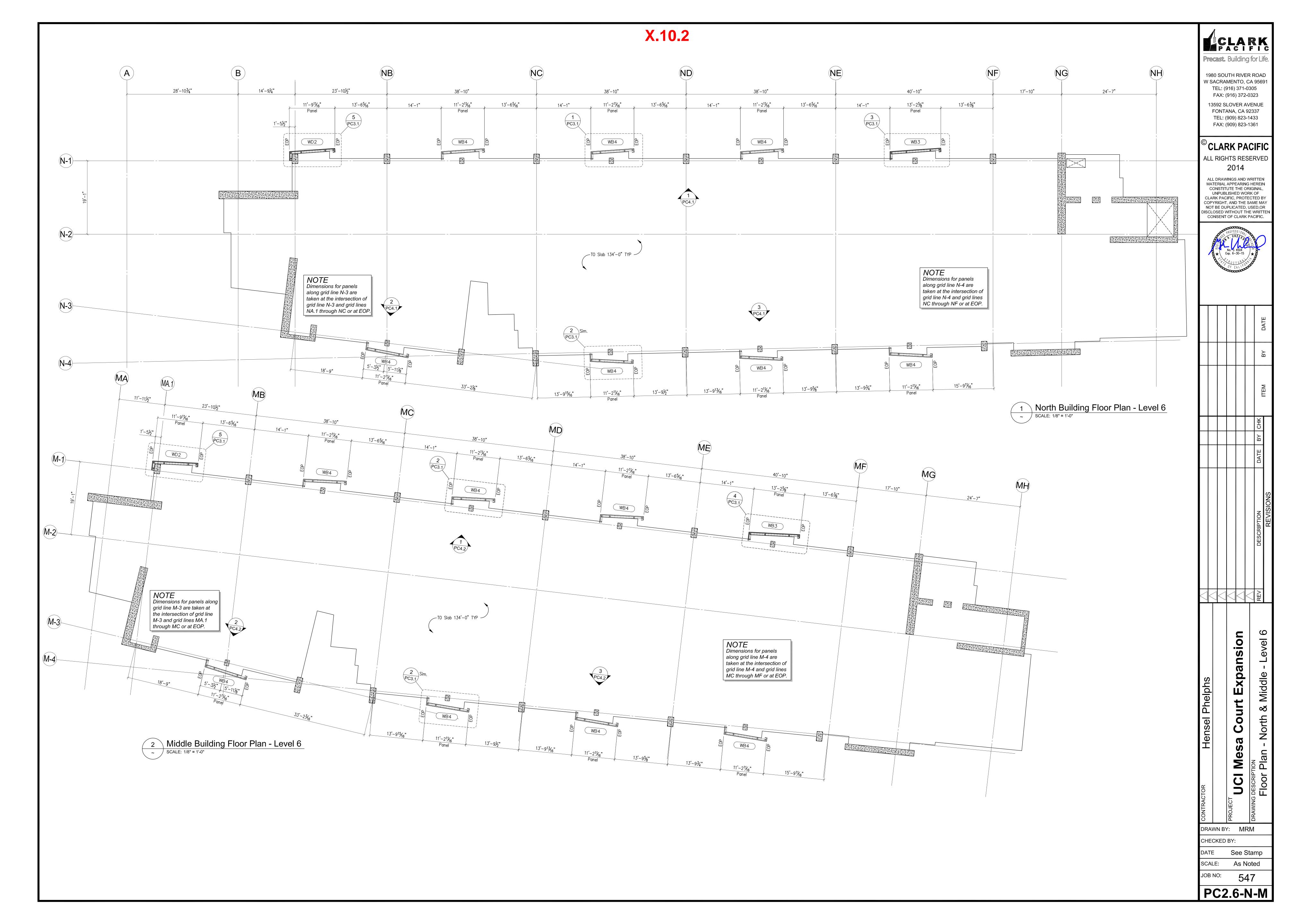


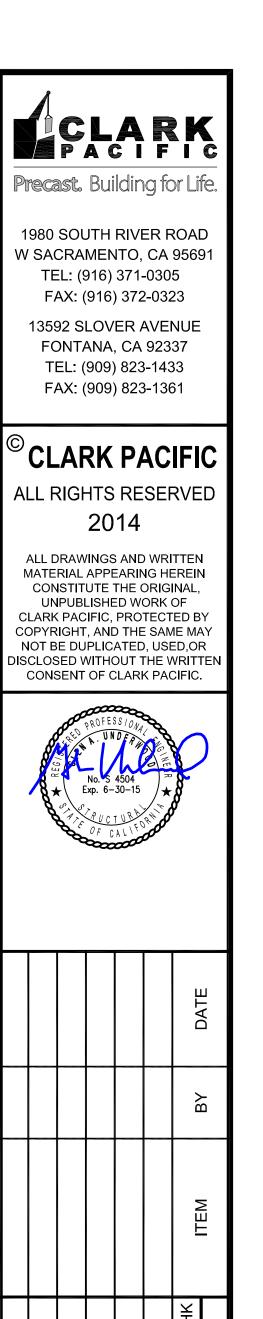


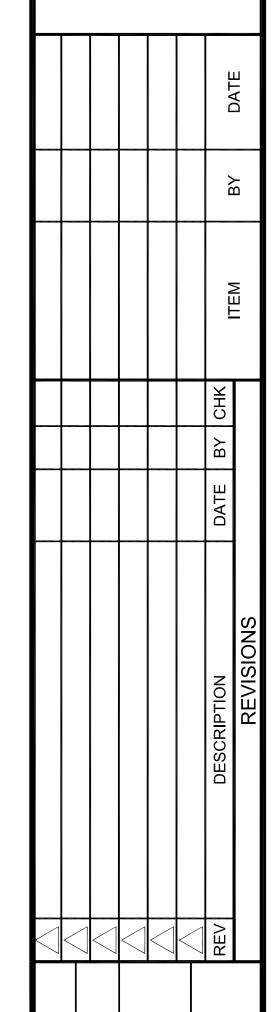


PC2.5-S









Mesa Court Expansion

loor Plan

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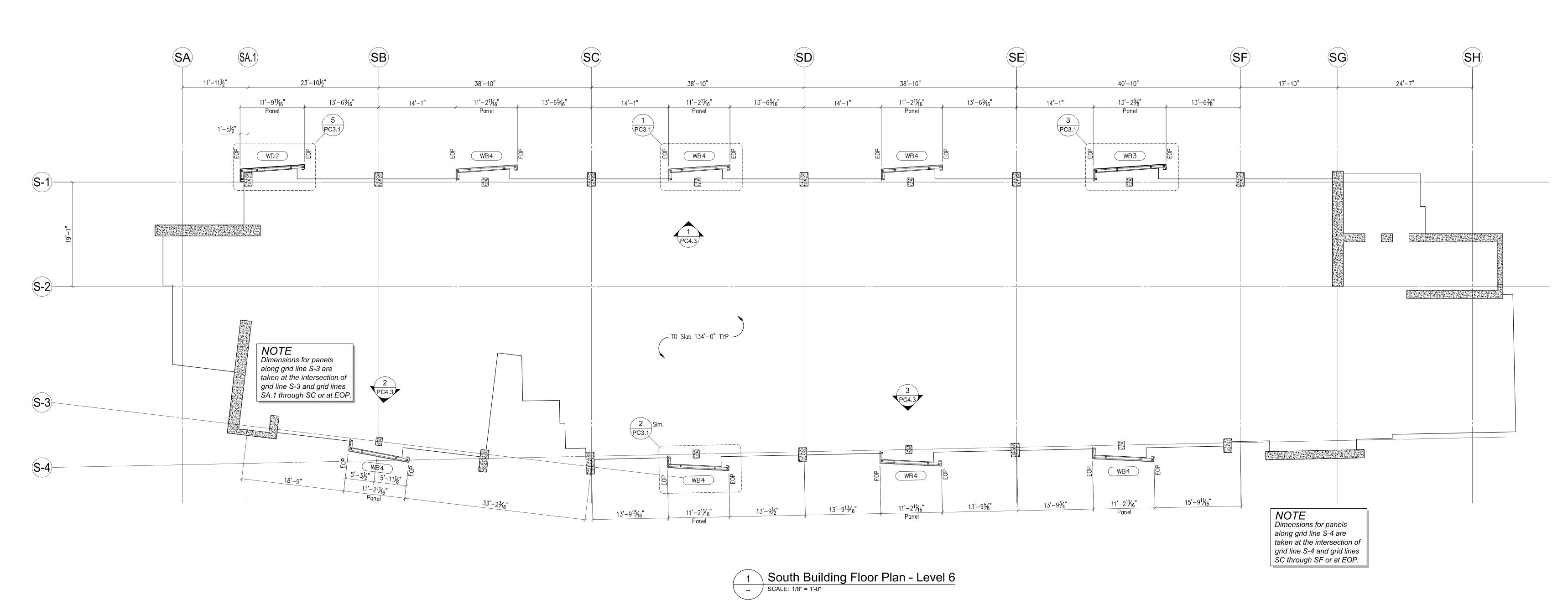
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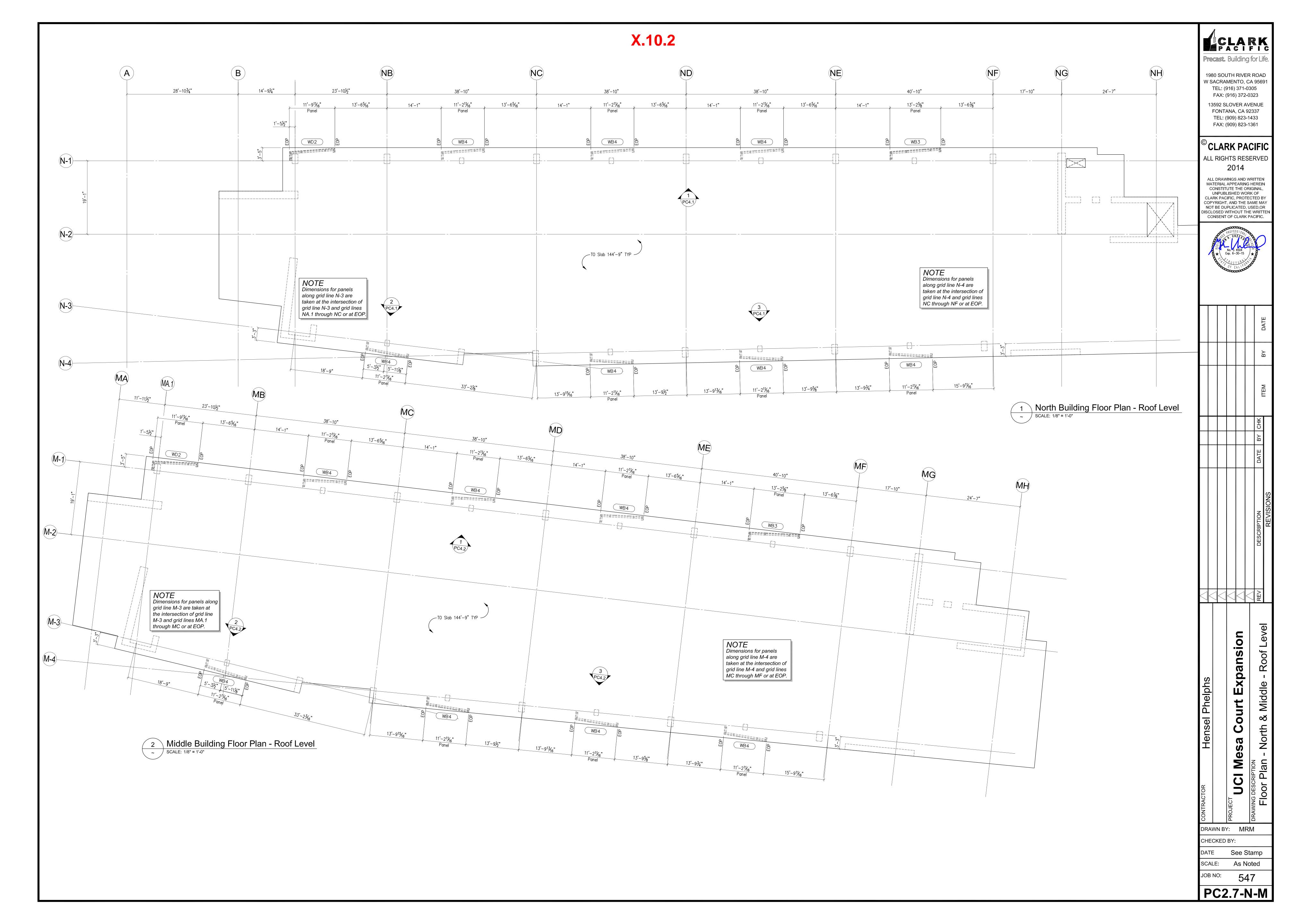
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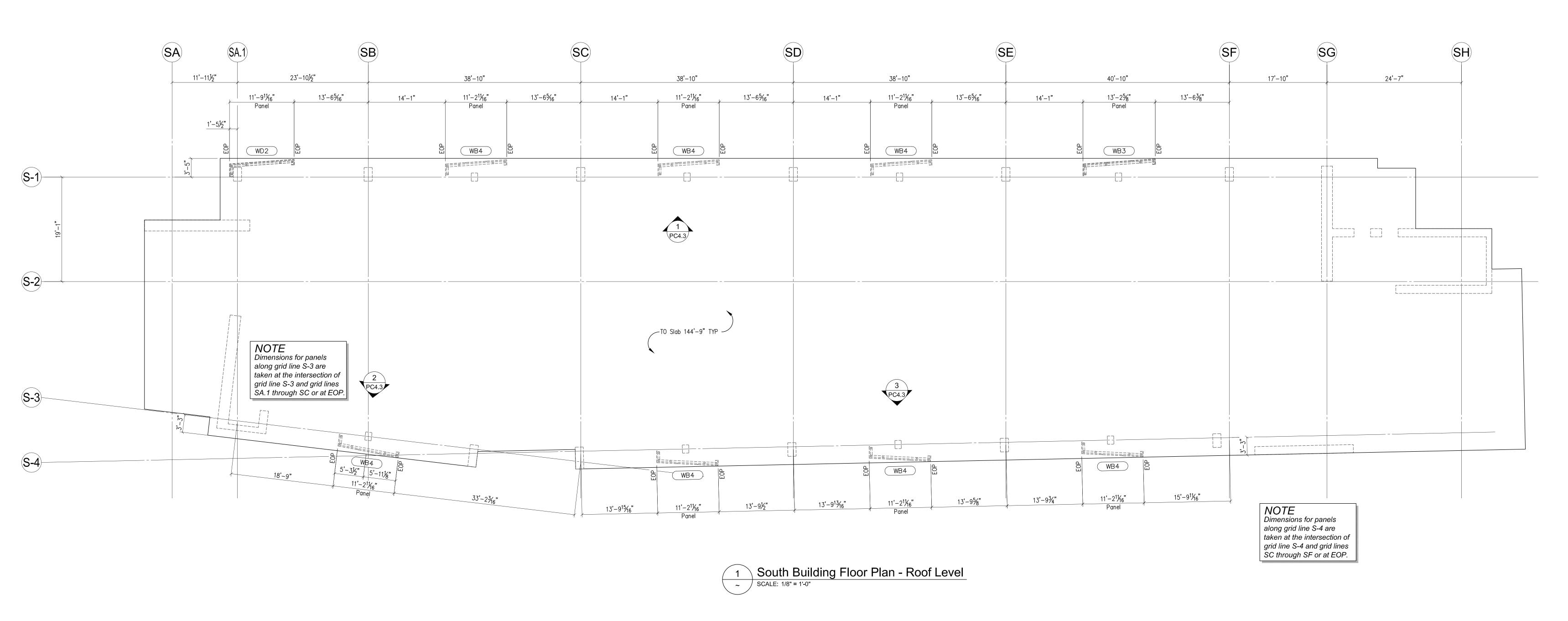
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PC2.6-S







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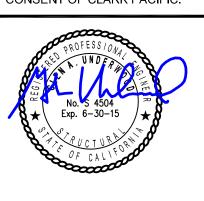
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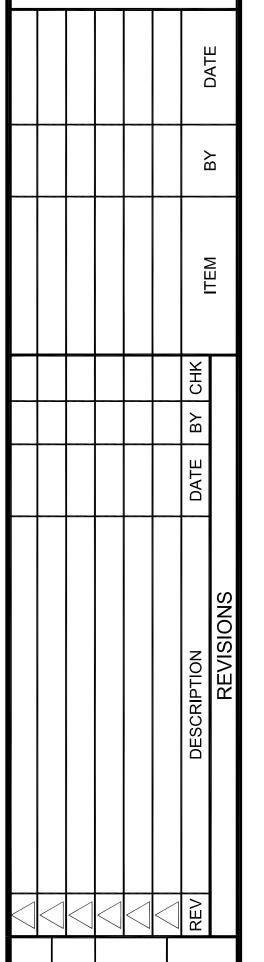
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Hensel Phelphs

Mesa Court Expansion

or Plan - South - Roof Level

ONTRACTOR
ROJECT
UCI N

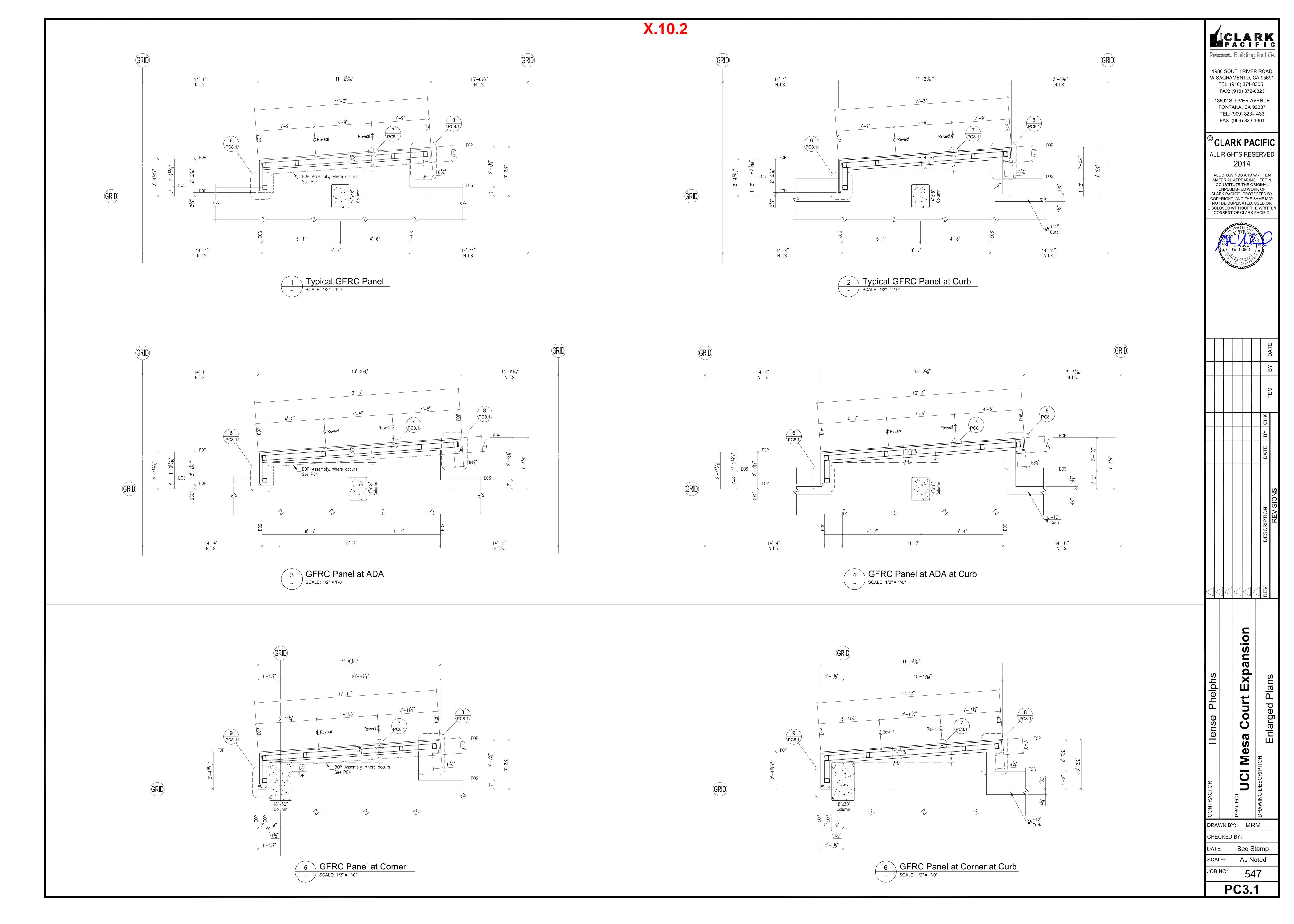
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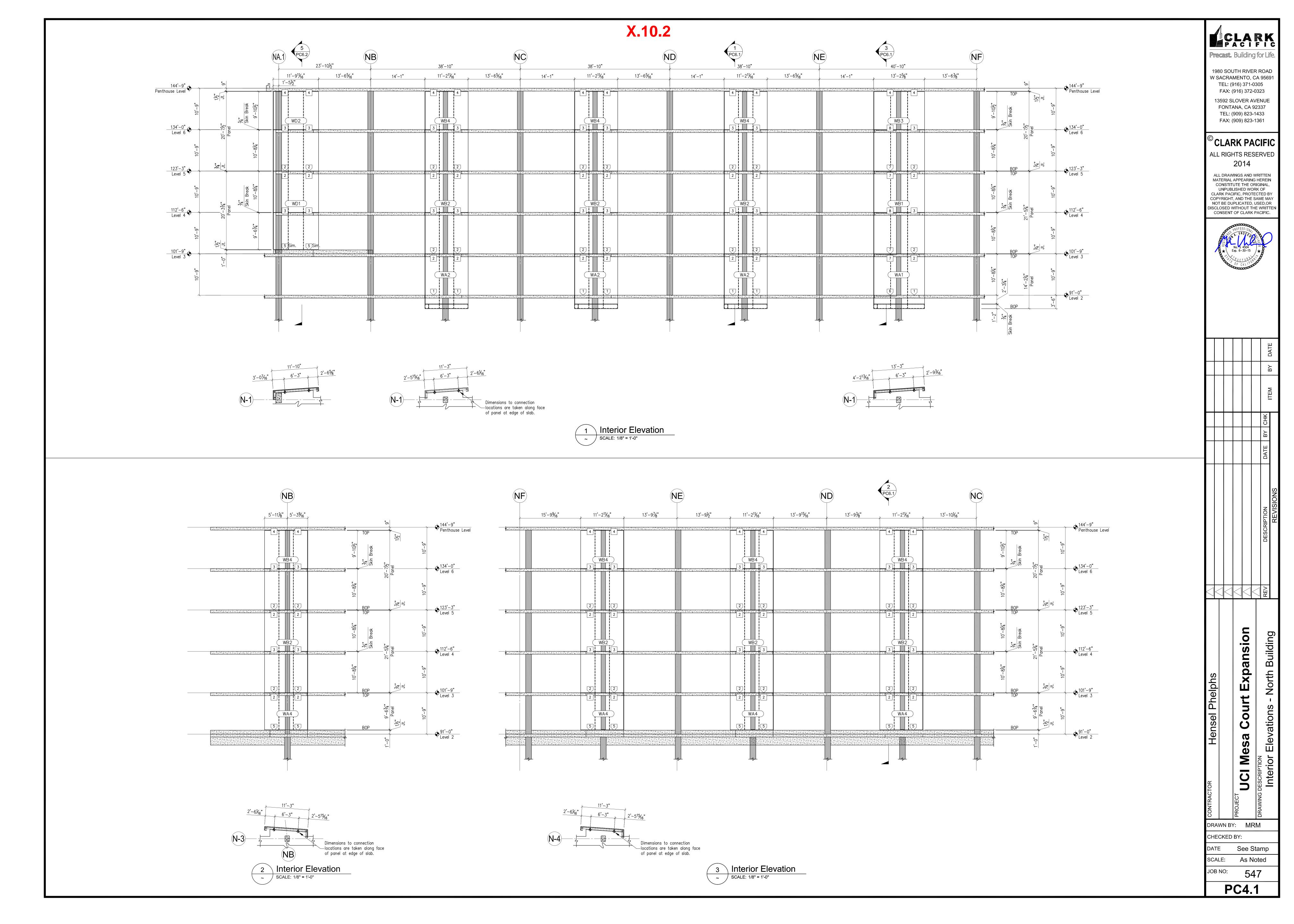
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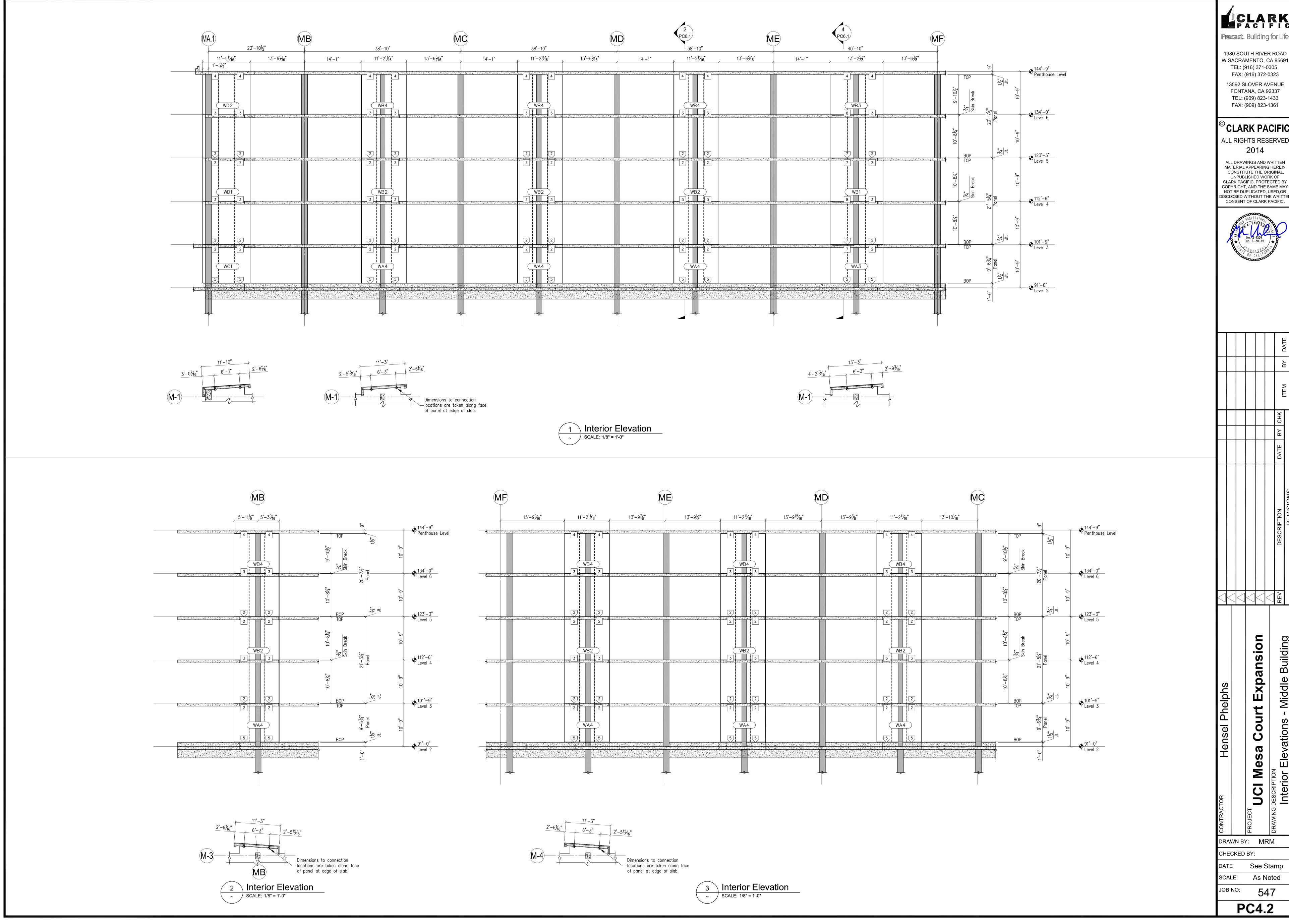
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SCALE: As Noted

DB NO: 547

PC2.7-S







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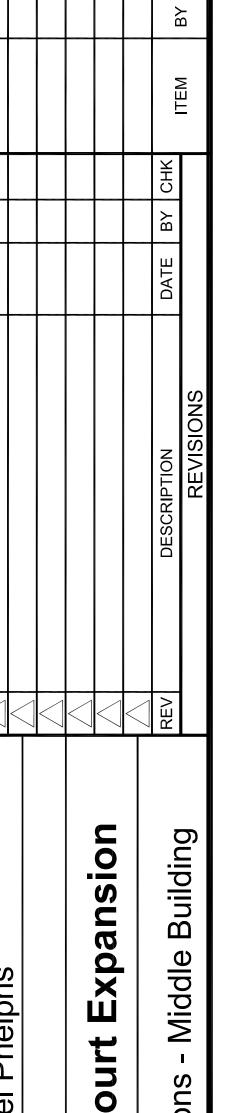
Precast. Building for Life.

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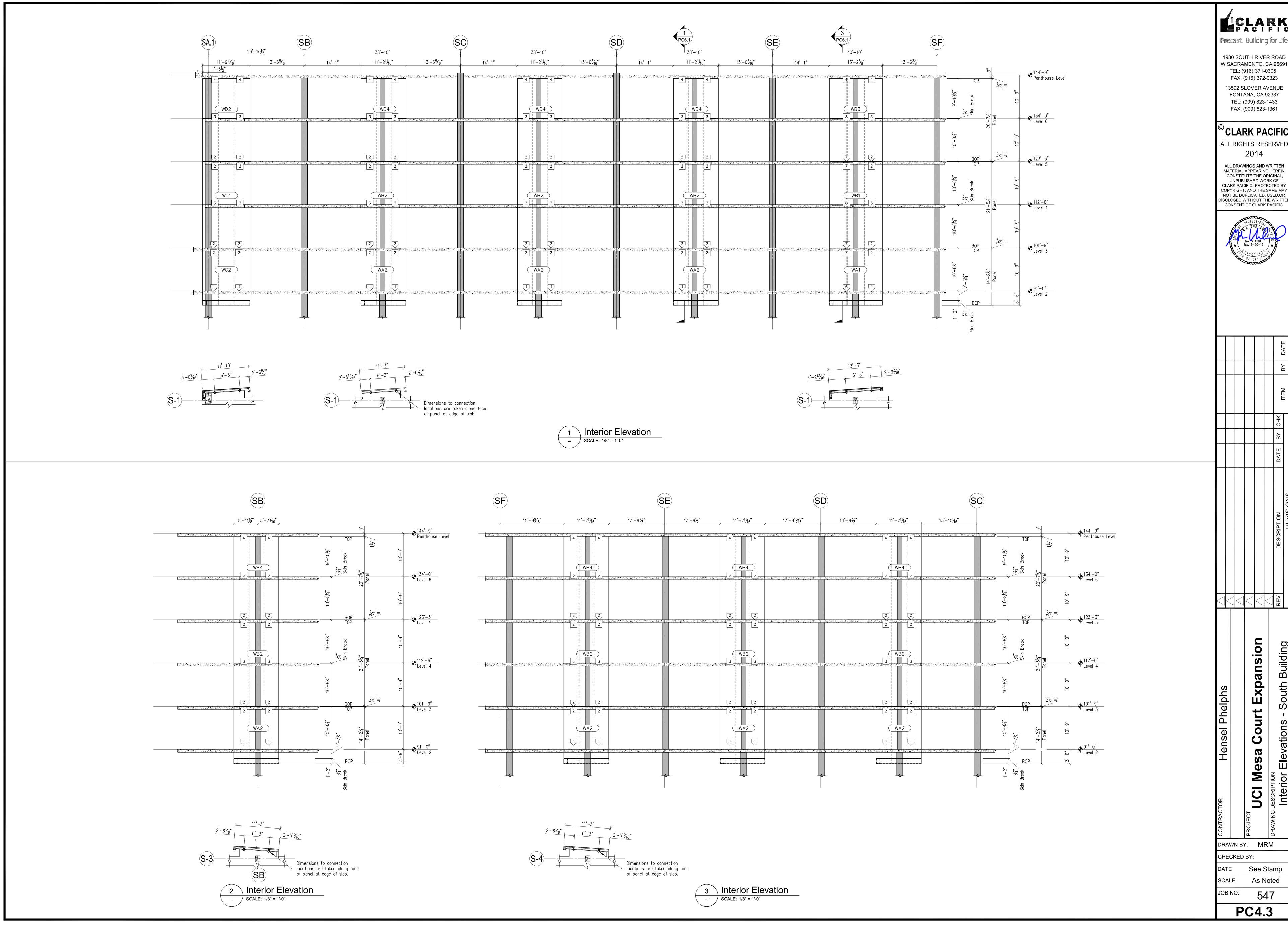
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JOB NO: 547

PC4.2



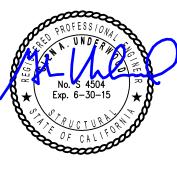
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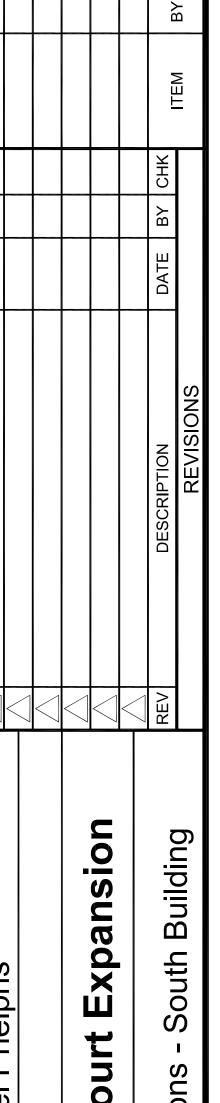
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PC4.3