

STEEL MODULAR CONSTRUCTION: COST & SCHEDULE ANALYSIS

Market Rate Housing

September 2021





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I. PROJECT APPROACH



With ever-increasing construction costs driven by labor shortages and material cost escalations, developers are evaluating alternative means of construction to enable developments to “pencil”. Modular/offsite/industrialized construction is often considered; however, the question of “what time and cost savings could we achieve by going modular” is typically met with either a range of percentages or “it depends”.

Optimum Modular Solutions, an independent, third-party modular consulting firm, has assembled, coordinated, and collaborated with KTGy, C.W. Driver and Englekirk to prepare a conceptual design, ROM budget and schedule for a “missing middle” market rate housing project based on a steel volumetric modular system. A separate conceptual ROM budget and schedule was prepared based on conventional Type III construction and the comparison of modular vs. conventional costs and schedule were developed.

Onsite construction costs, building codes and seismic requirements vary per city and state; however, the basis of this study assumes a typically-sized downtown Los Angeles, California site with no significant topography issues or environmental remedial work. The site is assumed to be a vacant lot with minimal demolition requirements.

As is typical for most developments of this type, prevailing wages relating to the onsite work have been applied (prevailing wages do not apply to the modular fabrication completed offsite).

To maximize building height and density, steel volumetric modules have been utilized to allow for six (6) stories of residential over the concrete podium level (wood volumetric modules cannot exceed five (5) stories; therefore, one extra podium level would be required, which would increase the amount of onsite work and require one story of conventionally-constructed units onsite). Parking stackers are utilized in lieu of additional levels of parking.

There are several ways to design and construct steel volumetric modular projects and manufacturers have their preferences on chassis design, structural systems and connection details. For the purpose of this study, a non-proprietary system has been utilized. Wherever possible, “double-loaded corridor modules” (modules that include half of a unit either side of a portion of the corridor) have been used and based on the size of the units and unit mix, the modules vary in size. Alternative designs could reduce onsite work along the mate lines within the units; however, would have potential trade-offs on the lengths of the units, other onsite work and transportation costs and logistics.

Concrete cores are utilized to carry lateral loads, which can be pre-cast or poured-in-place. Steel braced-framed cores are an alternative option; however, require multiple structural, fire proofing, framing and finish trades to complete. Light gage sheet metal sheer wall panels applied to the steel modules within the factory could be utilized in lieu of structural cores for limited height structures.

This study assumes that a portion of the exterior façade system is site-installed by the general contractor, after the modules have been set. As much of the façade system as possible is installed with the modules.

For optimum efficiency and to greatly reduce the time taken to “dry-in” the building after the last unit modules have been set, prefabricated roof modules with rigid insulation, cover board, membrane and parapet walls are used as a basis for this study. Only minimal mate line and seam work would be required to be completed onsite by the general contractor.

The information contained within this document should be considered a guide to modular design, pricing and scheduling and is not intended to be a definitive solution, as there are multiple factors that impact projects of this type.

II. PROJECT SAVINGS OVERVIEW

	Conventional Type III over Podium	Steel Volumetric Modular over Podium	Savings	Savings %
Total Project Hard Costs	\$106,086,283	\$92,624,768	\$13,461,515	13%
Cost per Unit	\$414,400	\$361,816	\$52,584	13%
Cost per Gross Floor Area (GFA)	\$413	\$361	\$52	13%
Construction Schedule	22 Months	16 Months	6 Months	27%
Speed-To-Market Savings			\$4,147,410*	

TOTAL COST SAVINGS AND REVENUE CAPTURE BY GOING MODULAR

\$13,461,515 + \$4,147,410

\$17,608,925

* represents 6 months of revenue gained from the compressed construction schedule, using the average rental revenue per month for the Los Angeles market.

III. COST COMPARISON

CONVENTIONAL TYPE III OVER PODIUM

Total Hard Cost Budget	\$106,086,283
Total Construction Cost Per Unit	\$414,400

STEEL VOLUMETRIC MODULAR

On-Site Budget	\$59,229,678
Off-Site Budget	\$33,395,090
Total Hard Cost Budget	\$92,624,768
Total Construction Cost Per Unit	\$361,816

Note: See detailed cost analysis in Appendix

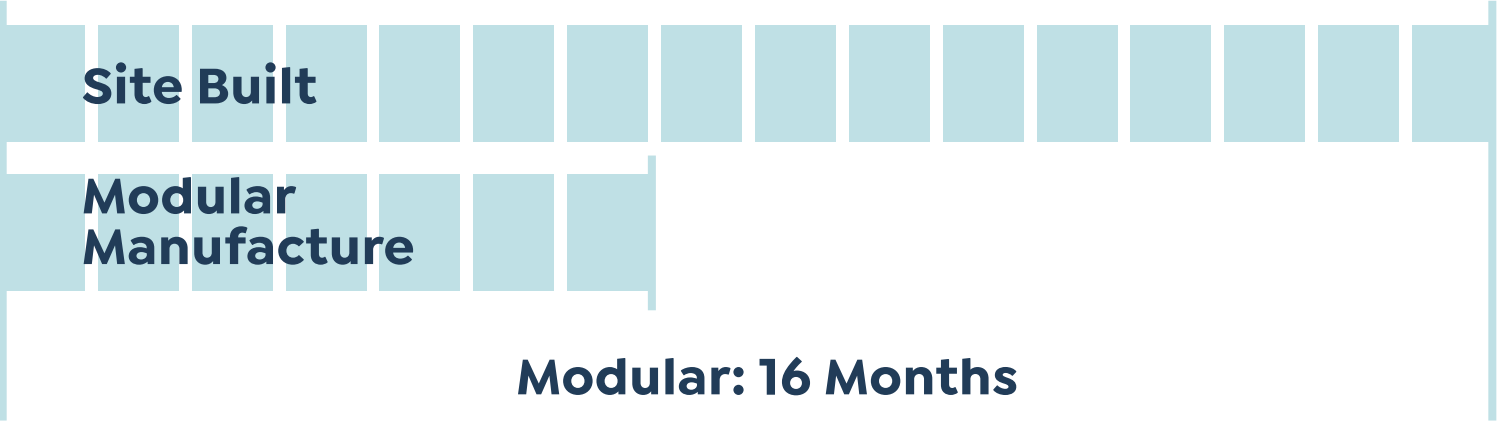


IV. SCHEDULE COMPARISON

CONVENTIONAL CONSTRUCTION DURATION



MODULAR CONSTRUCTION DURATION

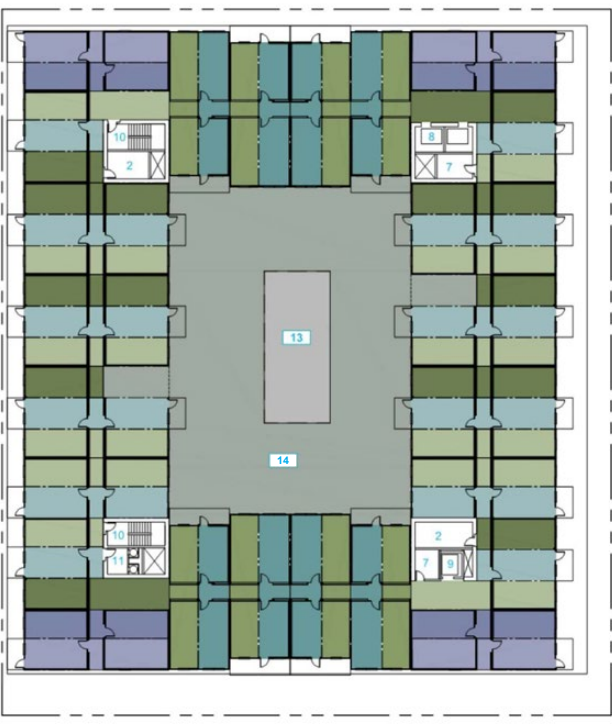


Note: See detailed Milestone Schedules in Appendix

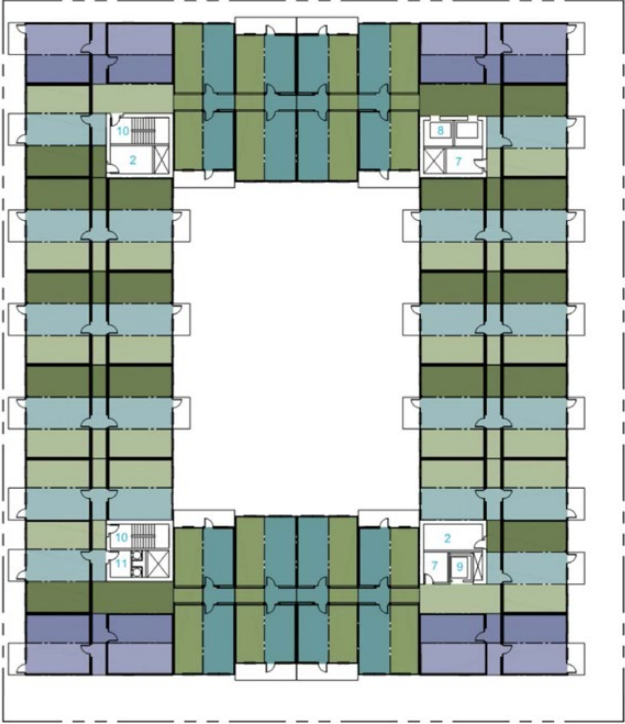
V. BUILDING PLANS & SECTION



Level 1 - Podium



Level 2



Level 3-6



Level 7

Building Plan

- 01 Bike Room

02 Mechanical

03 Entry Lobby

04 Lounge
- 05 Amenity Space

06 Trash Staging

07 Electrical

08 Resident Elevators
- 09 Service Elevators

10 Stair

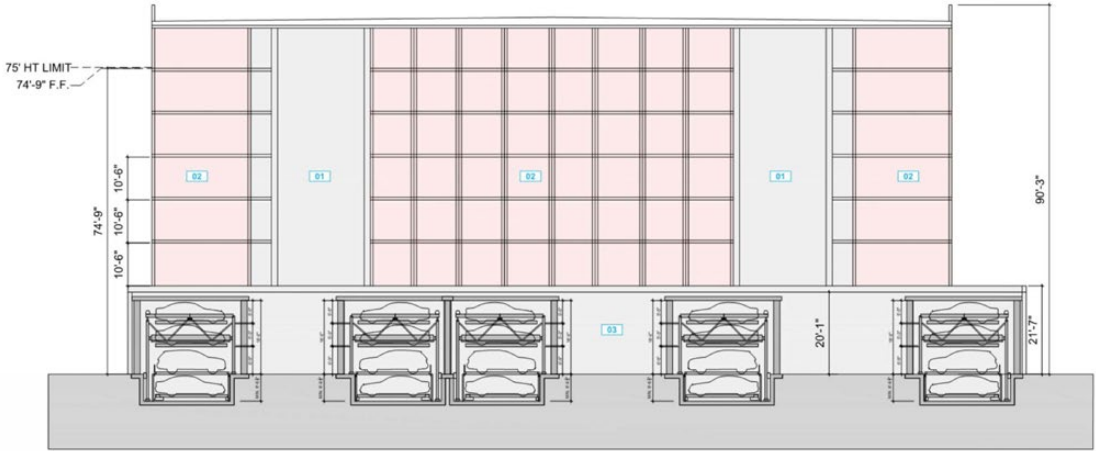
11 Trash Room

12 Pool Above
- 13 Pool

14 Courtyard

15 Roof Deck

UNIT SUMMARY	NRSF	LEVEL 2	LEVEL 3	LEVEL 4	LEVEL 5	LEVEL 6	LEVEL 7	TOTAL UNITS	MIX	TOTAL NRSF
1A - Jr. 1 BD, 1 BATH	482	8	8	8	8	8	4	44	17%	21,208
SUBTOTAL JR. 1 BD								44		
1B - 1 BED, 1 BATH	528	14	12	12	12	12	12	74		39,072
1C - 1 BED, 1 BATH	572	8	8	8	8	8	4	44	46%	25,168
SUBTOTAL 1 BD								118		
2A - 2 BED, 2 BATH	804	14	16	16	16	16	16	94		75,576
SUBTOTAL 2BD								94	37%	
TOTAL		44	44	44	44	44	36	256		161,024
AVERAGE										629



Section

BUILDING SECTION

- 01 RESIDENTIAL UNITS
- 02 CORE
- 03 PODIUM LEVEL

VI. RENDERING

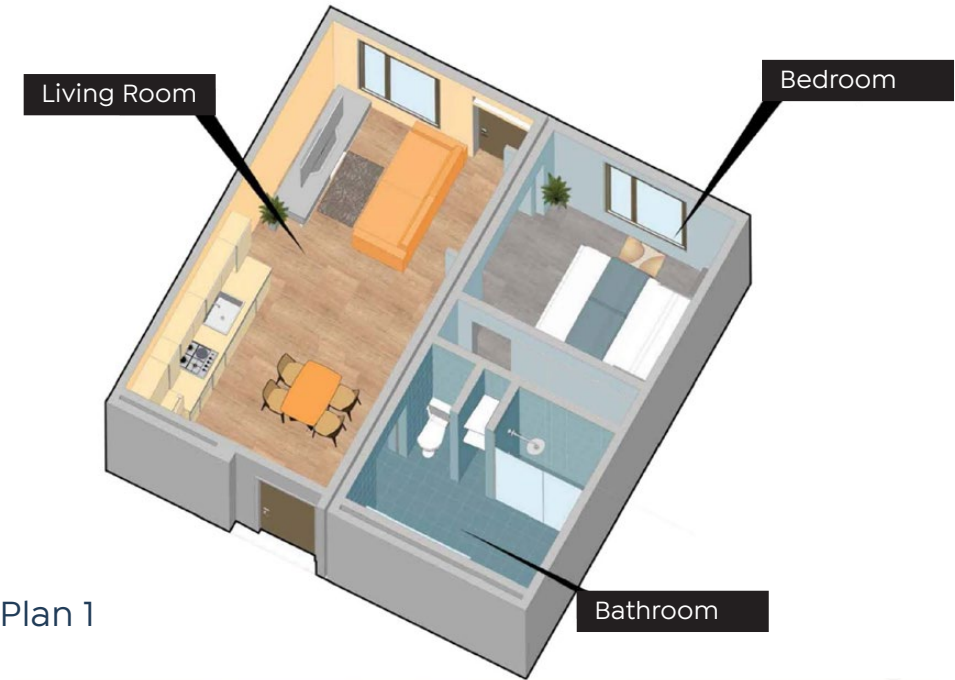


VII. MODULES & UNIT PLANS

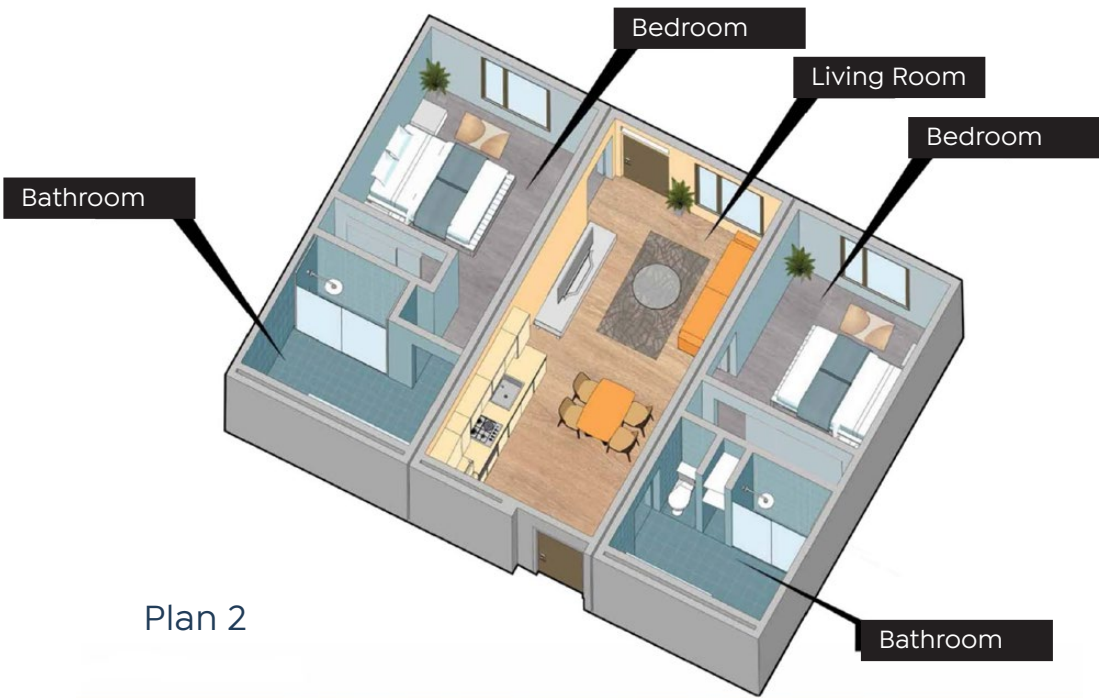
Modules



Unit Plans



Plan 1



Plan 2

VIII. APPENDIX

VII. APPENDIX

CONCEPTUAL HARD COST BUDGET – STEEL VOLUMETRIC MODULAR



ONSITE BUDGET: \$59,229,678

OFFSITE BUDGET: \$33,395,090 ¹

TOTAL HARD COST BUDGET: \$92,624,768

¹ Based on an average cost per modular SF of \$185 to include manufacturing, taxes, offsite staging, transportation to the jobsite and the prefabricated roofing system.

Manufacturing and transportation costs will vary significantly depending upon where the modules are fabricated. The \$185 cost is a blended bottom-line rate based on data from both international and domestic U.S. manufacturers. For international manufacturers, production costs are often lower; however, shipping costs are higher and import fees and tariffs will apply.

VII. APPENDIX



Optimum Modular Prototype - Market Rate
Rough Order of Magnitude Estimate - Modular On-Site Scope
Los Angeles, California

Gross Residential Area = 209,770 sf
Total Number of Units = 256 units
Total Rentable Area = 161,024 sf

Printed: 7/27/21 7:57 AM
Date Prepared: 27-Jul-21
Estimate No.: #217049
Gross Square Feet: 256,408
Months On-Site: 16.0
Includes Addenda: N/A
Estimator: SN, KP

CSI BUDGET SUMMARY
July 27, 2021

#	CSI # 2012	Seq	Description	Notes	Total	Levels 2-7	Level 1	Garage	Indoor Amenity	Outdoor Amenity	Onsite	Cost Rentable Sqft	Cost per Gross Residential Sqft	Cost per Unit	Cost per Overall Gross
	000001	1	Project Data												
	010000	2	General Requirements		173,743	10,104	385	2,032	300	0	160,923	\$1.08	\$0.83	\$478.68	\$0.68
	010530	4	Survey & Layout		294,057	20,207	770	4,064	600	0	268,416	\$1.83	\$1.40	\$1,148.66	\$1.15
	015250	6	Temporary Hoists		370,000	278,820	50,255	35,658	5,268	0	0	\$2.30	\$1.76	\$1,445.31	\$1.44
	015610	11	Progressive Cleanup		127,354	33,835	6,345	33,495	4,948	16,244	32,486	\$0.79	\$0.61	\$497.48	\$0.50
	015620	12	Dumpsters		51,167	10,831	2,031	10,722	1,584	15,600	10,399	\$0.32	\$0.24	\$199.87	\$0.20
	015723	13	SWPPP		41,143	0	0	0	0	0	41,143	\$0.26	\$0.20	\$160.71	\$0.16
	017100	16	Final Cleaning		79,565	51,310	9,623	8,127	10,505	0	0	\$0.49	\$0.38	\$310.80	\$0.31
	032000	47	Concrete Reinforcing		2,299,459	469,621	321,957	1,168,578	339,303	0	0	\$14.28	\$10.96	\$8,982.26	\$8.97
	033000	53	Cast-In-Place Concrete	Includes Precast Stairs	6,283,335	1,654,511	836,426	3,117,514	624,884	50,000	0	\$39.02	\$29.95	\$24,544.28	\$24.51
	033550	56	Sealed Concrete Flooring		40,299	22,887	17,413	0	0	0	0	\$0.25	\$0.19	\$157.42	\$0.16
	034100	60	Precast Structural Concrete		163,600	163,600	0	0	0	0	0	\$1.02	\$0.78	\$639.06	\$0.64
	042233	84	Brick & Interlocking Pavers		555,360	0	0	0	0	555,360	0	\$3.45	\$2.65	\$2,169.38	\$2.17
	051000	93	Structural Steel Framing		11,664	0	11,664	0	0	0	0	\$0.07	\$0.06	\$45.56	\$0.05
	053000	96	Metal Decking		11,470	11,470	0	0	0	0	0	\$0.07	\$0.05	\$44.80	\$0.04
	055000	104	Metal Fabrications		433,258	78,975	38,460	305,318	10,505	0	0	\$2.69	\$2.07	\$1,692.41	\$1.69
	055100	105	Metal Stairs		78,060	29,810	48,250	0	0	0	0	\$0.48	\$0.37	\$304.92	\$0.30
	055816	113	Equipment Screens		165,000	165,000	0	0	0	0	0	\$1.02	\$0.79	\$644.53	\$0.64
	055900	114	Metal Trellis		37,440	0	0	0	0	37,440	0	\$0.23	\$0.18	\$146.25	\$0.15
	057000	116	Decorative Metal		2,586,140	2,290,340	0	0	0	295,800	0	\$16.06	\$12.33	\$10,102.11	\$10.09
	061000	118	Rough Carpentry		52,202	52,202	0	0	0	0	0	\$0.32	\$0.25	\$203.91	\$0.20
	064600	134	Finish Carpentry		94,242	69,682	12,702	1,953	9,905	0	0	\$0.59	\$0.45	\$368.13	\$0.37
	071000	144	Waterproofing		1,204,276	257,700	11,580	356,496	0	578,500	0	\$7.48	\$5.74	\$4,704.20	\$4.70
	071800	147	Traffic/Deck Coatings		147,864	147,864	0	0	0	0	0	\$0.92	\$0.70	\$577.59	\$0.58
	072100	149	Thermal Insulation		445,193	354,277	78,682	12,233	0	0	0	\$2.76	\$2.12	\$1,739.03	\$1.74
	072200	150	Roof & Deck Insulation		8,596	0	5,774	0	2,822	0	0	\$0.05	\$0.04	\$33.58	\$0.03
	072400	151	Exterior Insulation & Finish Systems (EIFS)	SF Allowance	2,318,609	1,811,801	176,392	330,415	0	0	0	\$14.40	\$11.05	\$9,057.06	\$9.04
	074213	161	Metal Wall Panels	SF Allowance	3,081,315	2,747,054	143,464	190,797	0	0	0	\$19.14	\$14.69	\$12,036.39	\$12.02
	075000	165	Membrane Roofing		420,881	420,881	0	0	0	0	0	\$2.61	\$2.01	\$1,644.06	\$1.64
	076000	170	Flashing & Sheet Metal		364,355	291,059	10,384	54,814	8,098	0	0	\$2.26	\$1.74	\$1,423.26	\$1.42
	078400	182	Firestopping & Sealing		111,210	106,049	5,161	0	0	0	0	\$0.69	\$0.53	\$434.41	\$0.43
	079000	185	Joint Sealants & Caulking		67,920	0	9,623	50,794	7,504	0	0	\$0.42	\$0.32	\$265.31	\$0.26
	081100	187	Metal Doors & Frames		96,000	66,300	25,200	0	4,500	0	0	\$0.60	\$0.46	\$375.00	\$0.37
	083300	197	Ceiling Doors & Grilles		5,550	0	5,550	0	0	0	0	\$0.03	\$0.03	\$21.68	\$0.02
	083400	199	Elevator Smoke Containment System		170,100	145,800	24,300	0	0	0	0	\$1.06	\$0.81	\$664.45	\$0.66
	084100	205	Entrances & Storefronts		2,649,330	1,667,250	259,380	0	722,700	0	0	\$16.45	\$12.63	\$10,348.95	\$10.33
	087000	224	Finish Door Hardware		44,563	30,500	12,000	0	2,063	0	0	\$0.28	\$0.21	\$174.07	\$0.17
	092300	238	Gypsum Plastering		1,371,471	945,334	175,856	250,280	0	0	0	\$8.52	\$6.54	\$5,357.31	\$5.35
	092900	245	Gypsum Board		1,464,350	1,079,462	268,083	0	116,806	0	0	\$9.09	\$6.98	\$5,720.12	\$5.71
	093000	247	Tiling		50,127	0	0	0	50,127	0	0	\$0.31	\$0.24	\$195.81	\$0.20
	096500	272	Resilient Flooring & Base		314,373	263,586	331	0	50,455	0	0	\$1.95	\$1.50	\$1,228.02	\$1.23
	099000	295	Painting & Coating		308,285	210,846	26,804	57,047	13,588	0	0	\$1.91	\$1.47	\$1,204.24	\$1.20
	099623	298	Graffiti-Resistant Coatings		12,317	0	12,317	0	0	0	0	\$0.08	\$0.06	\$48.11	\$0.05
	101500	309	Interior Signage		174,357	137,409	5,235	27,632	4,082	0	0	\$1.08	\$0.83	\$681.08	\$0.68
	104400	330	Fire Protection Specialties		19,231	15,155	577	3,048	450	0	0	\$0.12	\$0.09	\$75.12	\$0.08

VII. APPENDIX

* CSI # 2012	Seq	Description	Notes	Total	Levels 2-7	Level 1	Garage	Indoor Amenity	Outdoor Amenity	Onsite	Cost Rentable	Cost per Gross	Cost per Unit	Cost per
											Sqft	Residential Sqft	Overall Gross	Overall Gross
105500	335	Postal Specialties		32,821	32,821	0	0	0	0	0	\$0.20	\$0.16	\$128.21	\$0.13
111200	351	Parking Control Equipment & Mechanical Lifts		6,425,000	0	0	6,425,000	0	0	0	\$39.90	\$30.63	\$25,097.66	\$25.06
112423	365	Window Washing Systems		241,875	241,875	0	0	0	0	0	\$1.50	\$1.15	\$944.82	\$0.94
129300	436	Bike Parking		43,000	0	0	0	43,000	0	0	\$0.27	\$0.20	\$167.97	\$0.17
131100	438	Swimming Pools		378,480	0	0	0	0	378,480	0	\$2.35	\$1.80	\$1,478.44	\$1.48
142100	470	Modular Elevators		1,113,000	954,000	159,000	0	0	0	0	\$6.91	\$5.31	\$4,347.66	\$4.34
142700	472	Custom Elevator Cab & Door Finishes		45,000	15,000	15,000	15,000	0	0	0	\$0.28	\$0.21	\$175.78	\$0.18
149182	488	Trash Chutes		21,000	18,000	3,000	0	0	0	0	\$0.13	\$0.10	\$82.03	\$0.08
210000	490	Fire-Suppression Systems		333,707	176,506	33,101	101,588	22,511	0	0	\$2.07	\$1.59	\$1,303.54	\$1.30
220000	501	Plumbing		1,238,880	912,844	192,450	75,962	48,024	9,600	0	\$7.69	\$5.91	\$4,839.37	\$4.83
230000	515	HVAC		4,444,126	4,041,440	153,960	92,648	156,078	0	0	\$27.60	\$21.19	\$17,359.87	\$17.33
260000	537	Electrical		2,913,790	2,184,980	273,279	284,445	171,086	0	0	\$18.10	\$13.89	\$11,381.99	\$11.36
265600	551	Misc. Site Lighting		11,525	0	0	0	0	0	11,525	\$0.07	\$0.05	\$45.02	\$0.04
273000	555	Voice Communications		1,248,602	1,093,210	41,646	81,270	32,476	0	0	\$7.75	\$5.95	\$4,877.35	\$4.87
281353	563	Security Access Detection		407,266	353,626	13,472	29,664	10,505	0	0	\$2.53	\$1.94	\$1,590.88	\$1.59
283000	565	Facility - Detection & Alarm		657,437	586,009	22,324	31,695	17,409	0	0	\$4.08	\$3.13	\$2,568.11	\$2.56
311000	568	Site Clearing/Earthwork		220,373	0	0	0	0	0	220,373	\$1.37	\$1.05	\$860.83	\$0.86
312500	578	Erosion Control		58,800	0	0	0	0	0	58,800	\$0.37	\$0.28	\$229.69	\$0.23
321313	610	Site Concrete Sidewalks & Paving		299,284	0	0	0	0	177,095	122,190	\$1.86	\$1.43	\$1,169.08	\$1.17
321700	618	Paving Specialties, Striping, Bumpers & Signs		8,278	0	0	4,278	0	0	4,000	\$0.05	\$0.04	\$32.34	\$0.03
329000	632	Landscape & Irrigation		174,779	0	0	0	0	164,279	10,500	\$1.09	\$0.83	\$682.73	\$0.68
331116	641	Site Domestic Water		34,493	0	0	0	0	0	34,493	\$0.21	\$0.16	\$134.74	\$0.13
331119	642	Site Fire Protection Water Distribution		27,143	0	0	0	0	0	27,143	\$0.17	\$0.13	\$106.03	\$0.11
331233	644	Water Metering, Vaults & Pads		22,000	0	0	0	0	0	22,000	\$0.14	\$0.10	\$85.94	\$0.09
333000	651	Site Sanitary Sewerage Utilities		73,650	0	0	0	0	0	73,650	\$0.46	\$0.35	\$287.70	\$0.29
334000	654	Site Storm Drainage System		132,025	0	0	0	0	0	132,025	\$0.82	\$0.63	\$515.72	\$0.51
335100	661	Site Natural-Gas Distribution		2,673	0	0	0	0	0	2,673	\$0.02	\$0.01	\$10.44	\$0.01
337000	665	Site Electrical Utilities		128,204	0	0	0	0	0	128,204	\$0.80	\$0.61	\$500.80	\$0.50
412200	690	Cranes		722,500	510,000	85,000	85,000	0	42,500	0	\$4.49	\$3.44	\$2,822.27	\$2.82
481600	705	ABI701 Compliance Oversight		81,555	46,414	5,948	21,847	4,040	3,235	71	\$0.51	\$0.39	\$318.57	\$0.32
999999	706	Matte Lines/Rigging & Setting Allowance		1,150,000	1,150,000	0	0	0	0	0	\$7.14	\$5.48	\$4,492.19	\$4.49
****End Of Summary - Do Not Edit****														
SUBTOTAL				51,490,090	28,428,255	3,611,153	13,269,411	2,496,126	2,324,134	1,361,012	\$319.77	\$245.46	\$201,133.16	\$200.81
010001	709	Contingency	5.00%	2,574,504	1,421,413	180,558	663,471	124,806	116,207	68,051	\$15.99	\$12.27	\$10,056.66	\$10.04
006150	711	SDI, General Conditions, Liability Insurance & Fee	10.03%	5,165,083	2,851,700	362,243	1,331,084	250,392	233,139	136,526	\$32.08	\$24.62	\$20,176.11	\$20.14
Total Estimate				59,229,678	32,701,368	4,153,954	15,263,965	2,871,324	2,673,479	1,565,589	\$367.83	\$282.36	\$231,365.93	\$231.00

VII. APPENDIX

CONCEPTUAL HARD COST BUDGET – CONVENTIONAL TYPE III OVER PODIUM



TOTAL HARD COST BUDGET: \$106,086,283

VII. APPENDIX

C.W. Driver Conventional Construction Prototype - Market Rate
BUILDERS SINCE 1919 **Rough Order of Magnitude Estimate - Type III**
Los Angeles, California

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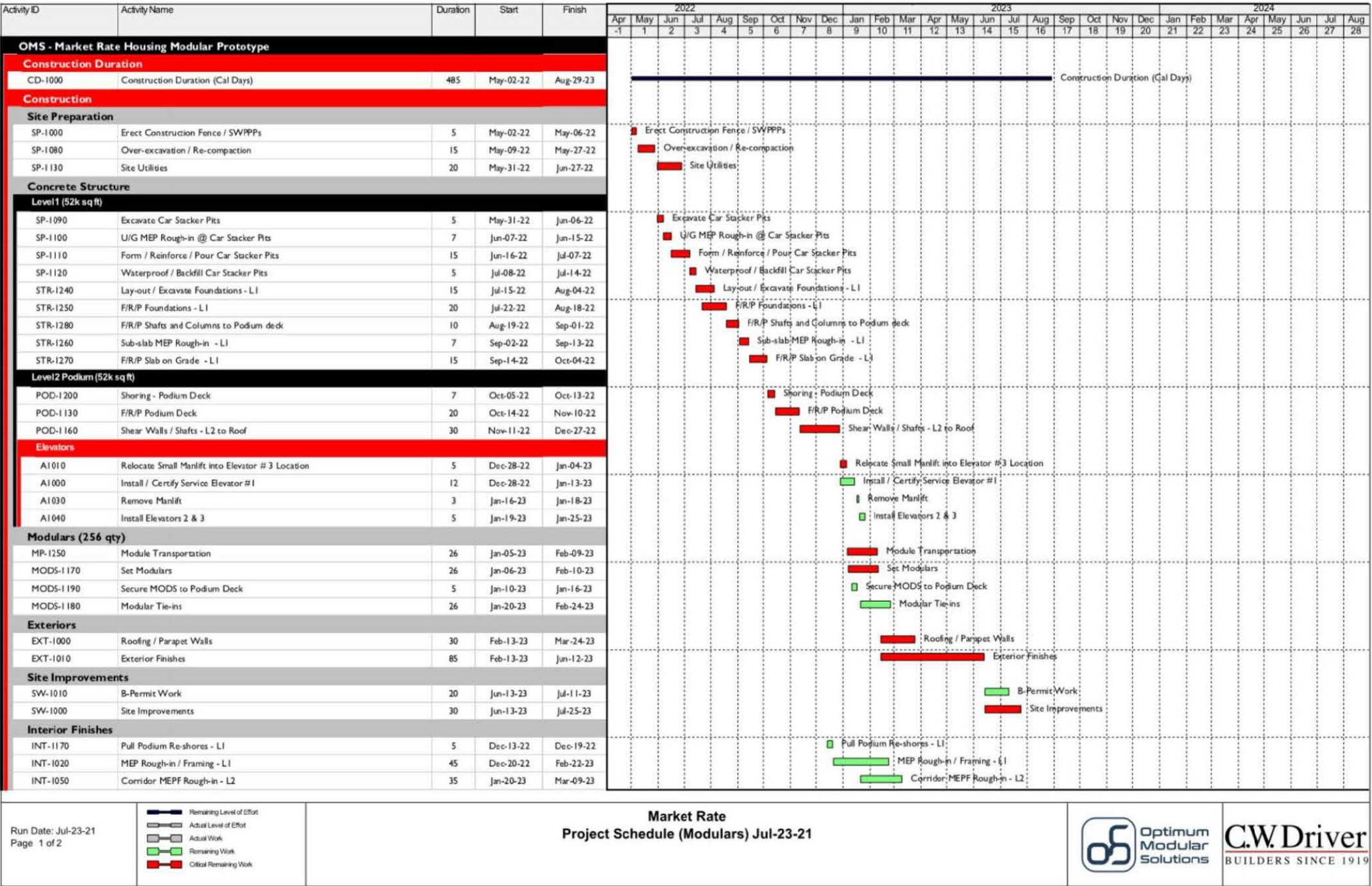
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015250	6	Temporary Hoists		445,000	337,926	52,507	47,543	7,024	0	0	\$2.76	\$2.12	\$1,738.28	\$1.74
015610	11	Progressive Cleanup		164,808	49,813	9,342	49,311	7,285	16,353	32,704	\$1.02	\$0.79	\$643.78	\$0.64
015620	12	Dumpsters		62,806	15,839	2,970	15,680	2,316	15,600	10,399	\$0.39	\$0.30	\$245.33	\$0.24
015723	13	SWPPP		48,362	0	0	0	0	0	48,362	\$0.30	\$0.23	\$188.92	\$0.19
017100	16	Final Cleaning		234,148	205,893	9,623	8,127	10,505	0	0	\$1.45	\$1.12	\$914.64	\$0.91
032000	47	Concrete Reinforcing		2,042,649	302,152	315,414	1,134,038	291,046	0	0	\$12.69	\$9.74	\$7,979.10	\$7.97
033000	53	Cast-In-Place Concrete	Includes Precast Stairs	5,729,414	1,113,096	869,826	3,117,514	578,978	50,000	0	\$35.58	\$27.31	\$22,380.52	\$22.34
033550	56	Sealed Concrete Flooring		85,151	67,738	17,413	0	0	0	0	\$0.53	\$0.41	\$332.62	\$0.33
034100	60	Precast Structural Concrete		163,600	163,600	0	0	0	0	0	\$1.02	\$0.78	\$639.06	\$0.64
035413	68	Gypsum Cement Underlayment		483,072	483,072	0	0	0	0	0	\$3.00	\$2.30	\$1,887.00	\$1.88
042233	84	Brick & Interlocking Pavers		555,360	0	0	0	0	555,360	0	\$3.45	\$2.65	\$2,169.38	\$2.17
051000	93	Structural Steel Framing		369,210	353,626	11,664	0	3,920	0	0	\$2.29	\$1.76	\$1,442.23	\$1.44
055000	104	Metal Fabrications		618,466	266,422	38,460	305,318	8,265	0	0	\$3.84	\$2.95	\$2,415.88	\$2.41
055100	105	Metal Stairs		361,875	313,625	48,250	0	0	0	0	\$2.25	\$1.73	\$1,413.57	\$1.41
055816	113	Equipment Screens		165,000	165,000	0	0	0	0	0	\$1.02	\$0.79	\$644.53	\$0.64
055900	114	Metal Trellis		37,440	0	0	0	0	37,440	0	\$0.23	\$0.18	\$146.25	\$0.15
057000	116	Decorative Metal		2,586,140	2,290,340	0	0	0	295,800	0	\$16.06	\$12.33	\$10,102.11	\$10.09
061000	118	Rough Carpentry		8,093,005	8,014,314	0	0	78,691	0	0	\$50.26	\$38.58	\$31,613.30	\$31.56
061733	121	Wood Joists		5,168,437	5,119,157	0	0	49,280	0	0	\$32.10	\$24.64	\$20,189.21	\$20.16
064100	130	Architectural Wood Casework		99,750	99,750	0	0	0	0	0	\$0.62	\$0.48	\$389.65	\$0.39
064600	134	Finish Carpentry		825,712	801,152	12,702	1,953	9,905	0	0	\$5.13	\$3.94	\$3,225.44	\$3.22
071000	144	Waterproofing		1,398,993	452,417	11,580	356,496	0	578,500	0	\$8.69	\$6.67	\$5,464.82	\$5.46
071800	147	Traffic/Deck Coatings		147,864	147,864	0	0	0	0	0	\$0.92	\$0.70	\$577.59	\$0.58
072100	149	Thermal Insulation		267,510	176,594	78,682	12,233	0	0	0	\$1.66	\$1.28	\$1,044.96	\$1.04
072200	150	Roof & Deck Insulation		33,855	25,259	5,774	0	2,822	0	0	\$0.21	\$0.16	\$132.25	\$0.13
072400	151	Exterior Insulation & Finish Systems (EIFS)	SF Allowance	2,318,609	1,811,801	176,392	330,415	0	0	0	\$14.40	\$11.05	\$9,057.06	\$9.04
074213	161	Metal Wall Panels	SF Allowance	3,081,315	2,747,054	143,464	190,797	0	0	0	\$19.14	\$14.69	\$12,036.39	\$12.02
075000	165	Membrane Roofing		741,234	741,234	0	0	0	0	0	\$4.60	\$3.53	\$2,895.44	\$2.89
076000	170	Flashing & Sheet Metal		364,355	291,059	10,384	54,814	8,098	0	0	\$2.26	\$1.74	\$1,423.26	\$1.42
078400	182	Firestopping & Safing		111,210	106,049	5,161	0	0	0	0	\$0.69	\$0.53	\$434.41	\$0.43
079000	185	Joint Sealants & Caulking		89,743	70,725	2,694	14,222	2,101	0	0	\$0.56	\$0.43	\$350.56	\$0.35
081100	187	Metal Doors & Frames		281,600	251,900	25,200	0	4,500	0	0	\$1.75	\$1.34	\$1,100.00	\$1.10
081400	190	Wood Doors		976,000	976,000	0	0	0	0	0	\$6.06	\$4.65	\$3,812.50	\$3.81
083300	197	Coiling Doors & Grilles		5,550	0	5,550	0	0	0	0	\$0.03	\$0.03	\$21.68	\$0.02
083400	199	Elevator Smoke Containment System		170,100	145,800	24,300	0	0	0	0	\$1.06	\$0.81	\$664.45	\$0.66
084100	205	Entrances & Storefronts		2,649,330	1,667,250	259,380	0	722,700	0	0	\$16.45	\$12.63	\$10,348.95	\$10.33
085200	215	Vinyl Windows		1,983,430	1,983,430	0	0	0	0	0	\$12.32	\$9.46	\$7,747.77	\$7.74
087000	224	Finish Door Hardware		329,963	315,900	12,000	0	2,063	0	0	\$2.05	\$1.57	\$1,288.92	\$1.29
092300	238	Gypsum Plastering		1,171,154	745,017	175,856	250,280	0	0	0	\$7.27	\$5.58	\$4,574.82	\$4.57
092900	245	Gypsum Board		2,254,987	1,864,499	268,083	0	122,406	0	0	\$14.00	\$10.75	\$8,808.54	\$8.79
093000	247	Tiling		3,976,164	3,926,038	0	0	50,127	0	0	\$24.69	\$18.95	\$15,531.89	\$15.51
096500	272	Resilient Flooring & Base		1,569,759	1,518,972	331	0	50,455	0	0	\$9.75	\$7.48	\$6,131.87	\$6.12

VII. APPENDIX

#	CSI # 2012	Seq	Description	Notes	Total	Levels 2-7	Level 1	Garage	Indoor Amenity	Outdoor Amenity	Onsite	Cost Rentable	Cost per Gross	Cost per Unit	Cost per
												Sqft	Residential Sqft		Overall Gross
	099000	295	Painting & Coating		1,437,450	1,340,011	26,804	57,047	13,588	0	0	\$8.93	\$6.85	\$5,615.04	\$5.61
	099623	298	Graffiti-Resistant Coatings		12,317	0	12,317	0	0	0	0	\$0.08	\$0.06	\$48.11	\$0.05
	101500	309	Interior Signage		174,357	137,409	5,235	27,632	4,082	0	0	\$1.08	\$0.83	\$681.08	\$0.68
	102813	322	Toilet Accessories		38,588	38,588	0	0	0	0	0	\$0.24	\$0.18	\$150.73	\$0.15
	102818	323	Metal Framed Mirrors		43,750	43,750	0	0	0	0	0	\$0.27	\$0.21	\$170.90	\$0.17
	102819	324	Tub & Shower Doors		567,350	567,350	0	0	0	0	0	\$3.52	\$2.70	\$2,216.21	\$2.21
	104400	330	Fire Protection Specialties		19,231	15,155	577	3,048	450	0	0	\$0.12	\$0.09	\$75.12	\$0.08
	105500	335	Postal Specialties		32,821	32,821	0	0	0	0	0	\$0.20	\$0.16	\$128.21	\$0.13
	105700	337	Wardrobe & Closet Specialties		40,425	40,425	0	0	0	0	0	\$0.25	\$0.19	\$157.91	\$0.16
	111200	351	Parking Control Equipment & Mechanical Lifts		6,425,000	0	0	6,425,000	0	0	0	\$39.90	\$30.63	\$25,097.66	\$25.06
	112423	365	Window Washing Systems		241,875	241,875	0	0	0	0	0	\$1.50	\$1.15	\$944.82	\$0.94
	113100	371	Residential Appliances & Equipment		1,331,200	1,331,200	0	0	0	0	0	\$8.27	\$6.35	\$5,200.00	\$5.19
	122200	408	Curtains & Drapes		89,313	89,313	0	0	0	0	0	\$0.55	\$0.43	\$348.88	\$0.35
	123530	415	Residential Kitchen/Bath/Dorm Casework		1,401,600	1,401,600	0	0	0	0	0	\$8.70	\$6.68	\$5,475.00	\$5.47
	129300	436	Bike Parking		43,000	0	0	0	43,000	0	0	\$0.27	\$0.20	\$167.97	\$0.17
	131100	438	Swimming Pools		378,480	0	0	0	0	378,480	0	\$2.35	\$1.80	\$1,478.44	\$1.48
	142100	470	Modular Elevators		945,000	810,000	135,000	0	0	0	0	\$5.87	\$4.50	\$3,691.41	\$3.69
	142700	472	Custom Elevator Cab & Door Finishes		45,000	15,000	15,000	15,000	0	0	0	\$0.28	\$0.21	\$175.78	\$0.18
	149182	488	Trash Chutes		21,000	18,000	3,000	0	0	0	0	\$0.13	\$0.10	\$82.03	\$0.08
	210000	490	Fire-Suppression Systems		1,026,110	868,910	33,101	101,588	22,511	0	0	\$6.37	\$4.89	\$4,008.24	\$4.00
	220000	501	Plumbing		5,944,380	5,618,344	192,450	75,962	48,024	9,600	0	\$36.92	\$28.34	\$23,220.23	\$23.18
	230000	515	HVAC		7,859,590	7,426,112	184,752	92,648	156,078	0	0	\$48.81	\$37.47	\$30,701.52	\$30.65
	260000	537	Electrical		7,740,950	7,118,332	180,903	270,629	171,086	0	0	\$48.07	\$36.90	\$30,238.08	\$30.19
	265600	551	Mac. Site Lighting		11,525	0	0	0	0	0	11,525	\$0.07	\$0.05	\$45.02	\$0.04
	273000	555	Voice Communications		1,248,602	1,093,210	41,646	81,270	32,476	0	0	\$7.75	\$5.95	\$4,877.35	\$4.87
	281353	563	Security Access Detection		407,266	353,626	13,472	29,664	10,505	0	0	\$2.53	\$1.94	\$1,590.88	\$1.59
	283000	565	Facility - Detection & Alarm		603,494	535,491	20,400	31,695	15,908	0	0	\$3.75	\$2.88	\$2,357.40	\$2.35
	311000	568	Site Clearing/Earthwork		227,894	0	0	0	0	0	227,894	\$1.42	\$1.09	\$890.21	\$0.89
	312500	578	Erosion Control		58,800	0	0	0	0	0	58,800	\$0.37	\$0.28	\$229.69	\$0.23
	321313	610	Site Concrete Sidewalks & Paving		299,284	0	0	0	0	177,095	122,190	\$1.86	\$1.43	\$1,169.08	\$1.17
	321700	618	Paving Specialties, Striping, Bumpers & Signs		8,278	0	0	4,278	0	0	4,000	\$0.05	\$0.04	\$32.34	\$0.03
	329000	632	Landscape & Irrigation		174,779	0	0	0	0	164,279	10,500	\$1.09	\$0.83	\$682.73	\$0.68
	331116	641	Site Domestic Water		34,493	0	0	0	0	0	34,493	\$0.21	\$0.16	\$134.74	\$0.13
	331119	642	Site Fire Protection Water Distribution		27,143	0	0	0	0	0	27,143	\$0.17	\$0.13	\$106.03	\$0.11
	331233	644	Water Metering, Vaults & Pads		22,000	0	0	0	0	0	22,000	\$0.14	\$0.10	\$85.94	\$0.09
	333000	651	Site Sanitary Sewerage Utilities		73,650	0	0	0	0	0	73,650	\$0.46	\$0.35	\$287.70	\$0.29
	334000	654	Site Storm Drainage System		132,025	0	0	0	0	0	132,025	\$0.82	\$0.63	\$515.72	\$0.51
	335100	661	Site Natural-Gas Distribution		2,673	0	0	0	0	0	2,673	\$0.02	\$0.01	\$10.44	\$0.01
	337000	665	Site Electrical Utilities		128,204	0	0	0	0	0	128,204	\$0.80	\$0.61	\$500.80	\$0.50
	412200	690	Cranes		722,500	510,000	85,000	85,000	0	42,500	0	\$4.49	\$3.44	\$2,822.27	\$2.82
	481600	705	AB1701 Compliance Oversight		145,678	112,291	5,574	20,747	3,913	3,085	68	\$0.90	\$0.69	\$569.06	\$0.57
			****End Of Survey - Do Not Edit****												

VII. APPENDIX

CONCEPTUAL CONSTRUCTION SCHEDULE - MODULAR



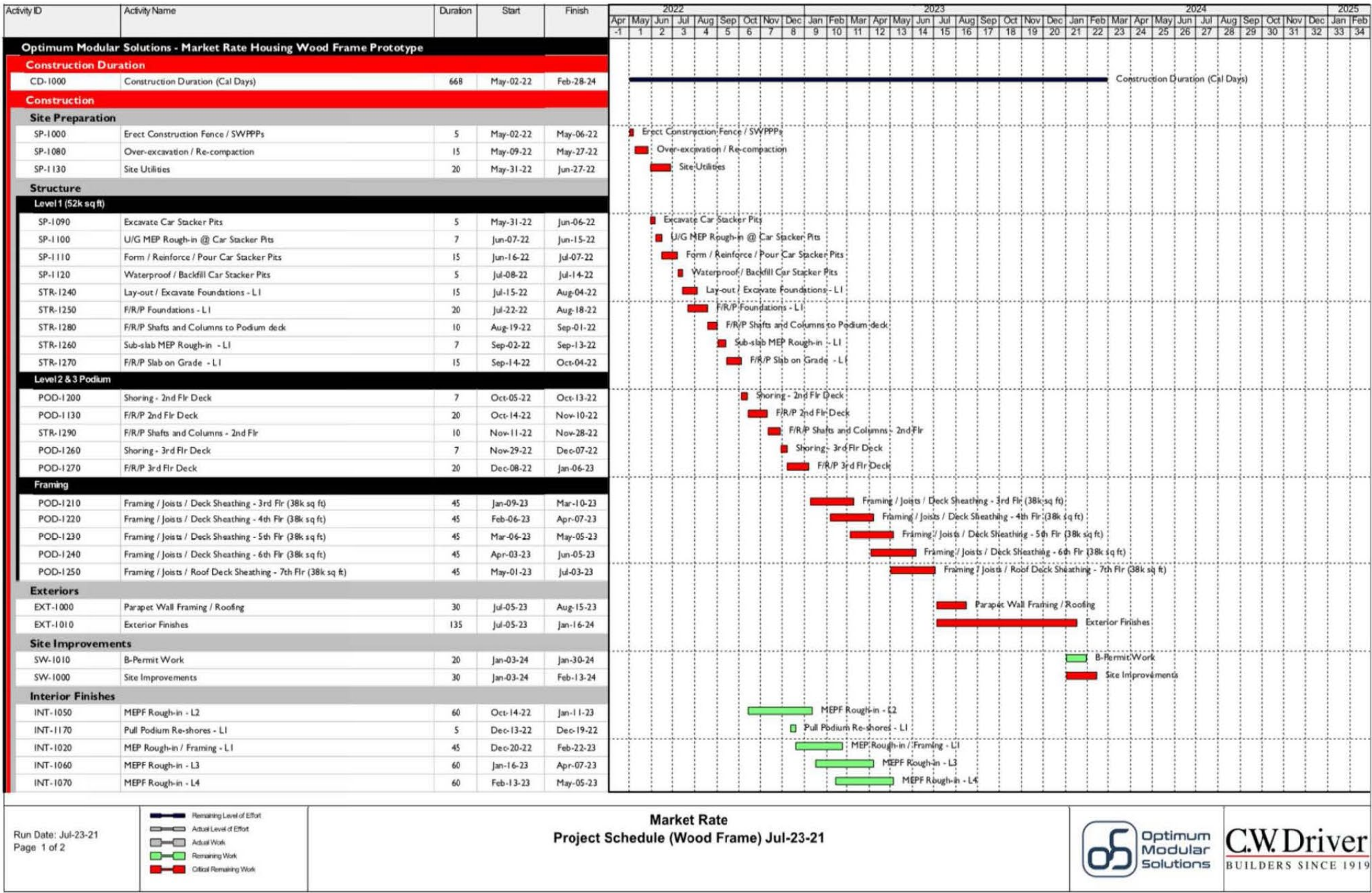
VII. APPENDIX

CONCEPTUAL CONSTRUCTION SCHEDULE - MODULAR



VII. APPENDIX

CONCEPTUAL CONSTRUCTION SCHEDULE - CONVENTIONAL



VII. APPENDIX

CONCEPTUAL CONSTRUCTION SCHEDULE - CONVENTIONAL

