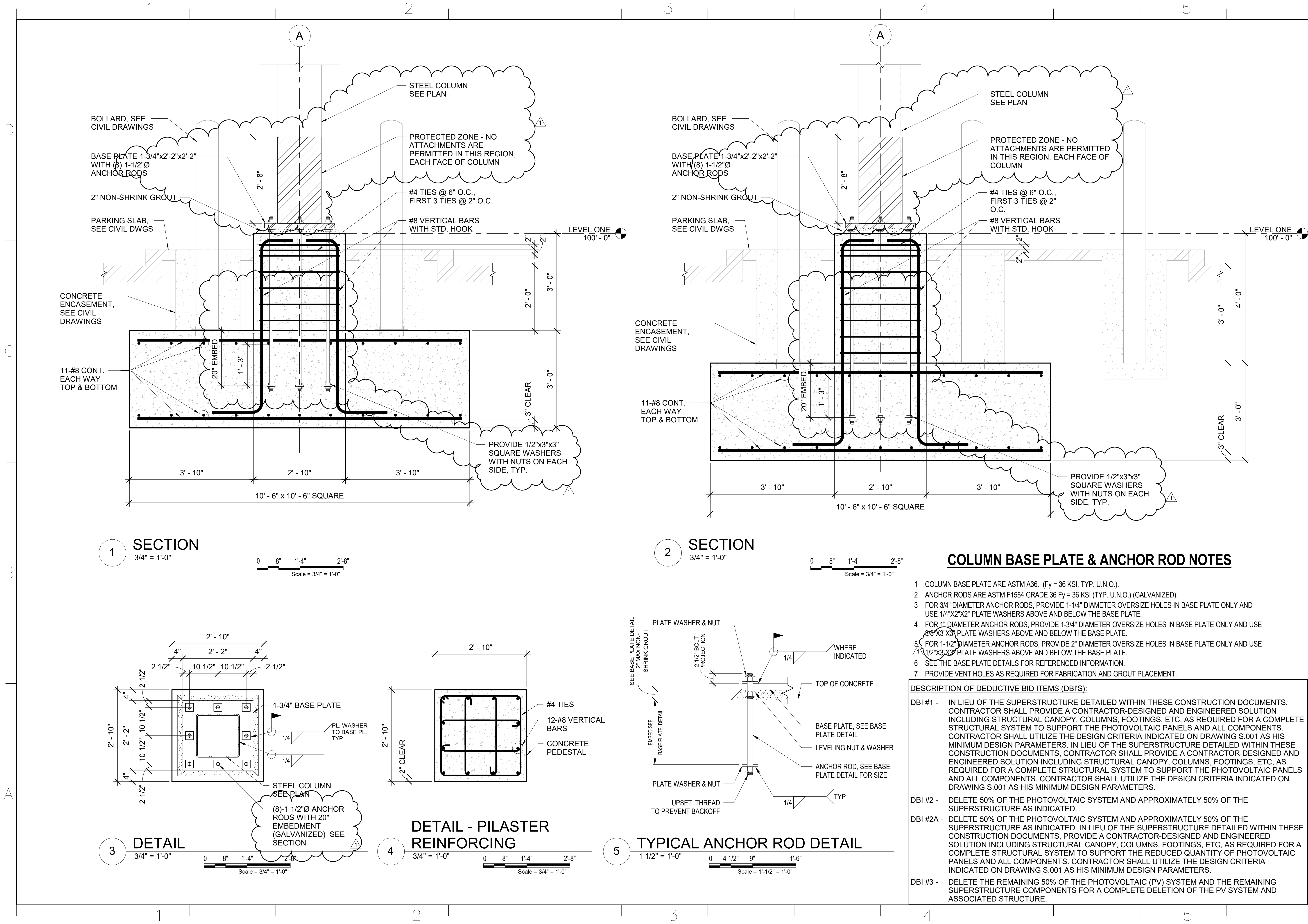


c:\Revit_Local\314202\KALAE0AB29 PARKING-CF2020.RVT



1250 N. PONTIAC TRAIL WALLED LAKE, MI 48390
WESTHEIMER, HOUSTON, TX 77042
8400 N. BROADWAY, OKLAHOMA CITY, OK 73114
625 EMERSON ROAD, ST. LOUIS, MO 63141
60 PLATO BOULEVARD E. ST. PAUL, MN 55107
ONE WEST THIRD STREET, TULSA, OK 74103



THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION
EXPIRATION DATE OF LICENSE: 04/30/2022

SYN	DESCRIPTION	DATE	APR
1	ADDENDUM NO. 1	6/2/2020	MCB

SUBMITTAL PHASE
100% FINAL BID SET

SUBMITTAL DATE: 03/17/2020

DES: HMH DRW: JDF CHK: JDW

DEPARTMENT OF DEFENSE
FACILITIES DESIGN & PROJECT BRANCH
KALAELOA, KAPOLEI, OAHU, HAWAII

HAWAII ARMY NATIONAL GUARD

FACILITY MANAGEMENT OFFICE

91-1387 SARATOGA AVENUE

BUILDING 29 PARKING PHOTOVOLTAIC SYSTEM, SITE IMPROVEMENTS AND MISCELLANEOUS EXTERNAL AND INTERNAL IMPROVEMENTS

STRUCTURAL

BASE BID FOUNDATION SECTIONS & DETAILS (DBI #1, 2, 2A, 3)

T.M.K. NO. 8-1413.045

SCALE: As indicated

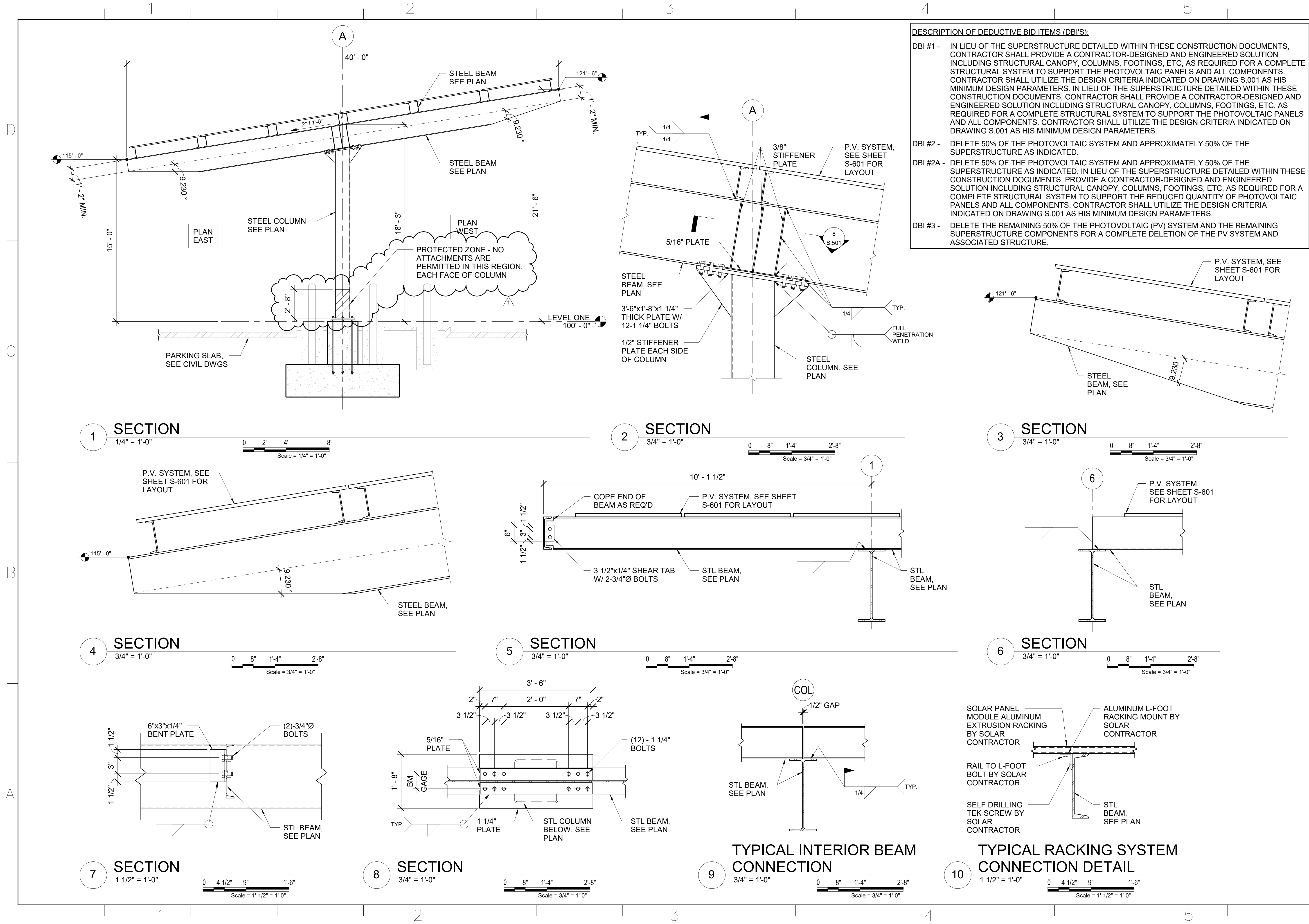
STATE JOB NO. CA-1512-C


FEDERAL PROJECT NO. 314202

SHEET 67

S.301

c:\Revit_Local\314202\S-314202-KALAE0AB29 PARKING-CF2020.RVT





BENHAM
A Harsco Company

1250 N. PONTIAC TRAIL WALLED LAKE MI 48380
WESTHEIMER HOUSTON TX 77042
8400 N. BROADWAY OKLAHOMA CITY OK 73114
625 EMERSON ROAD ST. LOUIS MO 63141
60 PLATO BOULEVARD E.S.T. PAUL MN 55107
ONE WEST THIRD STREET TULSA OK 74103

JOHN D. WESTERHEIMER
LICENSED PROFESSIONAL ENGINEER
No. 13074-S
6/2/20
HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION
EXPIRATION DATE OF LICENSE: 04/30/2022

SYN	DESCRIPTION	DATE	APR
1	ADDENDUM NO. 1	6/2/2020	MCB

SUBMITTAL PHASE: 100% FINAL BID SET

SUBMITTAL DATE: 03/17/2020

DES: HHM DRW: JDF CHK: JDW

DEPARTMENT OF DEFENSE
HAWAII ARMY NATIONAL GUARD
FACILITIES DESIGN & PROJECT BRANCH
KALAELOA, KAPOLEI, OAHU, HAWAII
BUILDING 29 PARKING PHOTOVOLTAIC SYSTEM, SITE IMPROVEMENTS AND MISCELLANEOUS EXTERNAL AND INTERNAL IMPROVEMENTS
STRUCTURAL
BASE BID FRAMING SECTIONS & DETAILS (DBI #1, 2, 2A, 3)

STATE OF HAWAII
FACILITY MANAGEMENT OFFICE
91-1387 SARATOGA AVENUE
TULSA, OK
9-1013-045

SCALE: As indicated

STATE JOB NO. CA-1512-C

FEDERAL PROJECT NO. 314202

SHEET 501

D
C
B
A

A

1

2

3

4

5

C

C

B

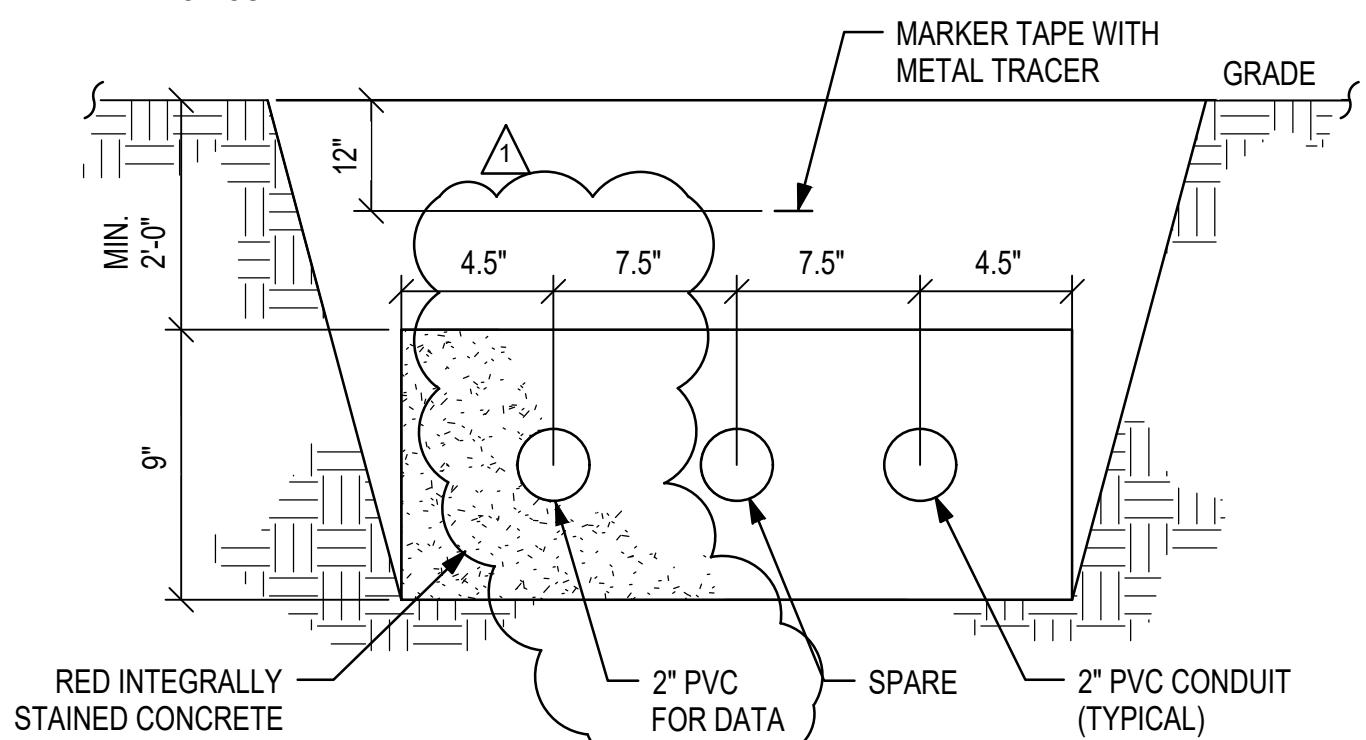
A

SHEET NOTES:

- UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THEREFORE, THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS NOT PRESENTLY KNOWN. BEFORE STARTING ANY WORK, LOCATE AND PROTECT ALL EXISTING BURIED UTILITY LINES, WHETHER OR NOT SHOWN ON THESE DRAWINGS, DURING THE COURSE OF CONSTRUCTION.
- COORDINATE CONSTRUCTION OF PHOTOVOLTAIC (PV) SYSTEM DUCTBANK WITH EXISTING UTILITIES AND IRRIGATION SYSTEM PIPING.
- REFER TO ONE-LINE DIAGRAM, SHEET E.601 FOR FEEDER SIZES.

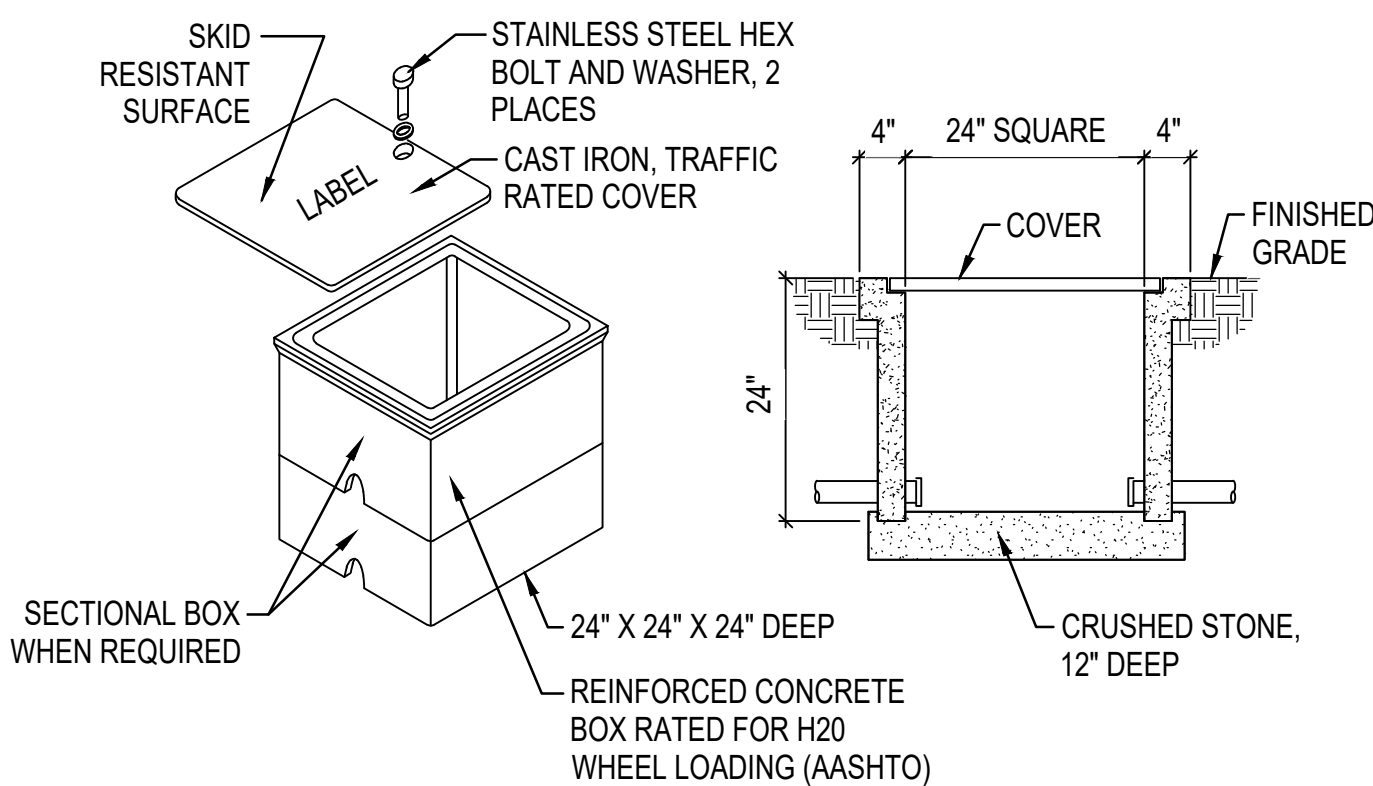
KEYED NOTES:

- PROVIDE PRECAST HANDHOLE FOR PV SYSTEM FEEDER. SEE DETAIL 3 BELOW.
- EXTEND (3) 2" CONDUITS, FROM HANDHOLE TO ELECTRICAL ROOM AS FOLLOWS:
 - ROUTE TWO (2) CONDUITS TO MAIN SWITCHBOARD (MSB) AND STUB-UP INTO BOTTOM OF ONE CONDUIT SHALL BE USED FOR PV SYSTEM POWER WIRING AND ONE CONDUIT SHALL BE A SPARE.
 - ROUTE ONE (1) CONDUIT TO ELECTRICAL ROOM INTERIOR WALL AND EXTEND UP INTO CEILING SPACE FOR PV SYSTEM DATA WIRING. PROVIDE TWO (2) 2" CONDUIT SLEEVES ABOVE CEILING IN EXISTING FIRE RATED CORRIDOR WALLS TO FACILITATE DATA WIRING INSTALLATION FROM COMMUNICATIONS ROOM TO PV SYSTEM INVERTERS.
 - CONTRACTOR MAY UTILIZE DIRECTIONAL-BORE METHODS UNDER SIDEWALKS AND FLOOR SLABS OR OPEN CUT TRENCHING.
 - CONTRACTOR IS REQUIRED TO PATCH OR REPLACE SIDEWALKS AND FLOOR SLABS AS NEEDED TO MATCH EXISTING CONDITIONS.
 - CONTRACTOR MAY BE REQUIRED TO PENETRATE FOOTING AT EXTERIOR WALL AND INFILL PENETRATION WITH NON-SHRINK GROUT.
 - CONCRETE DUCTBANK IS NOT REQUIRED BELOW CONCRETE SLABS WITHIN BUILDING INTERIOR.
 - PROVIDE DATA CABLES FROM COMMUNICATIONS ROOM TO PV SYSTEM INVERTERS AS REQUIRED AND AS RECOMMENDED BY PV SYSTEM MANUFACTURER.
- CONTRACTOR SHALL PUSH (3) 3" RMC CONDUIT SLEEVES APPROXIMATELY 28" BELOW SIDEWALK FOR ROUTING OF PV SYSTEM CONDUITS. CONTRACTOR SHALL TAKE EVERY PRECAUTION SO AS NOT TO DAMAGE FINISH OF SIDEWALK.
- PV SYSTEM KILL SWITCH (RED MUSHROOM HEAD PUSH-BUTTON) LOCATED IN ELECTRICAL ROOM 1090, ALONGSIDE GENERATOR KILL SWITCH. KILL SWITCH SHALL HAVE IDENTIFICATION NAMEPLATE "PHOTOVOLTAIC KILL SWITCH", AND ACTIVATE SHUNT-TRIP DEVICE OF PV SYSTEM CIRCUIT BREAKER.



2 DUCTBANK DETAIL

NOT TO SCALE



3 HANDHOLE DETAIL

NOT TO SCALE

DESCRIPTION OF DEDUCTIVE BID ITEMS (DBI's):

- DBI #2 DELETE 50% OF THE PHOTOVOLTAIC (PV) SYSTEM, GENERALLY DESCRIBED AS FOLLOWS:
- REDUCE QUANTITY OF SOLAR PANELS FROM 288 TO 144 (6 ROWS OF 24).
 - REDUCE QUANTITY OF 36KW STRING INVERTERS FROM TWO (2) TO ONE (1).
 - REDUCE QUANTITY OF 100A FUSED DISCONNECTS WITH 80A FUSES FROM TWO (2) TO ONE (1).
 - REDUCE SIZE OF PV SYSTEM SHUNT-TRIP CIRCUIT BREAKER FROM 150A TO 80A.
 - REDUCE FEEDER SIZE FROM 4#3/0, 1#6G, 2" C TO 4#2, 1#6G, 2" C.
- DBI #3 DELETE THE REMAINING 50% OF THE PHOTOVOLTAIC (PV) SYSTEM FOR A COMPLETE DELETION OF THE PV SYSTEM.



1 PHOTOVOLTAIC SYSTEM SITE PLAN

1"=50'

0 25' 50' 100'
Scale: 1" = 50'



1250 N. PONTIAC TRAIL, WALLE LAKE, MI 48390
WESTMEIER, HOUSTON, TX 77062
8400 N. BROADWAY, OKLAHOMA CITY, OK 73114
622 EMERSON ROAD, ST. LOUIS, MO 63141
60 PLATO BOULEVARD E. ST. PAUL, MN 55107
ONE WEST THIRD STREET, TULSA, OK 74103



THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION
EXPIRATION DATE OF LICENSE: 04/30/2022

SYN	DESCRIPTION	DATE	APPR	MCB
1	ADDENDUM NO. 1	6/2/2020		

SUBMITAL PHASE
100% FINAL BID SET

SUBMITAL DATE: 03/17/2020

DES: WJB DRW: WJB CHK: DWM

DEPARTMENT OF DEFENSE
FACILITIES DESIGN & PROJECTS BRANCH
KALAELOA, KAPOLEI, OAHU, HAWAII

STATE OF HAWAII
FACILITY MANAGEMENT OFFICE
91-1387 SARATOGA AVENUE
BUILDING 29 PARKING, PHOTOVOLTAIC SYSTEM, SITE IMPROVEMENTS
AND MISCELLANEOUS EXTERNAL AND INTERNAL IMPROVEMENTS

HAWAII ARMY NATIONAL GUARD

BASE BID DBI #2, 3 PHOTOVOLTAIC SYSTEM SITE PLAN

ELECTRICAL

TMK NO. 9-1-013-045

SCALE: AS NOTED

STATE JOB NO. CA-1512-C

FEDERAL PROJECT NO. 15150023

SHEET OF

E.102

D

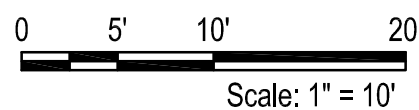
C

B

A



1 PHOTOVOLTAIC SYSTEM ENLARGED PLAN
1"=10'



CONC. PAV'L

UE

SS

16"W

COMM

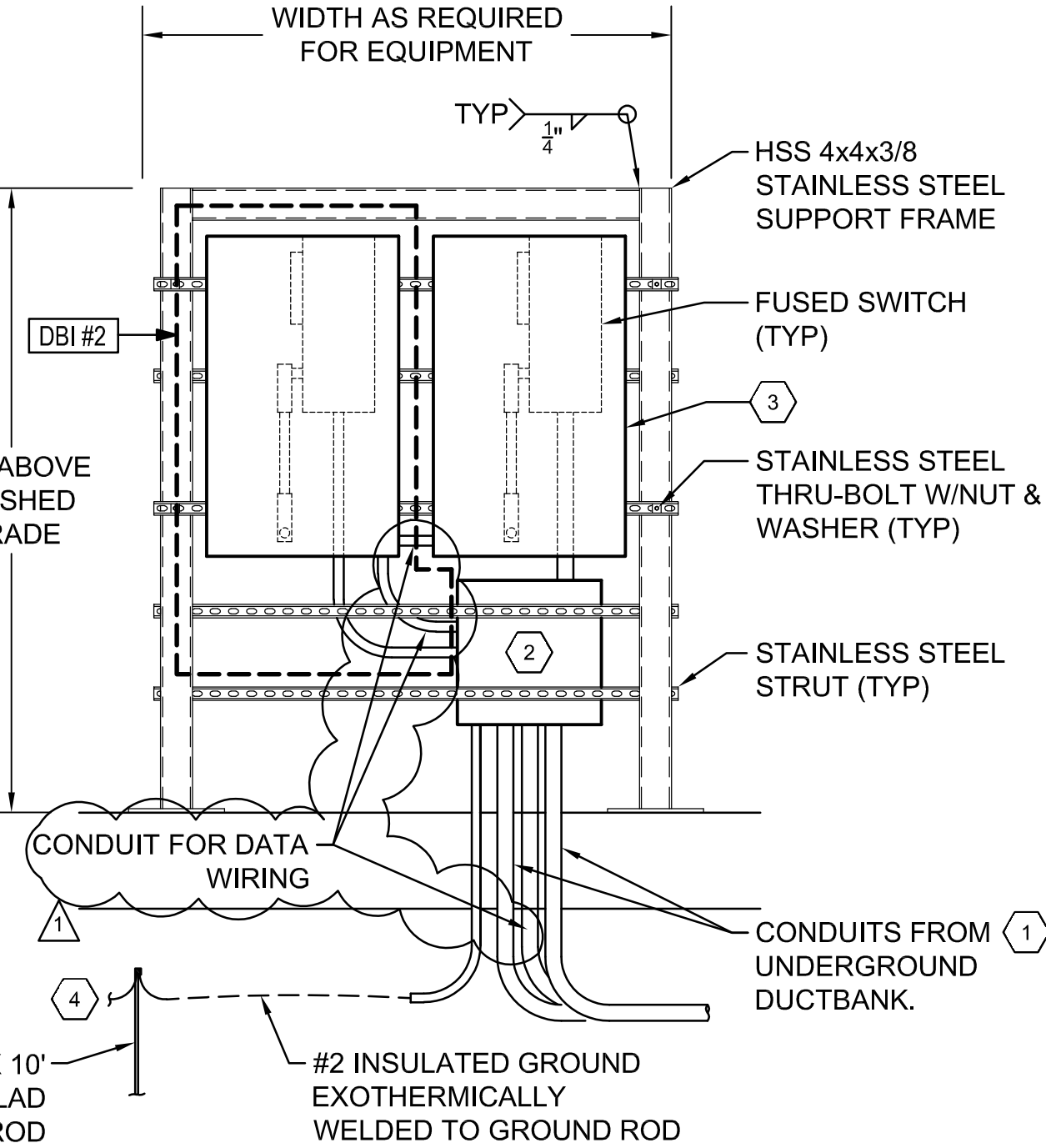
SS

-1

CONC. PAV'L

2

2



2 PV INVERTER SUPPORT FRAME DETAIL
SCALE: NOT TO SCALE

SHEET NOTES:

1. UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORDS. THEREFORE, THEIR LOCATION MUST BE CONSIDERED APPROXIMATE ONLY. THERE MAY BE OTHERS, THE EXISTENCE OF WHICH IS NOT PRESENTLY KNOWN. BEFORE STARTING ANY WORK, LOCATE AND PROTECT ALL EXISTING BURIED UTILITY LINES, WHETHER OR NOT SHOWN ON THESE DRAWINGS, DURING THE COURSE OF CONSTRUCTION.
2. REFER TO ONE-LINE DIAGRAM, SHEET E.601 FOR FEEDER SIZES.

KEYED NOTES:

1. TRANSITION FROM PVC TO RIGID GALVANIZED STEEL BEFORE STUB-UP AT JUNCTION BOX.
2. PROVIDE 18"x18"x6" STAINLESS STEEL JUNCTION BOX FOR FEEDER TAP.
3. PROVIDE (2)36kW, 3 PHASE, TRANSFORMERLESS STRING INVERTERS. INVERTERS SHALL HAVE 1000VDC MAXIMUM OPEN CIRCUIT VOLTAGE, MINIMUM OF 10 FUSED STRING POSITIONS, 480VAC 3-PH OUTPUT VOLTAGE, AND MINIMUM 10 YEAR WARRANTY. INVERTERS SHALL BE CAPABLE OF CONNECTING 50.4kW OF SOLAR PANELS WITHOUT RISK OF DAMAGE. INVERTERS SHALL BE FURNISHED WITH WEB BASED EXTERNAL DATA LOGGER AND MONITORING SUBSCRIPTION.
4. EXOTHERMICALLY WELD GROUND CONDUCTOR TO COLUMN.
5. PROVIDE 288 (6 ROWS OF 48) 72 CELL, SOLAR PANELS WITH 350W OUTPUT EACH (39.4" WIDE BY 78.46" LONG), FOR A TOTAL OF 100.8kW CONNECTED. SOLAR PANELS SHALL HAVE A MINIMUM 20 YEAR WARRANTY.

GENERAL NOTES:

1. THREE-PARTY SIA REQUIRED WITH HIARNG, NAVFAC AND HECO.
2. FAA AND SOH-DOT AIRPORTS APPROVALS REQUIRED.
3. ALL RENEWABLE SYSTEMS EQUIPMENT MUST BE LISTED ON HECO APPROVED MANUFACTURER MATERIALS LISTING.

DBI #2 & DBI #3:
REFER TO DRAWING E.102
FOR DESCRIPTION OF DBI #2
& DBI #3.



1220 N. PONTIAC TRAIL, WILLED LAKE, MI 48390
WEST THUNDER, HOUSTON, TX 77041
3400 N. BROADWAY, OKLAHOMA CITY, OK 73114
825 EMERSON ROAD, ST. LOUIS, MO 63141
60 PLATO BOULEVARD E. ST. PAUL, MN 55107
ONE WEST THIRD STREET, TULSA, OK 74103



THIS WORK WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION. EXPIRATION DATE OF LICENSE: 06/05/2022

NO.	DATE	SYN	DESCRIPTION
1	6/2/2020	MCB	APPR
ADDENDUM NO. 1			

SUBMITAL PHASE
100% FINAL BID SET

SUBMITAL DATE: 03/17/2020
DES: WJB GRW: WJB CHK: DWM

STATE OF HAWAII FACILITY MANAGEMENT OFFICE HAWAII ARMY NATIONAL GUARD FACILITIES DESIGN & PROJECTS BRANCH KALAELOA, KAPOLEI, OAHU, HAWAII 91-1387 SARATOGA AVENUE BUILDING 29 PARKING, PHOTOVOLTAIC SYSTEM, SITE IMPROVEMENTS AND MISCELLANEOUS EXTERNAL AND INTERNAL IMPROVEMENTS ELECTRICAL BASE BID DBI #2, 3 ENLARGED PLAN	T.M.K. NO. 9-1-013, 045
--	----------------------------

SCALE:	AS NOTED
STATE JOB NO.	CA-1512-C
FEDERAL PROJECT NO.	15150023
SHEET	OF
E.401	