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Report Title

City of Oakland parking garage Electric Vehicle Charging Stations (EVCS) Feasibility Assessment

March 11, 2021

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1.0 INTRODUCTION

Stantec Consulting Services, Inc. was contracted by East Bay Community Energy to investigate the feasibility of installing EVCS at the Oakland Parking Garage located at 1250 Martin Luther King Way, Oakland CA. A site walk was performed on March 04, 2021 with Stantec, EBCE and building management staff to investigate the existing site conditions and to evaluate if the existing electrical distribution system can be modified to feasibly accommodate EVCS. This report provides a feasibility analysis for the installation of Electric Vehicle DC Fast Charging Stations.

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2.0 DESIGN CONCIDERATIONS

This project would install the necessary infrastructure required to support up to 25 new charging stations. The following considerations were made:

- A new PG&E metering service would be required at a 2MW maximum size.
- Workplace charging which would trigger the need for Accessible charging.
- Costs related to a new electrical service.
- Electrical distribution equipment and materials
- Installation of electrical system, including conduit/ conductor, trenching, coring, etc.
- Procurement and installation of the DCFC
- Required ADA parking upgrades.

3.0 CONCEPTUAL DESIGN

Based on Stantec's preliminary findings and subsequent discussion with EBCE and facility staff, the proposed installation includes provisions for (2) ADA 75kW DCFC charging spaces, (13) standard 75kW DCFC and (2) 175kW DCFC serving a total of 34 spaces.

3.1 UTILITY POWER

Preliminary load calculations have been developed and provision for a new 2MW utility service. An area in the South West corner of level 1 of the parking garage was identified as a possible location to place the new PG&E transformer.

3.2 ELECTRICAL DISTRIBUTION – EVCS SYSTEM

It was determined that a 3000A switchboard with meter assembly would be required. Two proposed options were evaluated for the location of the new switchboard and charging spaces.

Option A – Charging spaces on Parking Level 1-4

For this design option, the 3000A switchboard would be located in the South West corner of parking level 1. The switchboard would feed (2) 75kW DCFCs near the existing ADA parking on level 1 and (2) 175kW DCFCs on the south side of the garage on level 1. The switchboard would feed (3) 600A sub-panels on levels 2, 3 and 4 respectively, powering (13) DCFCs located in adjacent parking spaces. The DCFCs will have the capability of each powering 2 charging spaces.

Option B – Charging spaces on Parking Level 1 and 7 chargers

The intent of this design option is to consolidate (13) 75kW DCFCs on the parking level 7, along with the new switchboard. This will provide a central charging location in the parking garage that is believed to be underutilized. For this design option, the switchboard will feed the (2) 75kW DCFC and the (2) 175kW DCFC located on parking level 1. This option may require additional structural engineering during the construction documentation phase, which has not been accounted for in this assessment.

3.3 ACCESSIBLE CHARGING

The ADA charging spaces will be located on parking level 1 adjacent to the existing ADA parking. The existing ADA path of travel and striping will be utilized. Per CBC 11B-228.3.2.1 and Table 11B-228.3.2.1 there will be a requirement of 1 van, 1 standard, and 1 ambulatory electric vehicle charge stations. Two alternative locations were considered for the ADA charging spaces. The two alternatives are listed below.

Alternative 1

This is the preferred option of the facility, which keeps the temporary parking stalls in the general location as they exist now. As indicated in the attached ADA CHARGING SPACES - ALTERNATE 1 sketch, there are non-compliant slopes in the parking spaces (greater than 2%). We understand regrading/resurfacing is not a feasible option, but an exemption from the Cities permitting office or appropriate Authority Having Jurisdiction (AHJ) may be possible due to existing retrofit constraints. Stantec did not explore this with the AHJ and did not consider any potential regrading/re-surfacing costs related to this option.

Alternative 2

This option would require relocating the temporary 2-minute parking spaces, shifting the accessible stalls closer to the compliant grade area as indicated in the attached ADA CHARGING SPACES, ALTERNATE 2 sketch. It must be noted that the grade measurements are approximate and based on hand measurements (not surveyed) taken but appear to be within the 2% max slope requirements in all directions.

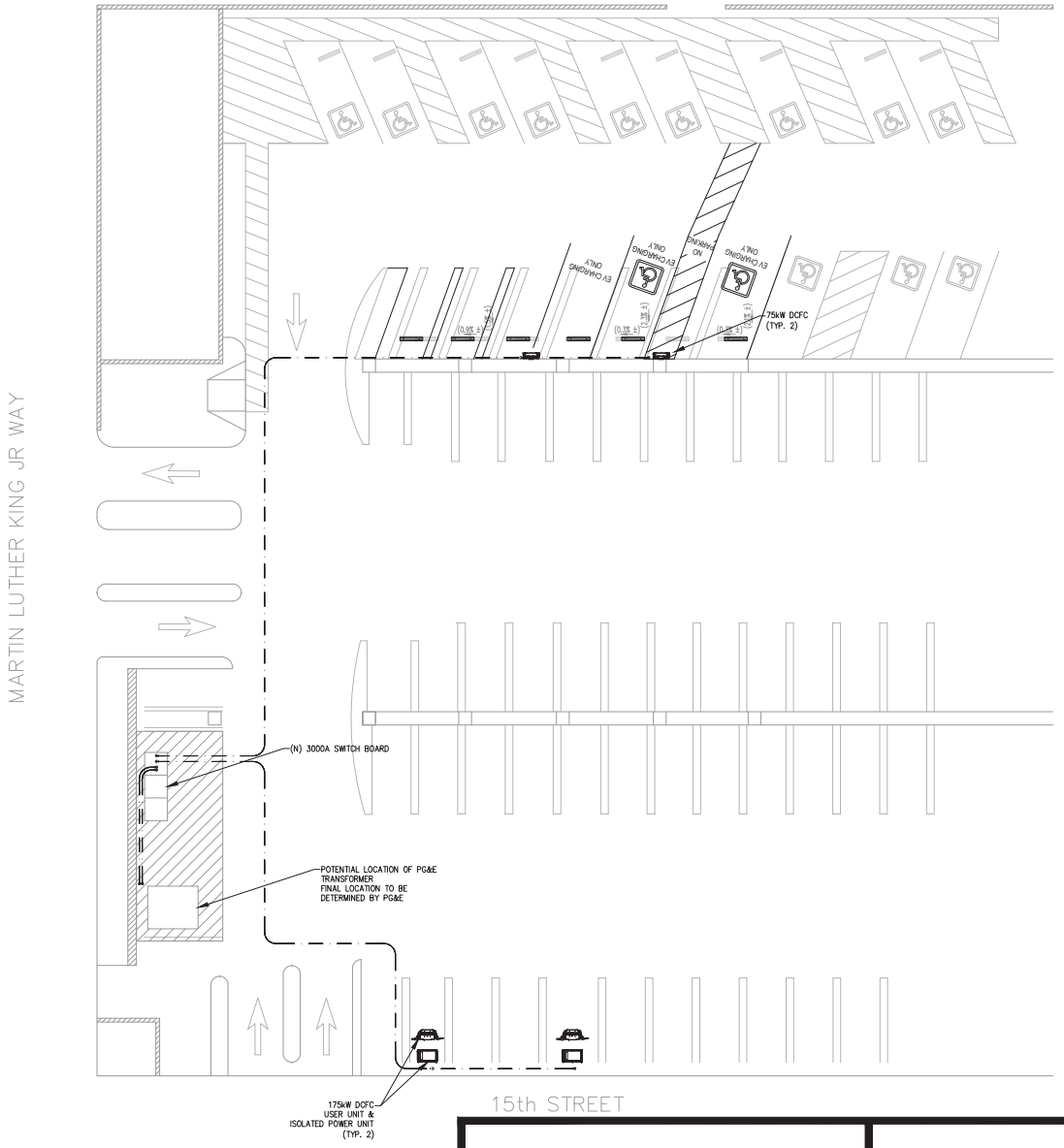
4.0 OPINION OF PROBABLE COST SUMMARY

In providing opinions of probable construction cost, it is recognized that neither the Client nor Stantec has control over the costs of labor, equipment, or materials, or over the Contractor's methods of determining prices or bidding. Opinions of probable construction cost prepared by Stantec are based on Stantec's reasonable professional judgment and experience and do not constitute a warranty, express or implied, that the Contractor's bids or the negotiated price of the work will not vary from the Client's budget or from any opinion of probable cost prepared by Stantec.

Option A – Charging spaces on Parking Level 1-4	Cost
(3) 75kW ADA Chargers; (2) 175 Chargers; (13) standard DCFC. • Parking Level 1 – New PG&E service – 3000A Switchboard – (2) 75kW DCFC – (2) 175kW DCFC • Parking Level 2 – 600A Sub Panel – (5) 75kW DCFC • Parking Level 3 – 600A Sub Panel – (5) 75kW DCFC • Parking Level 4 – 600A Sub Panel – (5) 75kW DCFC	$1,456,257
Option B - Charging spaces on Parking Level 1 and 7	
(3) 75kW ADA Chargers; (2) 175 Chargers; (13) standard DCFC. • Parking Level 1 – New PG&E service – (2) 75kW DCFC – (2) 175kW DCFC • Parking Level 7 – 3000A Switchboard – (13) 75kW DCFC	$1,581,550

OPTION A

Charging spaces on Parking Level 1-4



GRAPHIC SCALE

10 0 10 30

1" = 10'

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CITY CENTER GARAGE WEST

PARKING LEVEL 1

OPTION A - ELECTRICAL PLAN

3/10/2021

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CITY CENTER GARAGE WEST
PARKING LEVEL 2-4
OPTION A - ELECTRICAL PLAN

3/10/2021

PHASE 1 PRELIMINARY ASSESSMENTS FOR EVSE
PRELIMINARY COST ESTIMATE
Mar-21

INDIVIDUAL SITE RECAP SHEET

Site No :	**1**
Facility/Institution	**Oakland City Center Garage - Option A**
Region	**Oakland**
Site Address	**1250 Martin Luther King Jr Way**

Return to Recap of Sites
Return to Site Matrix

SITE DETAILS	
New/Upgrade service	Yes
# of receptacles	34
New Panel Required	Yes
New Transformer Required	Yes
New Core Required	Yes
New Trenching Required	Yes

ESTIMATE RECAP

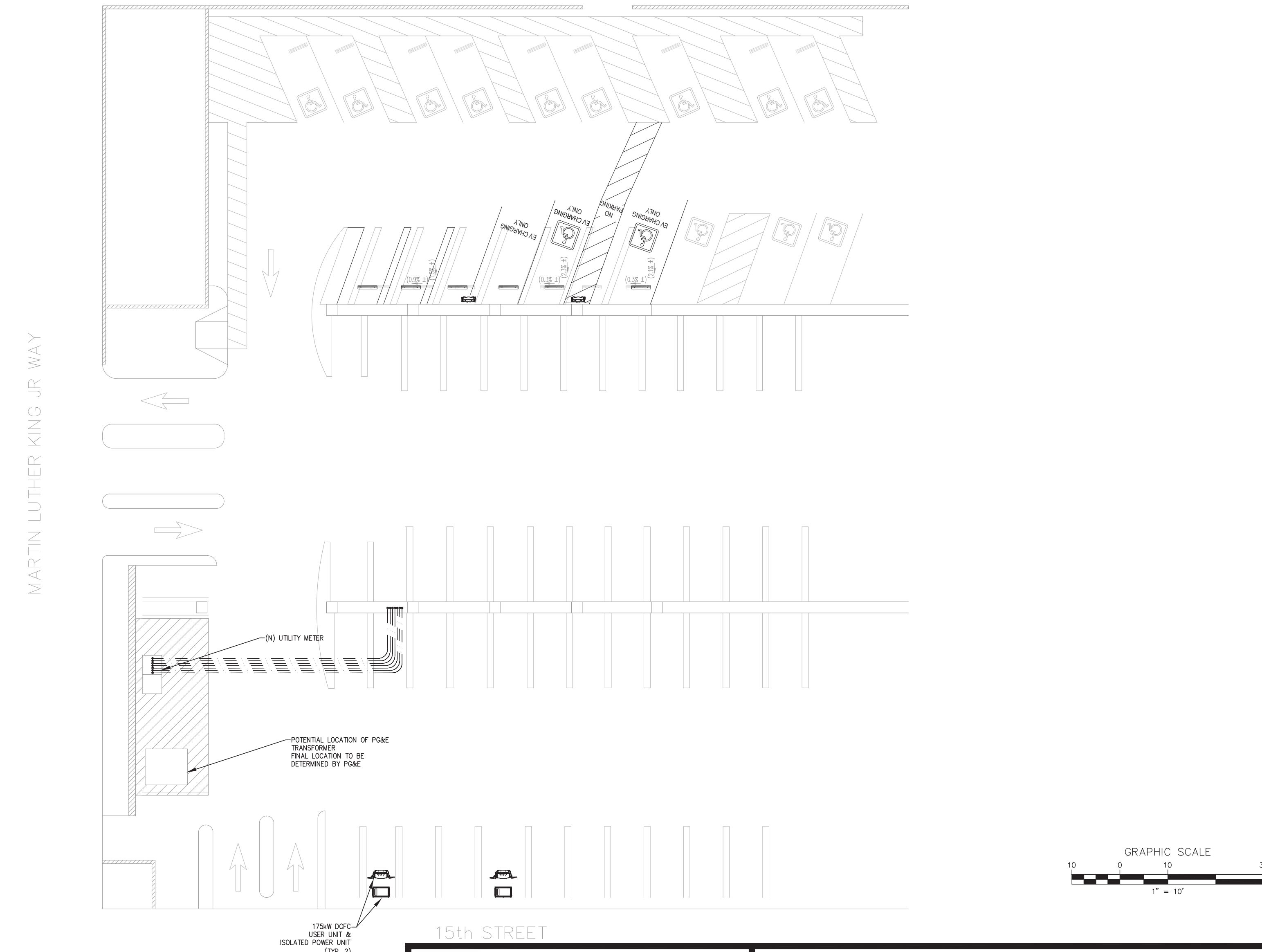
DIV	TRADE ITEM	AMOUNT	
150	SITE SPECIFIC WORK	3,000	
310	GENERAL	21,758	
320	ELECTRICAL	1,095,440	
	SUBTOTAL TRADE COSTS		1,120,198
	Contractor Mark Up (10%)		112,020
	Contigency (20%)		224,040
	TOTAL ESTIMATE AMOUNT - THIS SITE		**$ 1,456,257**

ESTIMATE SUMMARY

150	SITE SPECIFIC WORK	QTY	UM	UNIT	EXT	$	3,000
	Civil Re-striping	1	EA	3,000	3,000		
					-		
310	GENERAL	QTY	UM	UNIT	EXT	$	21,758
	Core	13	EA	650.00	$8,450.00		
	Trenching	50	LF	116.16	$5,808.00		
	General Terms Fee	1	LS	7,500	7,500		
320	ELECTRICAL	QTY	UM	UNIT	EXT	$	1,095,440
	New/Upgraded Service Fee	1	LS	$200,000	$200,000		
	Branch circuits to DCFC	2,190	LF	$32	$68,985		
	Feeder to Electrical Distribution boards	400	LF	$48	$19,000		
	New 600A panel board	3	EA	$13,185	$39,555		
	New 3000A Switch board with meter - Outdoor (including main and feeder breakers)	1	EA	$60,000	$60,000		
	75kW Tritium DC Fast Charger	15	EA	$35,000	$525,000		
	175kW Tritium DC Fast Charger	2	EA	$90,000	$180,000		
	Misc Electrical components (incl. grounding)	2	EA	$500	$1,000		
	Concrete Slab with Mechanical Protection Bollards	2	EA	$950	$1,900		

OPTION B

Charging spaces on Parking Level 1 and 7



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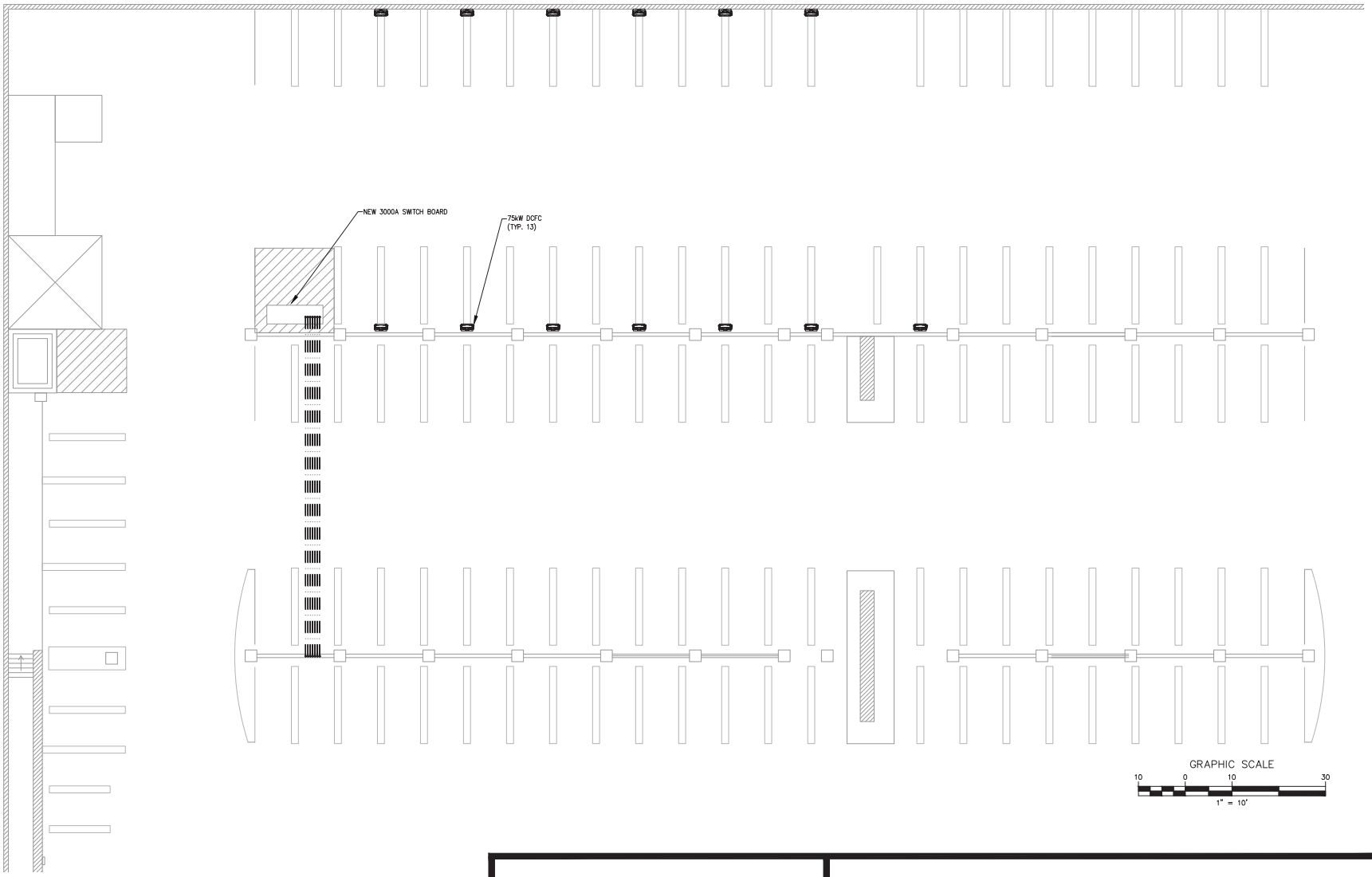
CITY CENTER GARAGE WEST
PARKING LEVEL 1
OPTION B - ELECTRICAL PLAN

3/10/2021



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CITY CENTER GARAGE WEST

PARKING LEVEL 7

OPTION B - ELECTRICAL PLAN

3/10/2021

PHASE 1 PRELIMINARY ASSESSMENTS FOR EVSE
PRELIMINARY COST ESTIMATE
Mar-21

INDIVIDUAL SITE RECAP SHEET

Site No :	**2**
Facility/Institution	**Oakland City Center Garage - Option B**
Region	**Oakland**
Site Address	**1250 Martin Luther King Jr Way**

Return to Recap of Sites
Return to Site Matrix

SITE DETAILS	
New/Upgrade service	Yes
# of receptacles	34
New Panel Required	Yes
New Transformer Required	Yes
New Core Required	Yes
New Trenching Required	Yes

ESTIMATE RECAP

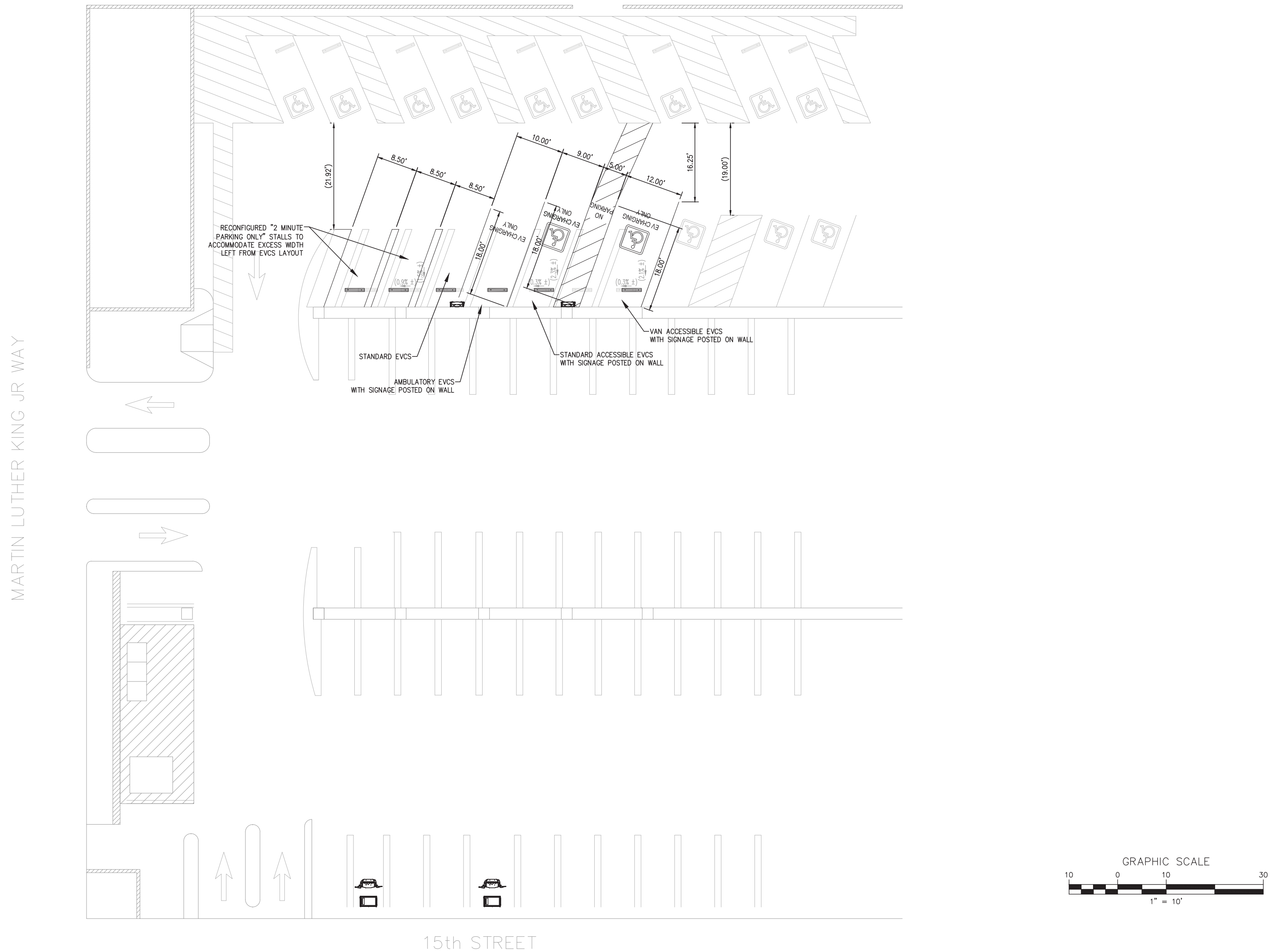
DIV	TRADE ITEM	AMOUNT	
150	SITE SPECIFIC WORK	3,000	
310	GENERAL	13,927	
320	ELECTRICAL	1,199,650	
	SUBTOTAL TRADE COSTS		1,216,577
	Contractor Mark Up (10%)		121,658
	Contigency (20%)		243,315
	TOTAL ESTIMATE AMOUNT - THIS SITE		**$ 1,581,550**

ESTIMATE SUMMARY

150	SITE SPECIFIC WORK	QTY	UM	UNIT	EXT	$ 3,000
	30-day load study		EA	3,000	-	
	Striping	1		3,000	3,000	
					-	
310	GENERAL	QTY	UM	UNIT	EXT	$ 13,927
	Core	13	EA	47.58	$618.54	
	Trenching	50	LF	116.16	$5,808.00	
	General Terms Fee	1	LS	7,500	7,500	
320	ELECTRICAL	QTY	UM	UNIT	EXT	$ 1,199,650
	New/Upgraded Service Fee	1	LS	$200,000	$200,000	
	Branch circuits to DCFC	2,500	LF	$32	$78,750	
	Feeder to Electrical Distribution boards	2,800	LF	$48	$133,000	
	New 3000A Meter CT Cabinet	1	EA	$20,000	$20,000	
	New 3000A Switch board with meter - Outdoor (including main and feeder breakers)	1	EA	$60,000	$60,000	
	75kW Tritium DC Fast Charger	15	EA	$35,000	$525,000	
	175kW Tritium DC Fast Charger	2	EA	$90,000	$180,000	
	Misc Electrical components (incl. grounding)	2	EA	$500	$1,000	
	Concrete Slab with Mechanical Protection Bollards	2	EA	$950	$1,900	

ADA CHARGING SPACES

Alternate 1 & 2


MARTIN LUTHER KING JR WAY
RECONFIGURED "2 MINUTE PARKING ONLY" STALLS TO ACCOMMODATE EXCESS WIDTH LEFT FROM EVCS LAYOUT
(21.92')
8.50'
8.50'
8.50'
10.00'
9.00'
5.00'
12.00'
16.25'
(19.00')
18.00'
18.00'
18.00'
EV CHARGING ONLY
EV CHARGING ONLY
NO PARKING
EV CHARGING ONLY
(0.9% ±)
(1.5% ±)
(0.3% ±)
(2.3% ±)
(0.3% ±)
(2.1% ±)
STANDARD EVCS
AMBULATORY EVCS WITH SIGNAGE POSTED ON WALL
STANDARD ACCESSIBLE EVCS WITH SIGNAGE POSTED ON WALL
VAN ACCESSIBLE EVCS WITH SIGNAGE POSTED ON WALL
15th STREET
GRAPHIC SCALE
10 0 10 30
1" = 10'

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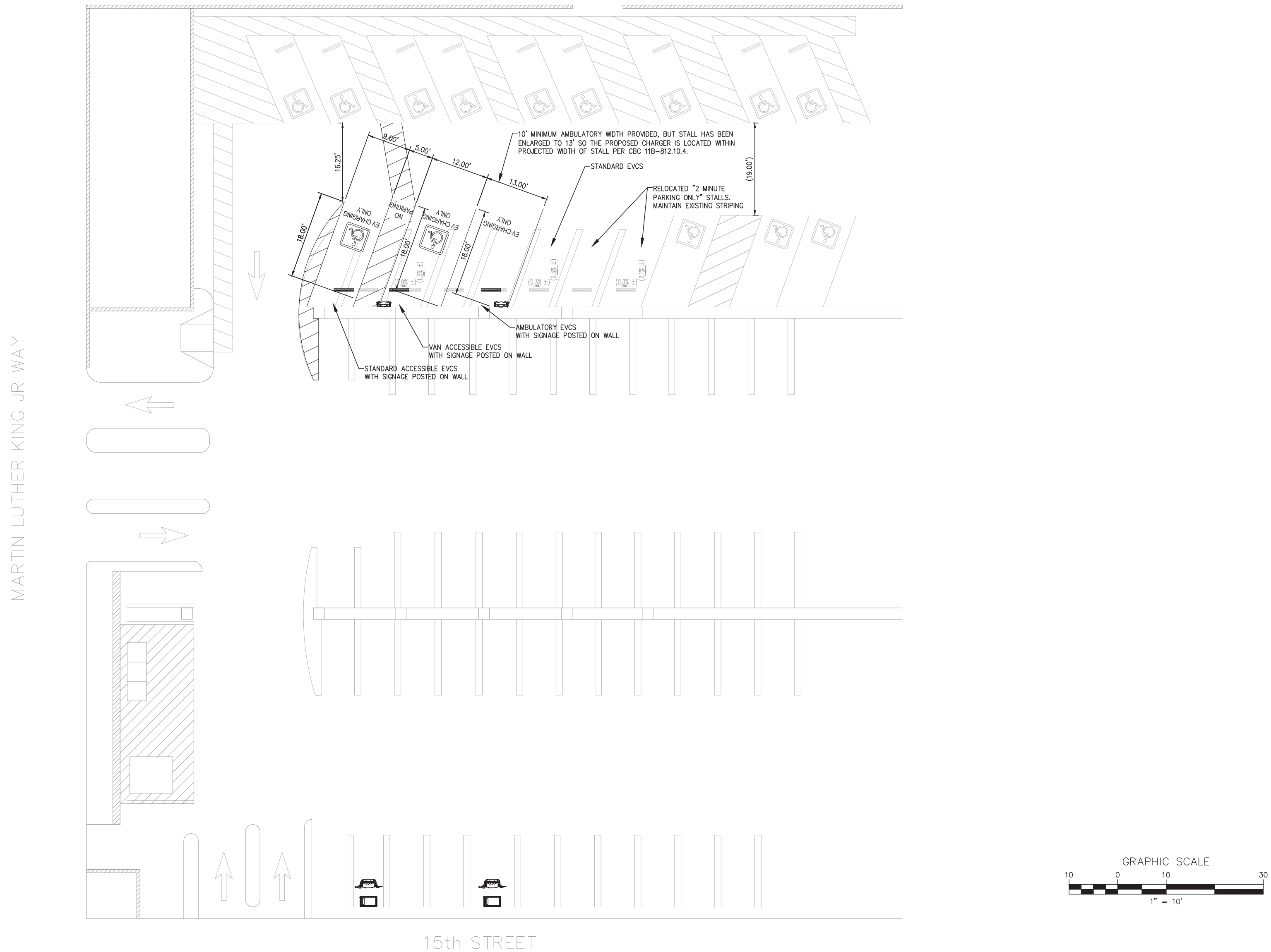
CITY CENTER GARAGE WEST

PARKING LEVEL 1

ADA CHARGING SPACES - ALTERNATE 1

3/10/2021


10' MINIMUM AMBULATORY WIDTH PROVIDED, BUT STALL HAS BEEN ENLARGED TO 13' SO THE PROPOSED CHARGER IS LOCATED WITHIN PROJECTED WIDTH OF STALL PER CBC 11B-812.10.4.
STANDARD EVCS
RELOCATED "2 MINUTE PARKING ONLY" STALLS. MAINTAIN EXISTING STRIPING
16.25'
9.00'
5.00'
12.00'
13.00'
(19.00')
18.00'
18.00'
18.00'
EV CHARGING ONLY
NO PARKING
EV CHARGING ONLY
EV CHARGING ONLY
(0.9% ±)
(1.5% ±)
(0.3% ±)
(2.3% ±)
(0.3% ±)
(2.1% ±)
AMBULATORY EVCS WITH SIGNAGE POSTED ON WALL
VAN ACCESSIBLE EVCS WITH SIGNAGE POSTED ON WALL
STANDARD ACCESSIBLE EVCS WITH SIGNAGE POSTED ON WALL
MARTIN LUTHER KING JR WAY
15th STREET
GRAPHIC SCALE
10
0
10
30
1" = 10'

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CITY CENTER GARAGE WEST

PARKING LEVEL 1

ADA CHARGING SPACES - ALTERNATE 2

3/10/2021