CULVER CITY BUS FACILITY
ELECTRIFICATION CONSTRUCTION

OCTOBER, 2022

SCOPE
1. SCOPE OF WORK IS LIMITED TO PHASES 1, 2, 4, AND 5, WHICH WILL BE AUTHORIZED SEPARATELY OVER PERIOD OF YEARS.
2. IN COORDINATION WITH SPACE FRAME INSTALLER AND THE UTILITY (SOUTHERN CALIFORNIA EDISON), INSTALL HVC 150 CHARGING CABINETS, DEPOT BOXES, CABLE REELS IN CONJUNCTION WITH PLANNED CCB DEPLOYMENT OF BATTERY ELECTRIC BUSES.
3. CONTRACTOR SHALL WORK WITH AECOM AND CULVER CITY BUS TO MEET REQUIREMENTS FOR CONTINUING OPERATION OF BUSES DURING CONSTRUCTION OF ELECTRICAL CHARGING INFRASTRUCTURE.

PROJECT DATA - BUS CHARGING SPACE FRAME
- OCCUPANCY GROUP = S1 (PARKING FACILITY)
- CONSTRUCTION TYPE = II-B - NON-SPRINKLED (NS PER TABLE 506.2)
- ALLOWABLE HEIGHT = 40’ (PER TABLE 504.3) / ACTUAL HEIGHT = 24’ (OK)
- ALLOWABLE # STORIES ABOVE GRADE = 1 (PER TABLE 504.4) / ACTUAL STORIES = 1 (OK)
- ALLOWABLE AREA, SINGLE OCCUPANCY, ONE-STORY BUILDING, 17,500 + (17,500 X 1.1) = 36,750 SF (SECTION 506.2.1, EQUATION 5-1)
- ACTUAL BUILDING AREA = 26,600 SF (OK)

AREA FACTOR INCREASE BASED ON FRONTAGE
(SECTION 506.3.2, EQUATION 5-4)
\[ A = \frac{453.75 \times (453.75 - 0.25 \times W)}{453.75 - 0.25 \times W} \]
\[ W = \frac{(212.75 \times 30 + 120.75 \times 30 + 212.75 \times 30 + 120.75 \times 30)}{453.75} \]
\[ = 1.1 \]
\[ A = \frac{453.75 \times 44.01}{453.75 - 0.25 \times 44.01} \]
\[ = 1.1 \]

MINIMUM FRONTAGE CALCULATION
(SECTION 506.3.2, EQUATION 5-4)
\[ W = \frac{(212.75 \times 30 + 120.75 \times 30 + 212.75 \times 30 + 120.75 \times 30)}{453.75} \*
\[ = 453.75 \]
\[ = 453.75 \]

DEFERRED SUBMITTALS BY CONTRACTOR
DEFERRED ITEMS: SPACE FRAME
DEFERRED ITEMS SHALL BE PREPARED, STAMPED, AND SIGNED BY A QUALIFIED PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE OF CALIFORNIA, THEN SUBMITTED TO THE ARCHITECT/STRUCTURAL ENGINEER FOR REVIEW AND COMMENT. AFTER REVIEW BY THE ARCHITECT/STRUCTURAL ENGINEER, ITEMS SHALL THEN BE SUBMITTED TO THE CULVER CITY BUILDING SAFETY DIVISION FOR PLAN REVIEW AND APPROVAL.

SEPARATE PERMIT BY CONTRACTOR
THE ELECTRICAL WORK WILL BE UNDER A SEPARATE SUBMITTAL, REVIEW, AND PERMIT.

APPLICABLE CODES
- 2019 CALIFORNIA ADMINISTRATIVE CODE
- 2019 CALIFORNIA BUILDING CODE - AMENDED PER TITLE 15 OF CCMC
- 2019 CALIFORNIA EXISTING BUILDING CODE
- 2019 CALIFORNIA ELECTRICAL CODE - AMENDED PER CCMC
- 2019 CALIFORNIA ENERGY CODE
- 2019 CALIFORNIA FIRE CODE - AMENDED PER CCMC
- 2019 CALIFORNIA GREEN BUILDING STANDARDS CODE - AMENDED PER CCMC
- 2019 CALIFORNIA MECHANICAL CODE - AMENDED PER CCMC
- 2019 CALIFORNIA PLUMBING CODE - AMENDED PER CCMC
- 2019 CALIFORNIA REFERENCED STANDARD CODE
- 2019 CALIFORNIA RESIDENTIAL CODE

ELECTRICAL
- E-001 ELECTRICAL NOTES
  - E-001 ELECTRICAL SITE PLAN - PHASE 1
  - E-012 ELECTRICAL SITE PLAN - PHASE 2
  - E-103 ELECTRICAL SITE PLAN - PHASE 4
  - E-104 ELECTRICAL SITE PLAN - PHASE 5
  - E-201 SPACE FRAME AND ISLAND LIGHTING PLAN
  - E-202 MAIN SUBSTATION AND ISLAND-ENLARGED PLAN
  - E-203 MAIN SUBSTATION AND ISLAND-EQUIPMENT GROUNDING PLAN
  - E-204 SWITCHBOARD SECTION AND ELEVATION
  - E-301 SINGLE LINE DIAGRAM 1 OF 2
  - E-302 SINGLE LINE DIAGRAM 2 OF 2
  - E-401 LOAD SUMMARIES AND FEEDER SCHEDULES
  - E-402 PANEL SCHEDULES
  - E-501 CHARGING CABINET AND DEPOT BOX SCHEDULE
  - E-502 EQUIPMENT RACK DETAILS
  - E-503 GROUNDING DETAILS
  - E-504 DUCTBANK DETAILS
  - E-505 CHARGING CABINET EQUIPMENT DETAIL
  - E-506 CHARGING CABINET AND LIGHTING CONTROL BLOCK DIAGRAM

PLUMBING
- NOT USED
NOTES:

1. Existing natural gas line to be removed within the limits of the sidewalk and curbed at the ends where possible.

2. Remove all items within sidewalk limits including but not limited to natural gas pipes, risers, valves, and light poles. See notes for details.
SITE PHOTOS

LIGHT POLES, BOLLARDS, EXISTING
STRIPING AND CNG PUMPS ON ISLAND

CLOSE-UP OF ISLAND WITH
BOLLARDS, AND CNG PUMPS
NOTES:
1. ALL ELECTRICAL EQUIPMENT TO BE CENTERED ON ISLAND.
2. REFER TO ELECTRICAL DRAWINGS FOR EQUIPMENT LAYOUT.
6" DIAM. GALVANIZED AND PAINTED STEEL PIPE (SCHEDULE 40) FILLED WITH CONCRETE. TOP OF BOLLARD SHALL BE 12" DIAM. CONCRETE DOME MADE WITH A SCREED TEMPLATE. PAINT SHALL BE 3-COAT EPOXY, TOTAL THICKNESS 20 MILS. COLOR: SAFETY YELLOW.
PHASE TO INCLUDE DIAGONAL STRIPING

PHASE TO INCLUDE

EXISTING FUEL ISLAND

SPACE FRAME LOWER GRID PLAN

0 10 20 30
0 10 20 30

BID SET 1 (W/O ELECT.)
ALL COLUMNS ON GRIDLINES 1, 2, & 3 ARE INCLUDED IN PHASE 1 WORK. TYPICAL.

DIMENSIONS TO BUILDINGS ARE APPROXIMATE AND ARE SHOWN FOR CODE COMPLIANCE PURPOSES ONLY. SEE CIVIL DRAWINGS FOR EXACT DIMENSIONS.

PHASE TO INCLUDE DIAGONAL STRIPING

EXISTING FUEL ISLAND

NEW ISLANDS FOR CHARGING EQUIPMENT BELOW
NOTES:

1. Exact spacing and placement of charging cabinets on island to be coordinated by contractor based upon locations of structural columns and within boundaries of housekeeping pads specified on Civil, Sheets C001, C002, C003, C004, C005.

2. Charger numbers on this document do not reflect initial charging cabinet installed as part of Culver City BID Pilot Phase.

3. For single line diagram and load summary, see Sheets E-301, E-302, and E-401.

4. Lighting level under space-frame shall meet 30 ft requirement. See lighting plan on Sheet E-201.

5. Furnish and install cable from switchboards to ABB charger cabinets, depot boxes, and cable reel disconnects and mini-power center to be mounted on galvanized uninsulated frames.

6. Work shall be coordinated with the contractor during detailed design of substation to ensure exact pad location and dimensions, equipment clearance, and conductor location. The co-ordination shall include distribution switchboard "DSW2", feeder conduit from switchboards to ABB charger cabinets, depot boxes, and cable reel disconnects and mini power center. See Light Plan on Sheet E-201.

7. Furnish and install energized raceway from switchboards to ABB charger cabinets per SI SHEET C001, SHEET C002.

8. Contact substation for exact substation location, dimension, and equipment requirement including fence and bollards.

9. Distribution switchboard "DSW2" is designated for blocks A.

10. Distribution switchboard "DSW3" is designated for block B.

11. Charging cabinet includes 125% continuous load factor.

12. Work on this sheet is shown in DArk lines. Work done under other phases is shown in light lines. Plans for clarity. Future work is shown in gray.

13. All conduit and support equipment to be painted to match space frame color.

14. Housekeeping pads to be formed under group equipment as shown on island, and meet weight and anchoring requirements of equipment being supported. Close coordination with civil and structural engineers to verify locations of equipment pad and island-interpretation.

15. See note 1, sheets E-301 and E-302, for other notes.

16. All feeders (conductors from switchboards "DSW2" and "DSW3" to the charger cabinet locations) shall be installed under Phase 1. Conduit work shall be installed under subsequent phases.

17. Electrical drawing dimensions are provided for schematic reference. For exact dimensions, refer to civil drawings.

NOTES (CONT.):

18. Label the cable tray, Space Frame Structure, Appendix.

19. For conduits & wires size, see Sheets E-301, E-302, and E-401.

20. For Manhole detail, see E-204.
NOTES:

1. FOR GENERAL NOTE, LEGEND AND ABBREVIATION, REFER TO SHEET E-001 AND E-101.
2. FOR CONDUIT & WIRE SIZE, SEE FEEDER SCHEDULES ON SHEETS E-301, E-302 & E-401.

DOUBLE GATE

CONCRETE-ENCASING DUCT BANKS

DISTRIBUTION SWITCHBOARD "DSW1"

DISTRIBUTION SWITCHBOARD "DSW2"

SCE LOOP SWITCH

ELECTRICAL SITE PLAN - PHASE 2

SCALE 1" = 15'
NOTES:
1. FOR GENERAL NOTE, LEGEND AND ABBREVIATION, REFER TO SHEET E-001 AND E-101.
2. FLOODLIGHT TO BE INSTALLED AT TOP OF SPACE FRAME IN ORDER TO PROVIDE ADJACENT LIGHTING TO EASTERN BUS PARKING AREA.
3. FLOODLIGHT TO BE REMOVED UNDER PHASE 4.
4. SPACE FRAME MOUNTED CANOPY LIGHT FIXTURE SHALL BE INSTALLED UNDER PHASE 1. SEE NOTE 6.
5. CANOPY LIGHT FIXTURE SHALL BE INSTALLED UNDER PHASE 4. SEE NOTE 6.
6. LIGHTING LEVEL UNDER SPACE-FRAME SHALL MEET 30 FC REQUIREMENT. FIXTURE SHALL BE VCPG LED 50W, 120V, LED FLOOD LIGHT MOUNTED ABOVE SPACE FRAME. PROVIDE POWER FROM MIN POWER CENTER MPC2 VIA LIGHTING CONTROL PANEL LCP.
7. 500W, 120V, LED FLOODLIGHT TO BE INSTALLED AT TOP OF SPACE FRAME. PROVIDE POWER FROM MIN POWER CENTER MPC2 VIA LIGHTING CONTROL PANEL LCP.

KEY NOTES:
1. 3/4"C, 2#10, 1#12 GND
2. 2"C, 8#10, 1#12 GND
3. 2"C, 12#10, 1#12 GND
4. 2"C, 2#10, 1#12 GND
5. SEE NOTES 3, 4 & 7
6. SEE NOTE 5
7. I/R ADDENDUM 1 10-14-2022

LIGHTING CONTROL PANEL LCP

EXISTING LED LIGHT

CABLE TRAY

FOR EQUIPMENT DESIGNATION & MOUNTING DETAIL, SEE

 existing LED

SEE NOTE 4, TYP

SEE NOTES 3, 4 & 7

SEE NOTE 5

SEE NOTE 6, TYP

LIGHTING CONTROL DIAGRAM

120V TO MCP2

NUMBER OF CONTRACTOR TO ACCOMMODATE LIGHTING PER MPC2 PANEL SCHEDULE

ACCOMMODATE CONTACTOR TO MPC2

PANEL SCHEDULE

CABLE TRAY

FOR EQUIPMENT DESIGNATION & MOUNTING DETAIL, SEE

See notes.

EXISTING LED LIGHT

CABLE TRAY

FOR EQUIPMENT DESIGNATION & MOUNTING DETAIL, SEE

See notes.

EXISTING LED LIGHT

CABLE TRAY

FOR EQUIPMENT DESIGNATION & MOUNTING DETAIL, SEE

See notes.
NOTES:

SCE SERVICE NOTES:

1. CONTRACTOR SHALL COORDINATE ALL WORK WITH SCE.

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 notes: 1.

FOR GENERAL NOTE, LEGEND AND ABBREVIATION, REFER TO SHEET E-001 AND E-101.

ACCESS GATE (TYP)

DISTRIBUTION SWITCHBOARD "DSW1" (PHASE 1)

DISTRIBUTION SWITCHBOARD "DSW2" (PHASE 4)

SCE LOOP SWITCH (PHASE 1)

MINI POWER CENTER "MPC1"

MINI POWER CENTER "MPC2"

MAIN SUBSTATION ENLARGED PLAN

SCALE: 1" = 5'-0"

CHARGING CABINET, SEE PLAN (TYP)

CABLE TRAY, SEE PLAN E-201

LIGHTING CONTROL PANEL "LCP"

ISLAND EQUIPMENT ENLARGED PLAN - PHASE 1

SCALE: 1" = 5'-0"

EXISTING BLOCK WALL (TYP)

SPACE FOR FUTURE SECTION

CHAIN LINK FENCE

NOTES:

1. CONTRACTOR SHALL COORDINATE ALL WORK WITH SCE.

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notes: 1.

FOR GENERAL NOTE, LEGEND AND ABBREVIATION, REFER TO SHEET E-001 AND E-101.

ACCESS GATE (TYP)

DISTRIBUTION SWITCHBOARD "DSW1" (PHASE 1)

DISTRIBUTION SWITCHBOARD "DSW2" (PHASE 4)

SCE LOOP SWITCH (PHASE 1)

MINI POWER CENTER "MPC1"

MINI POWER CENTER "MPC2"

MAIN SUBSTATION ENLARGED PLAN

SCALE: 1" = 5'-0"

CHARGING CABINET, SEE PLAN (TYP)

CABLE TRAY, SEE PLAN E-201

LIGHTING CONTROL PANEL "LCP"

ISLAND EQUIPMENT ENLARGED PLAN - PHASE 1

SCALE: 1" = 5'-0"

EXISTING BLOCK WALL (TYP)

SPACE FOR FUTURE SECTION

CHAIN LINK FENCE

NOTES:

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notes: 1.

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ACCESS GATE (TYP)

DISTRIBUTION SWITCHBOARD "DSW1" (PHASE 1)

DISTRIBUTION SWITCHBOARD "DSW2" (PHASE 4)

SCE LOOP SWITCH (PHASE 1)

MINI POWER CENTER "MPC1"

MINI POWER CENTER "MPC2"

MAIN SUBSTATION ENLARGED PLAN

SCALE: 1" = 5'-0"

CHARGING CABINET, SEE PLAN (TYP)

CABLE TRAY, SEE PLAN E-201

LIGHTING CONTROL PANEL "LCP"

ISLAND EQUIPMENT ENLARGED PLAN - PHASE 1

SCALE: 1" = 5'-0"
GROUNDBED CONDUCTOR, 24" BELOW GRADE. #4/0 BARE COPPER, UON.

GROUND ROD & WELL, COPPER CLAD STEEL GROUND ROD.

CADWELD BONDING CONNECTION.

GROUNDR LEGEND:

1. FOR GENERAL NOTE, LEGEND AND ABBREVIATION, REFER TO SHEET E-001 AND E-101.

NOTES:

GROUNDING PLAN

SCALE: 1" = 10'-0"

NOTES:

1. FOR GENERAL NOTE, LEGEND AND ABBREVIATION, REFER TO SHEET E-001 AND E-101.

GROUNDING LEGEND:

GROUND CONDUCTOR, 24" BELOW GRADE. #4/0 BARE COPPER, UON.

GROUND ROD & WELL, COPPER CLAD STEEL GROUND ROD.

CADWELD BONDING CONNECTION.

GROUNDBED CONDUCTOR, 24" BELOW GRADE. #4/0 BARE COPPER, UON.

GROUND ROD & WELL, COPPER CLAD STEEL GROUND ROD.

CADWELD BONDING CONNECTION.

NOTES:

GROUND CONDUCTOR, 24" BELOW GRADE. #4/0 BARE COPPER, UON.

GROUND ROD & WELL, COPPER CLAD STEEL GROUND ROD.

CADWELD BONDING CONNECTION.
NOTES:

1. SWITCHBOARD BREAKER DETAILS SHOWN ARE GRAPHICAL REPRESENTATION ONLY. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR APPROVAL BY EOR AS DESCRIBED IN PROJECT SPECIFICATION 26 24 13.

2. SWITCHBOARD BREAKER DETAILS SHOWN ARE GRAPHICAL REPRESENTATION ONLY. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR APPROVAL BY EOR AS DESCRIBED IN PROJECT SPECIFICATION 26 24 13.

DISTRIBUTION SWITCHBOARD "DSW1" ELEVATION ("DSW2" SIMILAR)

SCALE: NOT TO SCALE

DISTRIBUTION SWITCHBOARD "DSW1" PLAN ("DSW2" SIMILAR)

SCALE: NOT TO SCALE
NOTES:

1. UNDER PHASE 1, SCE SHALL PROVIDE UNDERGROUND 4" CONCRETE-ENCASED DUCT BANKS FROM UTILITY FEEDER 2 TO THE TRANSFORMER PAD. TRANSFORMER PAD AND CONDUIT TO SWITCHBOARD FULL-SECTION LOCATION TO BE PROVIDED BY SCE. TRANSMISSION AND DISTRIBUTION REQUIREMENTS SHALL BE INSTALLED AND VERIFIED BY SCE. SCE SHALL PROVIDE BUS WITH EXPANSION CAPABILITY.

2. CONDUIT UNDER PHASE 1, CABLES, CIRCUIT BREAKERS AND EQUIPMENT UNDER PHASE 4 (EXCEPT WHERE NOTED)

3. PROVIDE BUS WITH EXPANSION CAPABILITY.

PHASE 4 - 2026

(Except where noted)

SINGLE LINE DIAGRAM

SCALE: 1" = 15'-0"

E-302

DRAWN BY: A. JABBAR

DESIGNED BY: O. GUZMAN

REVISED: 09/23

Center for Transportation and the Environment (CTE)
730 Peachtree St., Suite 450
Atlanta, GA 30308
(404) 893-9000
www.cte.tv

AN SQL-OWNED DISTRIBUTION SWITCHBOARD "DSW2" NEMA 3R (INSTALLED UNDER PHASE 4)

CONDUITS UNDER PHASE 1, CABLES, CIRCUIT BREAKERS AND EQUIPMENT UNDER PHASE 4 (EXCEPT WHERE NOTED)

BAG DEPOT BOX, TYP

BUS B6/B11 150 KV

BUS B6/B12 150 KV

BUS B6/B18 150 KV

BUS B6/B19 150 KV

BUS B6/B20 150 KV

BUS B6/B21 150 KV

BUS B6/B22 150 KV

BUS B6/B23 150 KV

BUS B6/B24 150 KV

BUS B6/B25 150 KV

BUS B6/B26 150 KV

TO MINI POWER CENTER "MPC1" SEE SHEET E-301

DISTRIBUTION SWITCHBOARD "DSW2" NEMA 3R (INSTALLED UNDER PHASE 4)

DISTRIBUTION SWITCHBOARD "DSW2" NEMA 3R (INSTALLED UNDER PHASE 4)

PHASE 5 - 2026

(Except where noted)
### FEEDER SCHEDULE

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<td>480</td>
<td>3</td>
<td>Copper</td>
<td>POC</td>
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<td>PHASE 4</td>
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<td>Copper</td>
<td>POC</td>
<td>1</td>
<td>P2</td>
<td>4%</td>
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</table>

**NOTES:**

1. **SCORE OF WORK IS LIMITED TO PHASE 1. DATA SHOWN FOR PHASES 2, 4, AND 5 IS FOR INFORMATION ONLY AND ARE NOT FOR AUTHORIZATION.

2. **POWER CABINET INCLUDES 125% CONTINUOUS LOAD FACTOR.
### Panel: MPC1

<table>
<thead>
<tr>
<th>Location</th>
<th>Chg.</th>
<th>Phase</th>
<th>Load Type</th>
<th>Type</th>
<th>Current</th>
<th>KVA</th>
<th>KVAR</th>
<th>KVA VAR</th>
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<td>8.200 A</td>
<td>5.000 A</td>
<td>0.000 A</td>
<td>0.000 A</td>
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</tr>
<tr>
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<td>1</td>
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<td>0.000 A</td>
<td>0.000 A</td>
</tr>
<tr>
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<td>0.000 A</td>
<td>0.000 A</td>
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#### Load Ref: LOAD - 1

- **Type**: 1.00 A
- **KVA**: 8.200 A
- **KVAR**: 0.000 A
- **KVA VAR**: 0.000 A

#### Load Ref: LOAD - 2

- **Type**: 0.00 A
- **KVA**: 0.000 A
- **KVAR**: 0.000 A
- **KVA VAR**: 0.000 A

**Total**:

- **KVA**: 8.200 A
- **KVAR**: 0.000 A
- **KVA VAR**: 0.000 A

---

### Panel: MPC2

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<th>Type</th>
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<th>KVA</th>
<th>KVAR</th>
<th>KVA VAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8.200 A</td>
<td>5.000 A</td>
<td>0.000 A</td>
<td>0.000 A</td>
</tr>
<tr>
<td>A2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8.200 A</td>
<td>5.000 A</td>
<td>0.000 A</td>
<td>0.000 A</td>
</tr>
<tr>
<td>A3</td>
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<td>1</td>
<td>1</td>
<td>1</td>
<td>8.200 A</td>
<td>5.000 A</td>
<td>0.000 A</td>
<td>0.000 A</td>
</tr>
<tr>
<td>A4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>8.200 A</td>
<td>5.000 A</td>
<td>0.000 A</td>
<td>0.000 A</td>
</tr>
</tbody>
</table>

#### Load Ref: LOAD - 1

- **Type**: 1.00 A
- **KVA**: 8.200 A
- **KVAR**: 0.000 A
- **KVA VAR**: 0.000 A

#### Load Ref: LOAD - 2

- **Type**: 0.00 A
- **KVA**: 0.000 A
- **KVAR**: 0.000 A
- **KVA VAR**: 0.000 A

**Total**:

- **KVA**: 8.200 A
- **KVAR**: 0.000 A
- **KVA VAR**: 0.000 A

---

**Project Information**

- **Project Name**: CULVER CITY BUS ELECTRIFICATION TRANSITION PLAN
- **Owner**: CITY OF CULVER CITY, CA
- **Prime Consultant**: Center for Transportation and the Environment (CTE)
- **Architect/Engineer**: Kieser, Feller, Lake, Maki
- **Prime Consultant**: Center for Transportation and the Environment (CTE)
- **CTE Website**: www.culvercitybus.com
- **No. of Ckt**: 12
- **No. of Loads**: 12

---

**Contact Information**

- **CTE Website**: www.culvercitybus.com
- **Phone**: (310) 264-4170
- **Fax**: (310) 264-4172

---

**Regulation**

- **Registration**: 2017
- **Regulator**: California Public Utilities Commission

---

**Table Note**

- **Total KVA**: 8.200 A
- **Total KVAR**: 0.000 A
- **Total KVA VAR**: 0.000 A

---

**Diagram Note**

- **Diagram Legend**
- **Diagram Scale**: 1/100

---

**Sheet Information**

- **Sheet Title**: PANEL SCHEDULES
- **Sheet Number**: E-402
- ** Sheet Title**: PANEL SCHEDULES
- **Sheet Number**: E-402

---

**Acknowledgments**

- **Acknowledgments**: Designed By: A. Debacker
- **Printed By**: R. S. Boardman
1. CHARGING CABINET AND DEPOT BOXES TO BE INSTALLED PER ABB INSTALLATION MANUAL.

2. ALL PHYSICAL ATTACHMENTS WILL BE MADE WITH APPROVED ANCHORS.

3. CONCRETE FOUNDATION TO BE BUILT TO TOLERATE WEIGHT OF CHARGING CABINET, IN ACCORDANCE WITH LOCAL AND STATE BUILDING CODE.

4. CABLE REEL SELECTION SHALL ENABLE BUS OPERATORS TO EASILY DROP CHARGING HANDLE TO CHARGING PORT ON BUS AT EVERY CHARGING LOCATION.

NOTES

CHARGING CABINET - CONDUIT STUB-UP LOCATION
(ABB DETAIL - PG 40)

SCALE: N.T.S.

FRONT SIDE

A. FIXATION HOLES (SIZE: M16).
B. CABLE ENTRY AREA (AC SIDE).
C. CABLE ENTRY AREA (DC SIDE).

CONDUIT UP TO CABLE TRAY: SEE DETAIL ON E-005

DC CONDUITS & WIRES, SEE SHEETS E-301 & E-302

COMM CONDUIT & WIRES, SEE SHEETS E-301 & E-302

REMOVABLE BASE FRONT COVER

CONDUITS TO MAIN SWITCHBOARD DISTRIBUTION, FOR SIZE, SEE SHEETS E-301 & E-302

FRONT OF CHARGING CABINET

SIDE GLAND PLATE, (TOP BOTH SIDES)

REAR GLAND FOR CONDUIT KNOCKOUTS

CHARGING CABINET ELEVATION

SCALE: 1" = 1'-0"
EQUIPMENT RACK MOUNTING DETAIL

SCALE: NONE

NOTES

1. PROVIDE #40 GREEN INSULATED COPPER IN 1/2" RUS CONDUIT SLEEVES FOR PROTECTION ABOVE GRADE. CONDUIT SHALL BE 8" ABOVE FINISHED GRADE, EXCERPTING SEND TO ALL DEVICES AND TO GROUP LOOP PIGTAILS.

2. 6' X 6' X 1/2" SQUARE TUBE STEEL FILLED WITH CONCRETE. PAINT WITH (2) COATS OF ZINC PRIMER AND (2) FINISH COATS MATCHING SPACE FRAME FINAL PAINT COLOR. EXTEND 12" INTO GROUND. PROVIDE 3" MIN. CONCRETE ENCASEMENT OF STEEL SUPPORT UNDERGROUND.

3. PROVIDE #4/0 BARE COPPER (TYP) GROUND LOOP SYSTEM.

4. PANELS AND CABINETS ARE SHOWN DIAGRAMMATIC ONLY. ADJUST SIZE OF RACK TO MAINTAIN MINIMUM 6" SPACING BETWEEN EQUIPMENT.

5. PROVIDE HOUSEKEEPING PAD AS SHOWN ON PLANS AND IN SITUATIONS EQUIPMENT TOUCHES THE GROUND. HOUSEKEEPING PAD TO BE MINIMUM 1" THICK CONCRETE UNDER OVERALL EQUIPMENT SIZE. PROVIDE CONCRETE FOR THE DEPTH OF THE PAD AND 6" BEYOND THE RACK/EQUIPMENT IN ALL OTHER DIRECTIONS.

6. SUBMIT SHOP DRAWING FOR EQUIPMENT RACK INSTALLATION DETAIL FOR ENGINEER REVIEW.

7. ALL OUTDOOR ELECTRICAL EQUIPMENT SHALL BE NEMA 3R PER N.E.C. REQUIREMENTS.
**CADWELD TYPE "TA"**
BARE COPPER CABLE
GROUND CABLE TEE CONNECTION

**CADWELD TYPE "RH"**
BARE COPPER CABLE
REBAR

**CADWELD TYPE "RN"**
REBAR
BARE COPPER CABLE
GROUND ROD CONNECTION (NO GROUND WELL)

**GROUND ROD AND WELL**
BARE COPPER CABLE
GROUND CABLE CONNECTOR TO GROUND ROD

**EXOTHERMIC WELD**
CONNECTION
GROUND ROD TO VERTICAL CHANNEL SURFACE

**FENCE SUPPORT & GRADING DETAIL**
GALVANIZED STEEL PIPE POST
UL LISTED GROUND WIRE CLAMP BRASS PLATE OR APPROVED EQUAL

**GROUND CABLE CONNECTOR TO EQUIPMENT ENCLOSURE**
CENTRALIZED GROUND WIRE CLAMP BRASS PLATE OR APPROVED EQUAL

**BACKGROUND DETAILS**
CABLE TO GROUND ROD
CABLE TO VERTICAL CHANNEL SURFACE
GROUND CABLE TEE CONNECTION
GROUND CABLE CONNECTOR TO GROUND ROD
**DETAIL 1 NOTES**

1. Top of concrete to match top of existing pavement. Pavement repair shall be used for trenching and over vaults.
2. Concrete shall be in accordance with structural specifications.

**TYPICAL SECTION - DUCTBANK OR BURIED CONDUIT IN EXISTING CONSTRUCTION**

**SCALE: NONE**

**COVER PLATE (NOTES 10, 11)**

- 34" Diameter Ductile Iron
- Backfill Material Compacted to 95% Density
- 2-Sack Mix Slurry

**NOTES & 8**

- #4 Ground Wire Strap To Wall
- Galvanized Steel Step
- Galvanized Steel Ladder, Ground With #4 Wire, Anchor Ladder To Floor
- Pulling Iron, Typical
- #4S Ground Wire

**EXOTHERMIC WELD CONNECTION (TYP)**

- Compact Crushed Rock, 3/4" Max Size

**SECTION**

**TYPICAL ELECTRICAL MANHOLE DETAIL**

**SCALE: NONE**

**PLAN**

<table>
<thead>
<tr>
<th>NOTES</th>
</tr>
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<tbody>
<tr>
<td>1. REFER TO PLAN LAYOUTS AND FEEDER SCHEDULE FOR CONDUIT/CIRCUIT TYPE, QUANTITY.</td>
</tr>
<tr>
<td>2. COORDINATE DEPTH WITH OTHER WORK AND EXISTING CONDITIONS.</td>
</tr>
<tr>
<td>3. REFER TO FEEDER SCHEDULE VOLTAGE/CONTROL COLUMN FOR CONDUIT GROUPING DETERMINATION. ALL VOLTAGE DESIGNATIONS ABOVE 1200V TO BE GROUPED WITH ELECTRICAL CONDUITS. CIRCUITS LABELED AS CONTROL, WILL BE GROUPED WITH OTHER COMMUNICATIONS CONDUITS.</td>
</tr>
<tr>
<td>4. PROVIDE 1/2&quot; MINIMUM SPACING BETWEEN ELECTRICAL POWER AND CONTROL CONDUITS.</td>
</tr>
<tr>
<td>5. PROVIDE 3&quot; MINIMUM SPACING BETWEEN CONDUITS OF SIMILAR VOLTAGE.</td>
</tr>
<tr>
<td>6. MINIMUM SPACING REMAINS AT 3&quot; BUT MAY BE LARGER (OR IN SEPARATE DUCT BANK) TO ACCOMMODATE LAYOUT AND OTHER UTILITY CONDUITS.</td>
</tr>
<tr>
<td>7. PROVIDE 36&quot; MINIMUM COMPACTED BACKFILL COVER OF ALL DUCT BANKS AND UNDERGROUND CONDUITS.</td>
</tr>
<tr>
<td>8. PROVIDE RING EXTENSION AS REQUIRED.</td>
</tr>
<tr>
<td>9. NEW MANHOLE ELEVATIONS SHALL MATCH ELEVATION OF GRADE.</td>
</tr>
<tr>
<td>10. COVER SHALL BE MARKED &quot;ELECTRIC&quot;.</td>
</tr>
<tr>
<td>11. VEHICULAR TRAFFIC RATED COVER &amp; BOX (H-20).</td>
</tr>
<tr>
<td>12. BACKFILL THE ENTIRE DISTURBED AREA AROUND THE MANHOLE WITH 2 SACK SLURRY.</td>
</tr>
<tr>
<td>13. PROVIDE GROUND ROD AND #4/BARE COPPER AROUND ELECTRIC PULL BOX AND BEND ALL EXPOSED HARDWARE.</td>
</tr>
<tr>
<td>14. GROUND ROD PENETRATION TO BOTTOM OF PULL BOX SHALL BE SEALED.</td>
</tr>
</tbody>
</table>

**DETAIL 2 NOTES**

- 34" Minimum Depth, Exact Depth To Be Coordinated With Civil, Structural, And Existing Conditions, Depth Less Than 36" Must Be Approved By Engineer.
- Conduit Spacers Shall Be Used In Accordance With The Specifications.
- Conduits Placed In Trench To Be Inspected Prior To Pouring Concrete.

**TYPICAL SECTION - CONCRETE ENCASED DUCTBANK**

**SCALE: NONE**

**END WALL**

- 2-1/2" Typical
- 2-Sack Mix Slurry

**SIDE WALL**

- 1/16" Circular Sump Cavity
- Galvanized Pulling Iron Device (TYP)
- Install Cable Racks At 1' Separation Along Both End And Side Walls
- Low Voltage Conduit Per Plan (TYP)
- #40 Ground Wire, Type V

**DUCTILE IRON COVER PLATE (NOTE 11)**

- 2-1/2" Typical
- Center Coordinate
- Bond #40 Ground Wire To Cable Rack, TYP
- Bond #40 Ground Wire, #40 with #40 Ground Rod
- Provide 3' (NOTES 8 & 9)

**SIDE WALL**

- 8'-0"

**END WALL**

- 8'-0"
KEYNOTES:

1. Charging depot box and charging cable reel supported on strut framing in accordance with manufacturer's guidelines. Depot box shall be coordinated with bus parking position to ensure proper charging.

2. Charging cabinet. See plan for location. Anchorages shall be in accordance with manufacturer's recommendation.

3. Conduit supported by aluminum strut anchored between bottom chord of space frame.

4. Cable support retractable reel spring balance shall be sized to accommodate charging cable and connector. Exact height of pull down access shall be coordinated in the field.

---

### Spaceframe E-505

- **Charging Cabinet**: See equipment detail for alignment.
- **Charging Status Indicator Lamp**: 3C (DC Power)
- **Cable Support Retraction System**: DEPOT BOX, DC POWER, AUXILIARY POWER, AND COMM. CONDUITS. SEE PLANS FOR SIZE
- **Conduit and Cable**: ABB CHARGING CABINET, MINI POWER CENTER "MPC1" AND "MPC2", LIGHTING CONTROL PANEL "LCP" (BEYOND. SEE PLANS)
- **Guarding and Support**: #1/0 GREEN GROUND WIRE BONDED TO STEEL POST & METAL UNISTRUT SUPPORT
- **Grounding**: #4/0 BARE COPPER GRID, SEE SHEET 203
- **Exothermic Bond**: TO STEEL POST
- **Column Foundation**: SEE STRUCTURAL PLAN
- **Depot Box, DC Power, Auxiliary Power, and Comm. Conduits**: SEE PLANS FOR SIZE
- **DC Power and Comm Conduits**: MIN POWER CENTER "MPC1" AND "MPC2" LIGHTING CONTROL PANEL "LCP" (BEYOND. SEE PLANS)
- **Power and Communication Cables**: ALSO POWER CENTER "MPC1" AND "MPC2" LIGHTING CONTROL PANEL "LCP" (BEYOND. SEE PLANS)
- **Cable Tray**: 2-TIER LADDER TYPE CABLE TRAY.

---

**SUSTAINABLE ENERGY**

Sage Energy Consulting, an NV5 company
101 Lucas Valley Road, Suite 302
(415) 663-9914 tel
www.sagerenew.com / www.nv5.com

**PRIME CONSULTANT**

Center for Transportation and the Environment (CTE)
730 Peachtree St., Suite 450
Atlanta, GA  30308
(678) 244-4150 tel
https://cte.tv

**Kaiser Center, Lake Merritt**
**CULVER CITY**
**BUS FACILITY**
**ELECTRIFICATION CONSTRUCTION**

---

**BUILDING NAME**: 9815 JEFFERSON BLVD
CULVER CITY, CA 90232

**CITY OF CULVER CITY, CA**
TRANSPORTATION DEPARTMENT
4343 Duquesne Avenue
Culver City, CA 90232
310.253.6593 tel
www.culvercitybus.com

**OWNER**

CULVER CITY BUS FACILITY ELECTRIFICATION CONSTRUCTION

---

**ARCHITECT / ENGINEER**

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**CONTRACTOR**

Culver City Transportation and the Environment (CTE)
730 Peachtree St., Suite 450
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(678) 244-4150 tel
https://cte.tv

---

**DESIGNER**: A. JABBAR
**DRAWN BY**: O. GUZMAN
**DEPT CHECK**: B. MASCARDO
**PROJ CHECK**: T. BLAUVELT
**DATE**: 6/8/2022

---

**SCALE**: 1" = 10'-0"
<table>
<thead>
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<th>Conduit Ids</th>
<th>Function of Internal Cables</th>
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<tr>
<td>A</td>
<td>AC Primary Power</td>
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<td>Upstream OCPD Rated 300A</td>
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<tr>
<td>1, 3</td>
<td>DC Power (200A)</td>
<td>(2) 3/0 (CU, DLO, 90°C, 1KV) + (1) #6 (CU, EGC, 600V)</td>
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<td>2</td>
<td>Interlock (Shielded)</td>
<td>(1) Cable That Has (1) Twisted Pair of #18 (Shielded, 600V)</td>
<td>ST Connectors on all ends</td>
</tr>
<tr>
<td></td>
<td>Fiber Can</td>
<td>(1) Multimode Fiber (OM3, 8 Strands)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ethernet Can</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Fiber Can</td>
<td>(1) Multimode Fiber (OM3, 4 Strands)</td>
<td>RJ45 Connectors on all ends</td>
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<td>Ethernet</td>
<td>(1) Ethernet (S/FTP, CAT6/CAT5e)</td>
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</tr>
<tr>
<td></td>
<td>Interlock (Shielded)</td>
<td>(1) Cable That Has (2) Twisted Pair of #18 (Shielded, 600V)</td>
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<tr>
<td>7</td>
<td>DC Guard</td>
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<td>7</td>
<td>AC Auxiliary Power</td>
<td>(1) Cable That Has (2) #10 (CU, THWN, 75°C, 600V) + (1) #10 CU EGC</td>
<td>Upstream OCPD Rated 20A, 120V</td>
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