

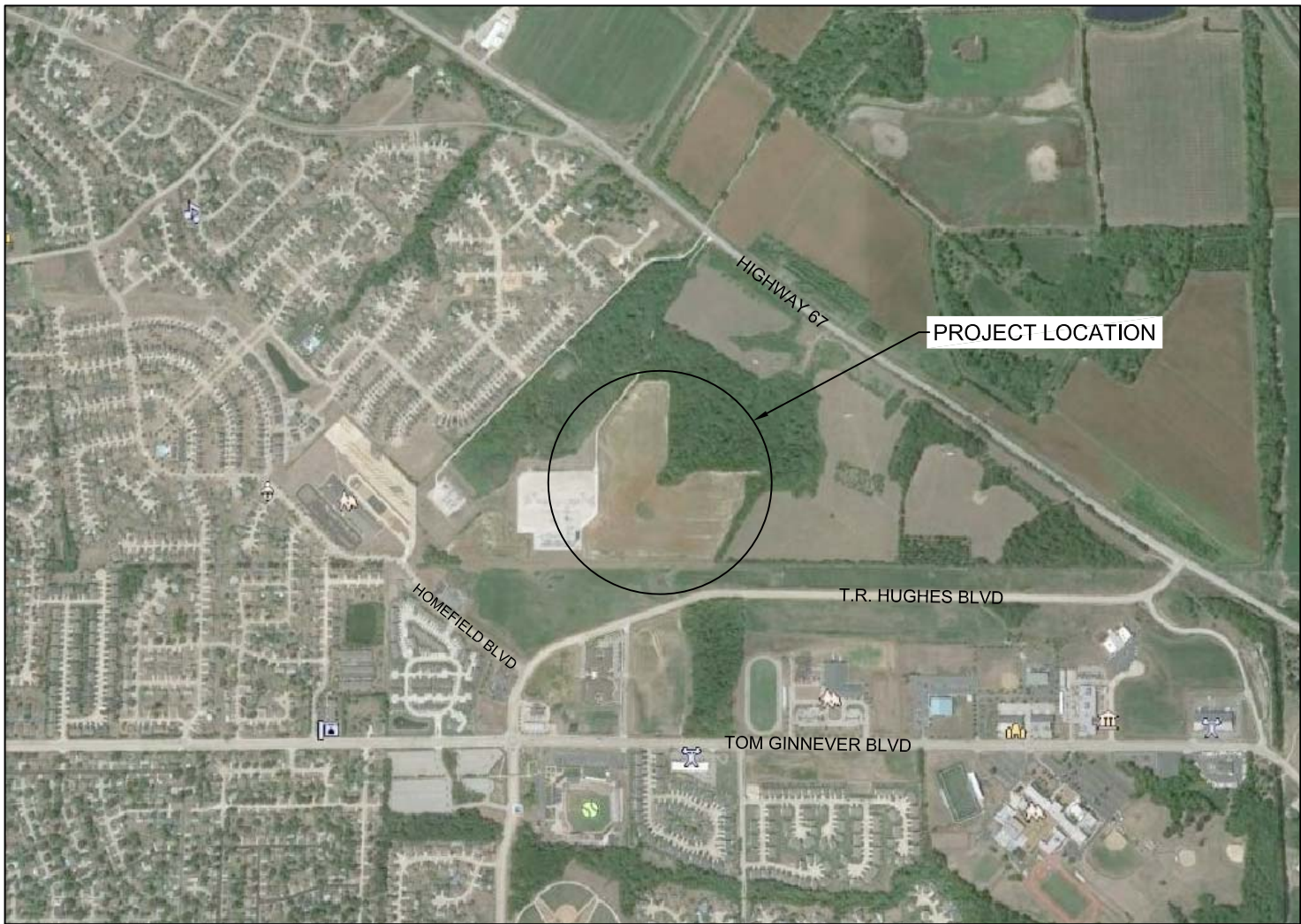
AMEREN COG SOLAR PROJECT

5.7 MW DC (4.5 MW AC) PV POWER PLANT

CITY OF O'FALLON, MISSOURI

INDEX OF SHEETS

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S1	BOUNDARY SURVEY
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EP010	ELECTRICAL DETAILS
SF100	STRUCTURAL FOUNDATIONS
CP001	CIVIL GRADING PLAN
CP010	CIVIL DETAILS



LOCATION MAP



PRELIMINARY - NOT FOR CONSTRUCTION
JANUARY 3, 2014

no.	date	by	ckd	description
A	01/03/14	CAH	-	ISSUED FOR REVIEW



425 SOUTH WOODS MILL ROAD
CHESTERFIELD, MO
314-682-1500

SURVEY DATA:
SURVEY DATE: AUGUST 2013
13 FIELD CREW: BCS, KEA
FIELD BOOK: NA
CLIENT:
AMEREN
ST. LOUIS, MO 63101
PHONE: (314) 957-3336

BOUNDARY SURVEY
AMEREN SOLAR ENERGY PROPERTY
O'FALLON, MISSOURI

Kuhlmann design Group, Inc.
66 Progress Parkway
St. Louis, Missouri 63043-3706
Tel: 314.434.8898 Fax: 314.434.8280
St. Louis, MO • Belleville, IL

KdG

CHRISTINE M. BEASLEY
NUMBER
PLS-2002014096

NO.	DATE

PROJECT NO. 130070 CONTRACT NO. 0001
DRAWN: JPB/CMB CHECKED: CMB
DATE: DECEMBER 2013

BOUNDARY SURVEY
SHEET 1 OF 1

BOUNDARY SURVEY

A TRACT OF LAND BEING PART OF FRACTIONAL SECTION 15 AND 22
AND US SURVEY 3070
TOWNSHIP 47 NORTH, RANGE 3 EAST
ST. CHARLES COUNTY, MISSOURI

LEGAL DESCRIPTION (SOUTH PROPERTY)

A TRACT OF LAND BEING PART OF FRACTIONAL SECTIONS 22 AND U.S. SURVEY 3070, TOWNSHIP 47 NORTH, RANGE 3 EAST, ST. CHARLES COUNTY, MISSOURI AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A STONE LOCATED AT THE NORTH-EAST CORNER OF LAKESIDE MANOR AS RECORDED IN PLAT BOOK 33, PAGES 216 AND 217 OF THE ST. CHARLES COUNTY MISSOURI RECORDS; THENCE ALONG THE LINE COMMON TO SECTIONS 15 AND 21, SOUTH 88 DEGREES 48 MINUTES 48 SECONDS EAST, A DISTANCE OF 1,351.64 FEET TO A STONE LOCATED AT THE CORNER COMMON TO SECTIONS 15, 16, 21, AND 22; THENCE ALONG THE LINE COMMON TO SECTIONS 15 AND 22, SOUTH 89 DEGREES 02 MINUTES 54 SECONDS EAST, A DISTANCE OF 193.65 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT; THENCE CONTINUING ALONG THE LINE COMMON TO SECTIONS 15 AND 22, SOUTH 88 DEGREES 52 MINUTES 54 SECONDS EAST, A DISTANCE OF 993.85 FEET TO A STONE; THENCE LEAVING SAID COMMON LINE OF SECTIONS 15 AND 22, SOUTH 33 DEGREES 13 MINUTES 06 SECONDS EAST, A DISTANCE OF 245.42 FEET TO A POINT ON THE NORTH RIGHT OF WAY LINE OF T.R. HUGHES BOULEVARD (VARIABLE WIDTH); THENCE ALONG THE NORTH RIGHT OF WAY LINE OF T.R. HUGHES BOULEVARD (VARIABLE WIDTH) NORTH 17 DEGREES 47 MINUTES 38 SECONDS WEST, A DISTANCE OF 140.00 FEET; THENCE NORTH 89 DEGREES 02 MINUTES 47 SECONDS WEST, A DISTANCE OF 30.86 FEET; THENCE LEAVING THE NORTH RIGHT OF WAY LINE OF T.R. HUGHES BOULEVARD NORTH 89 DEGREES 02 MINUTES 54 SECONDS WEST, A DISTANCE OF 860.17 FEET; THENCE NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 200.00 FEET TO THE POINT OF BEGINNING.

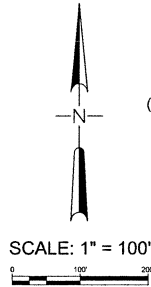
THE ABOVE PARCEL BEING SITUATED IN ST. CHARLES COUNTY, MISSOURI AND CONTAINING 212.416 SQUARE FEET, OR 4.9 ACRES, MORE OR LESS.

LEGAL DESCRIPTION (NORTH PROPERTY)

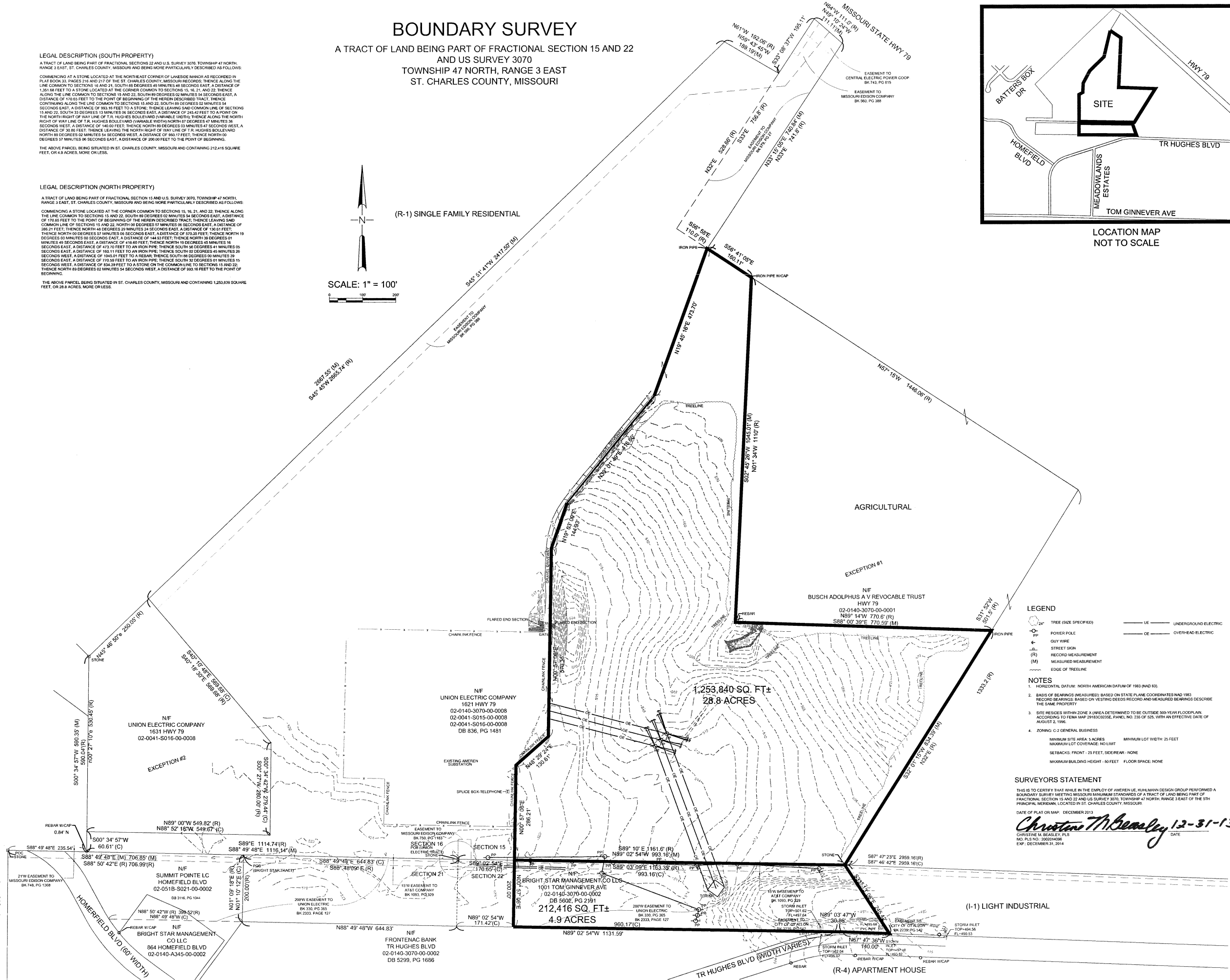
A TRACT OF LAND BEING PART OF FRACTIONAL SECTION 15 AND U.S. SURVEY 3070, TOWNSHIP 47 NORTH, RANGE 3 EAST, ST. CHARLES COUNTY, MISSOURI AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT A STONE LOCATED AT THE CORNER COMMON TO SECTIONS 15, 16, 21, AND 22; THENCE ALONG THE LINE COMMON TO SECTIONS 15 AND 22, SOUTH 88 DEGREES 02 MINUTES 54 SECONDS EAST, A DISTANCE OF 170.65 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED TRACT; THENCE LEAVING SAID COMMON LINE OF SECTIONS 15 AND 22, NORTH 00 DEGREES 00 MINUTES 00 SECONDS EAST, A DISTANCE OF 200.00 FEET; THENCE NORTH 48 DEGREES 29 MINUTES 34 SECONDS EAST, A DISTANCE OF 135.01 FEET; THENCE NORTH 00 DEGREES 57 MINUTES 06 SECONDS EAST, A DISTANCE OF 570.35 FEET; THENCE NORTH 19 DEGREES 03 MINUTES 00 SECONDS EAST, A DISTANCE OF 140.00 FEET; THENCE NORTH 00 DEGREES 01 MINUTES 49 SECONDS EAST, A DISTANCE OF 418.80 FEET; THENCE NORTH 19 DEGREES 45 MINUTES 16 SECONDS EAST, A DISTANCE OF 473.10 FEET TO AN IRON PIPE; THENCE SOUTH 36 DEGREES 44 MINUTES 29 SECONDS EAST, A DISTANCE OF 160.11 FEET TO AN IRON PIPE; THENCE SOUTH 02 DEGREES 45 MINUTES 29 SECONDS WEST, A DISTANCE OF 1043.01 FEET TO A REBAR; THENCE SOUTH 89 DEGREES 00 MINUTES 29 SECONDS EAST, A DISTANCE OF 770.39 FEET TO AN IRON PIPE; THENCE SOUTH 35 DEGREES 01 MINUTES 19 SECONDS WEST, A DISTANCE OF 834.39 FEET TO A STONE ON THE COMMON LINE TO SECTIONS 15 AND 22; THENCE NORTH 88 DEGREES 02 MINUTES 54 SECONDS WEST, A DISTANCE OF 993.85 FEET TO THE POINT OF BEGINNING.

THE ABOVE PARCEL BEING SITUATED IN ST. CHARLES COUNTY, MISSOURI AND CONTAINING 1,253,840 SQUARE FEET, OR 28.8 ACRES, MORE OR LESS.



(R-1) SINGLE FAMILY RESIDENTIAL



LEGEND

24"	TREE (SIZE SPECIFIED)	UE	UNDERGROUND ELECTRIC
PP	POWER POLE	OE	OVERHEAD ELECTRIC
+	GUY WIRE		
+	STREET SIGN		
(R)	RECORD MEASUREMENT		
(M)	MEASURED MEASUREMENT		
---	EDGE OF TREELINE		

NOTES

- HORIZONTAL DATUM: NORTH AMERICAN DATUM OF 1983 (NAD 83).
- BASIS OF BEARINGS (MEASURED): BASED ON STATE PLANE COORDINATES NAD 1983. RECORD BEARINGS BASED ON VESTING DEEDS RECORD AND MEASURED BEARINGS DESCRIBE THE SAME PROPERTY.
- SITE RESIDES WITHIN ZONE X (AREA DETERMINED TO BE OUTSIDE 500-YEAR FLOODPLAIN ACCORDING TO FEMA MAP 29183C0235E, PANEL NO. 235 OF 325, WITH AN EFFECTIVE DATE OF AUGUST 2, 1996).
- ZONING: C-2 GENERAL BUSINESS
MINIMUM SITE AREA: 5 ACRES
MINIMUM LOT COVERAGE: NO LIMIT
SETBACKS: FRONT - 25 FEET, SIDE/REAR - NONE
MINIMUM BUILDING HEIGHT - 50 FEET FLOOR SPACE: NONE

SURVEYORS STATEMENT

THIS IS TO CERTIFY THAT WHILE IN THE EMPLOY OF AMEREN UE, KULMANN DESIGN GROUP PERFORMED A BOUNDARY SURVEY MEETING MISSOURI MINIMUM STANDARDS OF A TRACT OF LAND BEING PART OF FRACTIONAL SECTION 15 AND 22 AND US SURVEY 3070, TOWNSHIP 47 NORTH, RANGE 3 EAST OF THE 5TH PRINCIPAL MERIDIAN, LOCATED IN ST. CHARLES COUNTY, MISSOURI.

DATE OF PLAT OR MAP: DECEMBER 2013

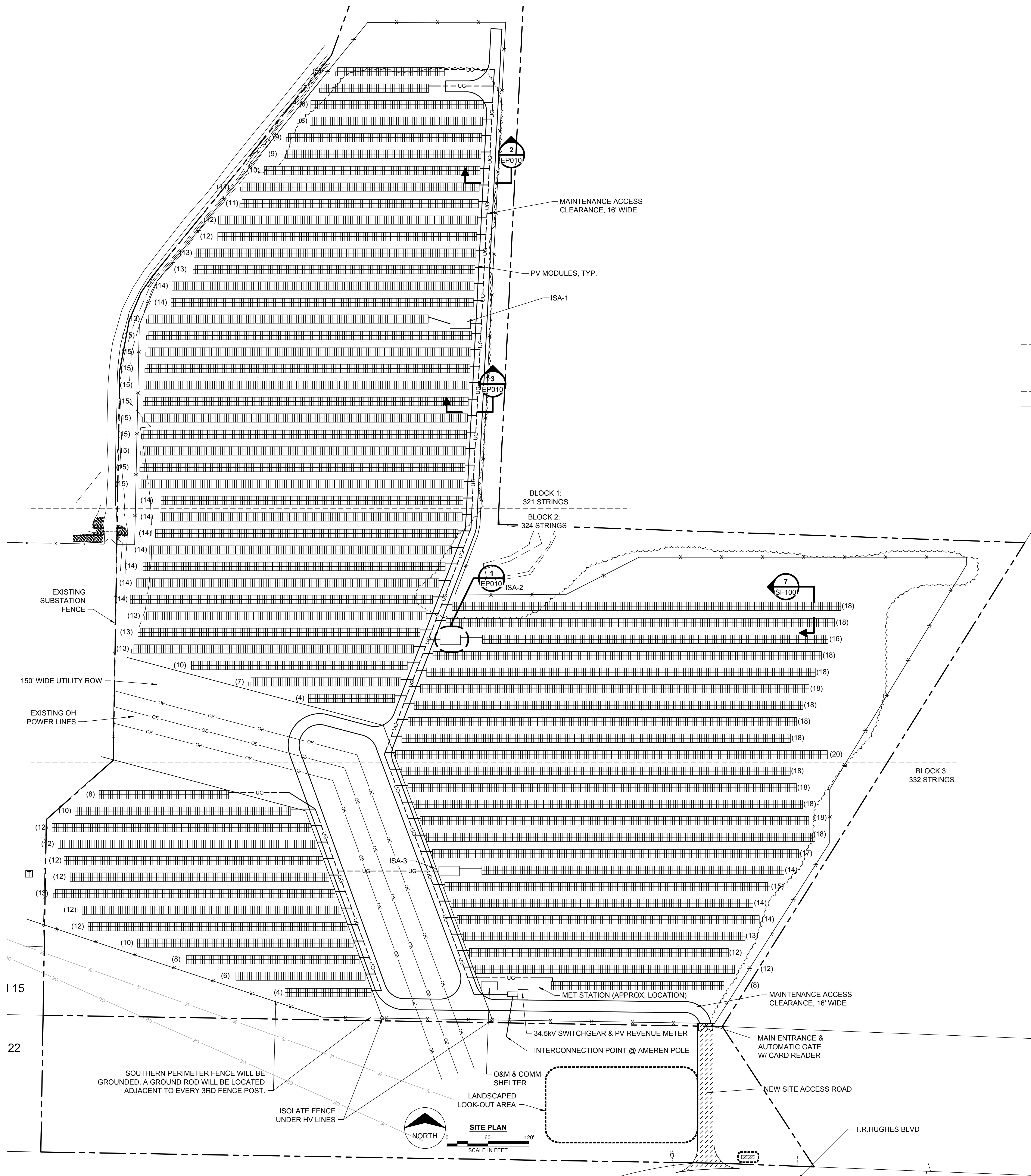
Christine M. Beasley 12-31-13
CHRISTINE M. BEASLEY, PLS
MO. PLS NO.: 2002014096
EXP.: DECEMBER 31, 2014

(I-1) LIGHT INDUSTRIAL

(R-4) APARTMENT HOUSE

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Scale for Microfilm
Inches
Millimeters



PV SYSTEM PARAMETERS:

FIXED AXIS PV ARRAYS
50% GROUND COVERAGE RATIO
24.12' ROW SPACING

SITE CAPACITY:

4.5 MWAC (SHOWN)
(3) 1.5 MWAC BLOCKS
(18,867) 305 W PV MODULES
5754.4 kW DC
19 MODULES PER STRING (993 STRINGS)
1.28 DC:AC RATIO

GENERAL NOTES:

1. THIS DRAWING REPRESENTS ONE PROPOSED ARRANGEMENT AND IS SUBJECT TO CHANGE BASED ON DETAILED DESIGN AND ACTUAL SITE CONDITIONS.
2. THE LOCATIONS OF THE ISAs, COMMUNICATIONS SHELTER, AND PV MODULES ARE TYPICAL AND MAY BE ADJUSTED DURING DETAILED DESIGN.
3. THIS DRAWING IS CONCEPTUAL IN NATURE AND IS FOR PLANNING PURPOSES ONLY.
4. EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE NEC AND ALL APPLICABLE REQUIREMENTS OF THE SERVING ELECTRIC UTILITY COMPANY AND THE LOCAL AUTHORITIES HAVING JURISDICTION.
5. THIS DRAWING DOES NOT CONSIDER LOCAL DEVELOPMENT REGULATIONS OR DRAINAGE / FLOOD CONTROL ISSUES WHICH MAY IMPACT THE PROPOSED LAYOUT.

LEGEND

- BLOCK BOUNDARY
- INVERTER SKID ASSEMBLY (ISA)
- (15) NUMBER OF STRINGS IN ROW
- UG --- UNDERGROUND CABLES (SEE SHEET EP010)
- OE --- OVERHEAD CABLES

**PRELIMINARY - NOT
FOR CONSTRUCTION**

no.	date	by	ckd	description
A	09/04/13	MJG	-	ISSUED FOR REVIEW
B	09/06/13	MJG	-	ISSUED FOR REVIEW
C	09/11/13	MJG	-	ISSUED FOR REVIEW
D	09/11/13	MJG	-	ISSUED FOR PROPOSAL
E	09/16/13	MJG	-	ISSUED FOR PROPOSAL
F	11/21/13	MJG	BSC	PROPOSAL UPDATE
G	12/30/13	MJG	KFE	ADDED SECTION REF. UPDATED LEGEND
H	12/31/13	MJG	BSC	ISSUED FOR REVIEW
J	01/03/14	MJG	-	BOUNDARY UPDATE



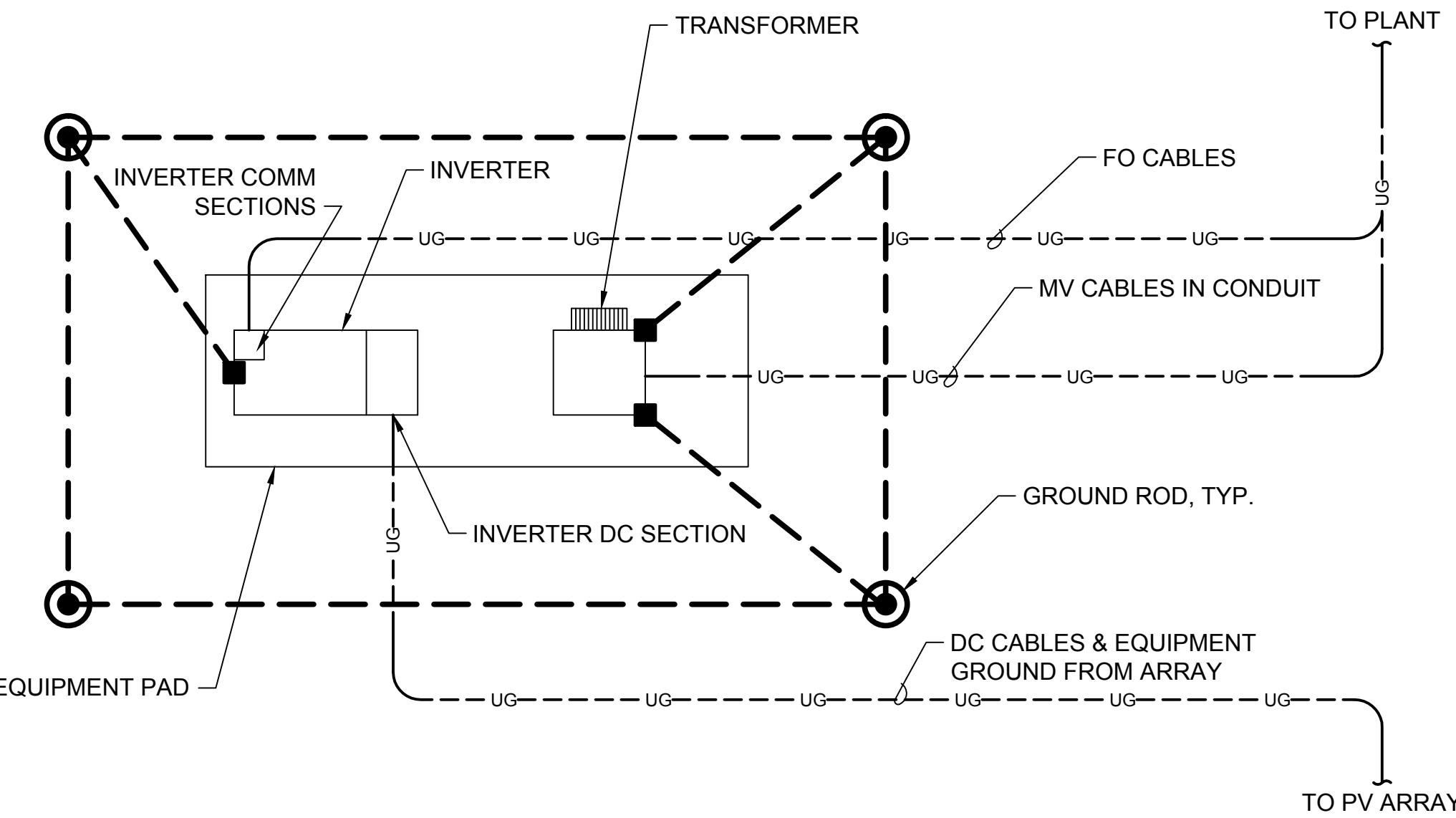
2600 N CENTRAL AVE
PHOENIX, AZ 85004
602-977-2623

date 19 DECEMBER 2013	detailed M.GONZALEZ
designed M.GONZALEZ	checked K.EKSTROM

AMEREN COG SOLAR PROJECT
5.7 MWDC (4.5 MWAC) PV POWER PLANT
ELECTRICAL PLAN

project 2270	contract 5.04.001
drawing EP001	rev. J
sheet	of sheets
file	MRKTGEP001.DWG

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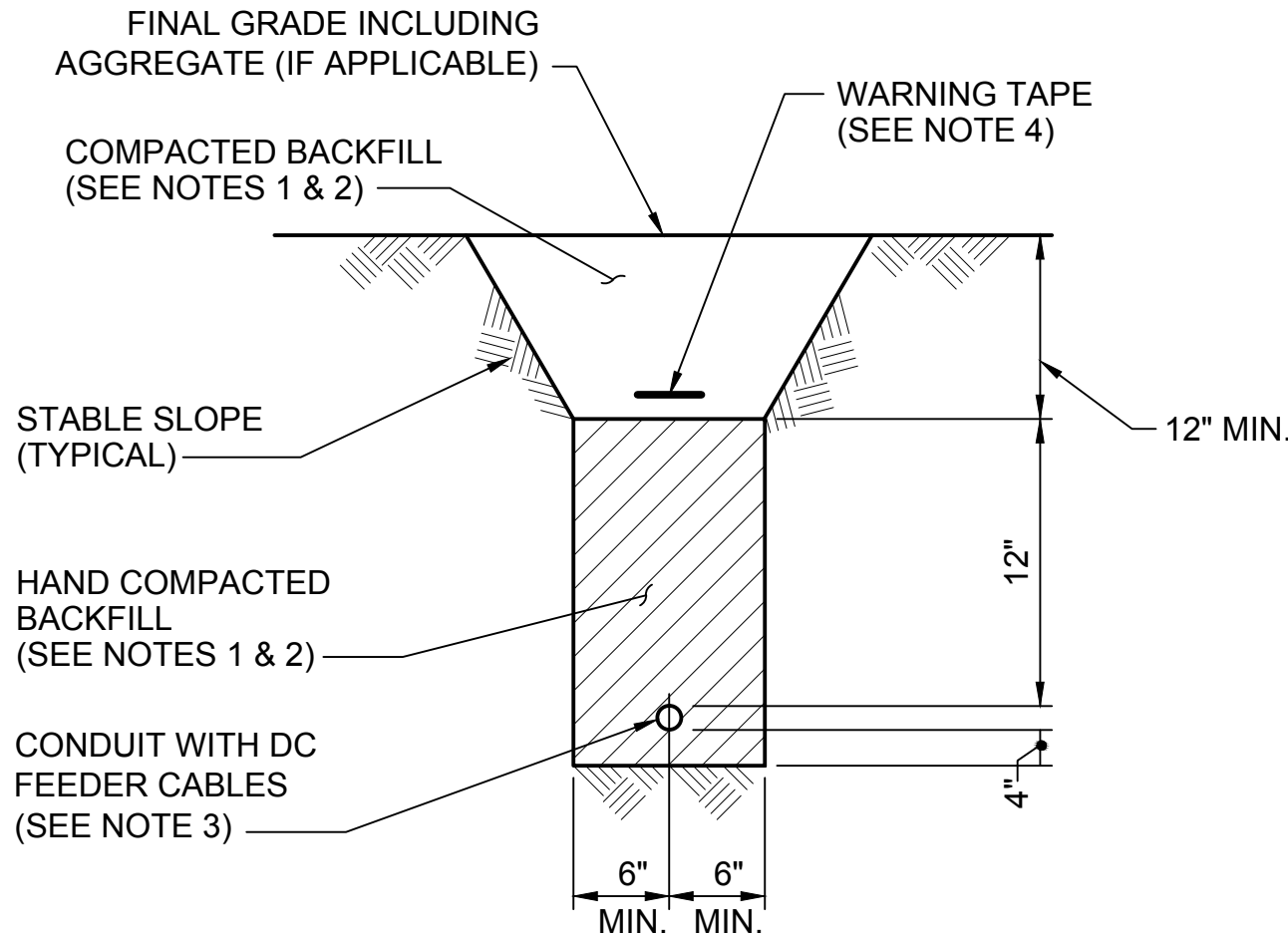
EQUIPMENT PAD DETAIL
NOT TO SCALE

GROUNDING NOTES:

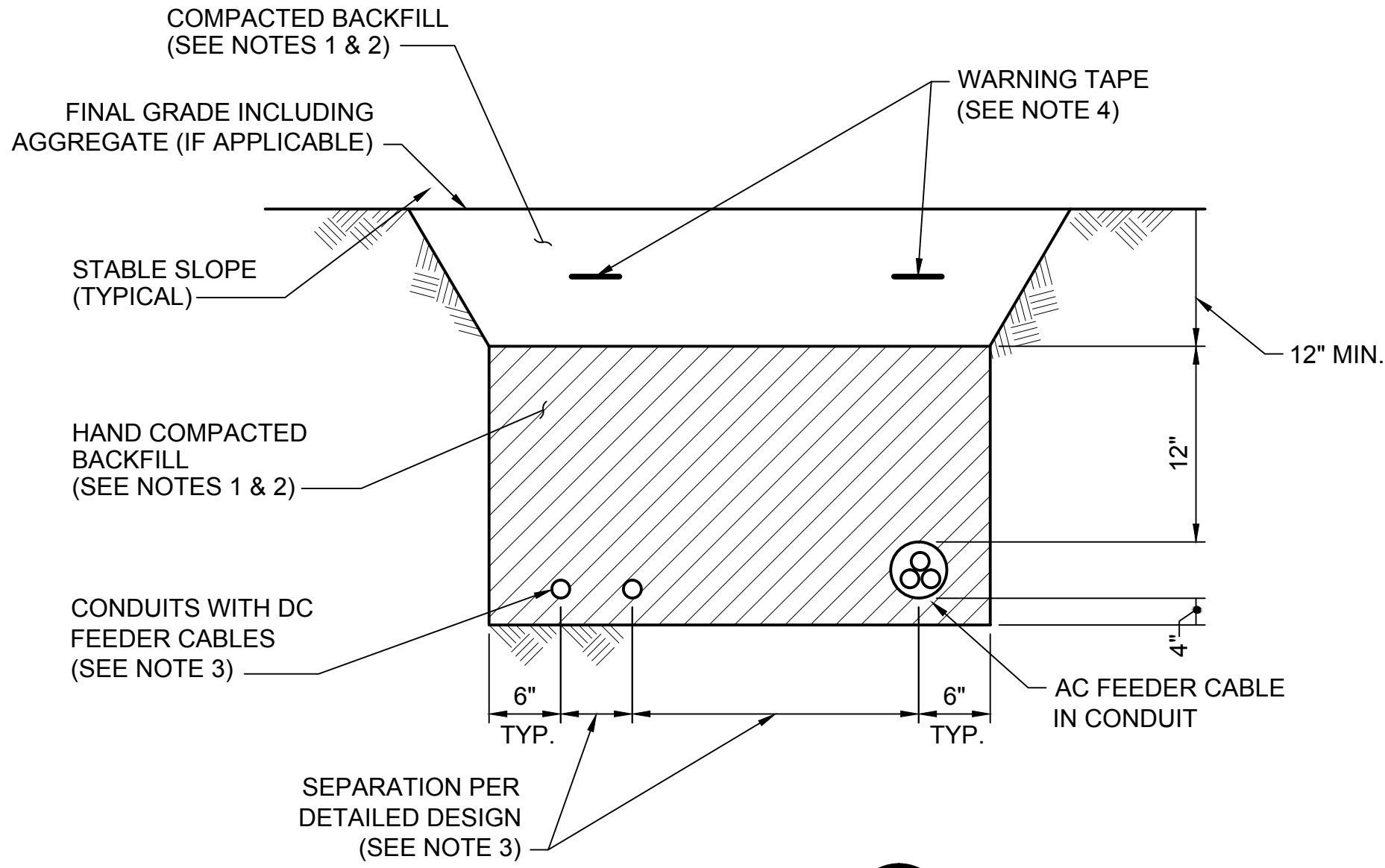
- BOND PV MODULES TO RACK WITH WEEB CLIP OR EQUIVALENT.
- BOND EACH RACK TO ADJACENT RACK WITH #10 AWG BARE CU EQUIPMENT GROUNDING CONDUCTOR (EGC) AND ILSCO GBL4-DBT OR EQUIVALENT TIN PLATED COPPER LAY IN LUG.
- TERMINATE #10 AWG EGC IN COMBINER BOX AT END OF EACH ROW OF RACKS.
- RUN #2 AWG AL EGC FROM COMBINER BOXES TO INVERTER WITH FEEDER CIRCUITS IN CONDUIT.

LEGEND

- UG--- UNDERGROUND CABLES
- GROUNDING ELECTRODE CONDUCTOR
- ⊙ GROUND ROD



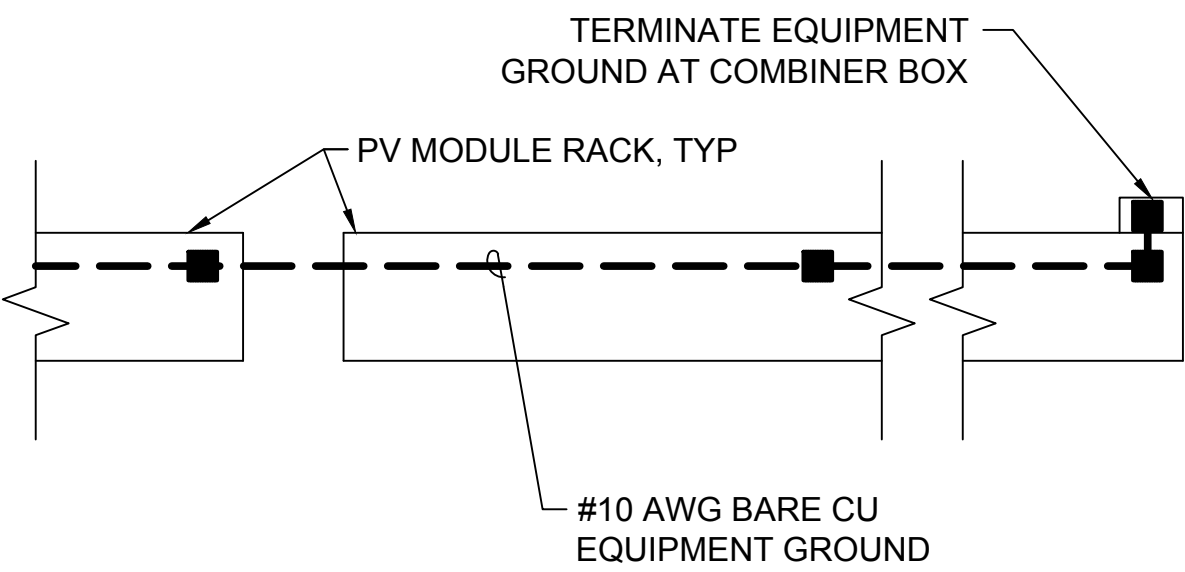
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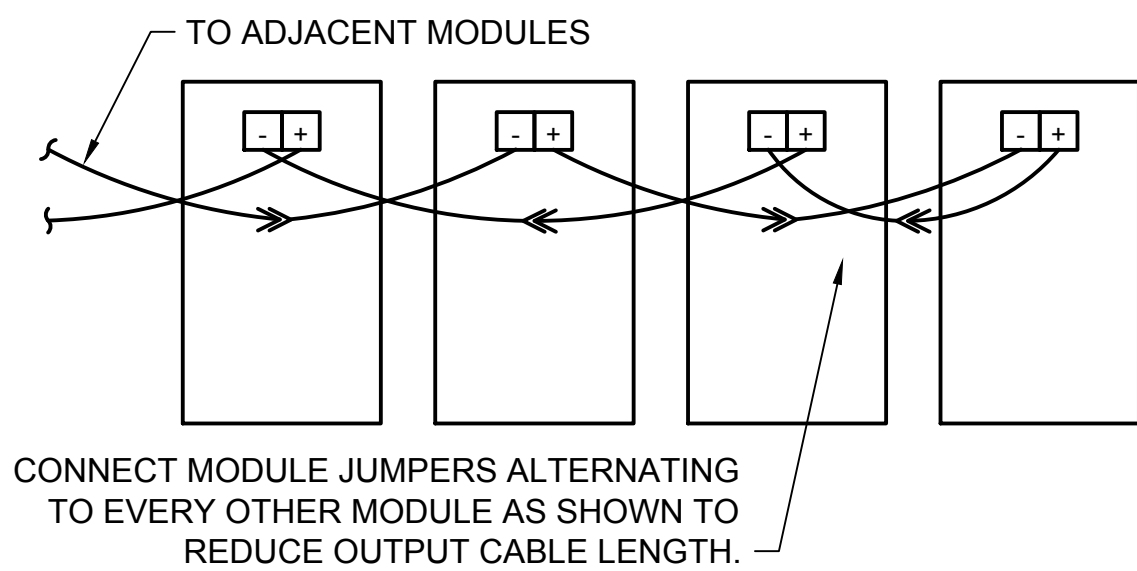
TRENCH SECTION
NOT TO SCALE

TRENCHING NOTES:

- BACKFILL-
 - OBTAIN BACKFILL MATERIALS FROM TRENCHES AND OTHER EXCAVATION IN THIS CONTRACT AND/OR FROM THE ON SITE BORROW AREAS AS DESIGNATED BY THE RESIDENT PROJECT REPRESENTATIVE.
 - BACKFILL MATERIALS INCLUDE MATERIAL THAT IS FREE OF DEBRIS, ROOTS, ORGANIC MATTER, REFUSE, CINDERS, FROZEN MATTER AND ALSO FREE OF ROCK WITH A DIMENSION GREATER THAN 2 INCHES.
- COMPACTION-
 - PLACE BACKFILL MATERIAL IN LEVEL LAYERS NOT EXCEEDING 4 TO 8 INCHES.
 - USE HAND METHODS TO A HORIZONTAL PLANE 12 INCHES ABOVE TOP OF CONDUIT.
 - USE APPROVED MECHANICAL METHODS WHERE HAND BACKFILL IS NOT REQUIRED.
 - FOR BACKFILL COMPACTION AND MOISTURE CONTENT REQUIREMENTS, SEE SITE WORK PREPARATION AND EARTHWORK SPECIFICATIONS.
- DETAIL ALSO APPLIES TO MULTIPLE CONDUIT INSTALLATION AND DIRECT BURIED CABLE. MAINTAIN CONSISTENT SPACING BETWEEN PARALLEL ADJACENT CABLES AND CONDUITS. MULTIPLE TRENCHES MAY BE USED WHERE APPLICABLE. EXCEPTIONS SHALL BE APPROVED BY PROJECT ENGINEER.
- PROVIDE METALLIC WARNING TAPE ABOVE BURIED CONDUIT AND DIRECT BURIED CABLE AS A CAUTIONARY MARKING.



PV ARRAY GROUNDING DETAIL
NOT TO SCALE



PV MODULE WIRING DETAIL
NOT TO SCALE

PRELIMINARY - NOT
FOR CONSTRUCTION

no.	date	by	ckd	description
A	08/29/13	MJG	-	ISSUED FOR REVIEW
B	08/30/13	MJG	-	ISSUED FOR REVIEW
C	09/11/13	MJG	BSC	ISSUED FOR PROPOSAL
D	09/23/13	MJG	KFE	TRENCH DETAIL CORRECTION



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602-977-2623

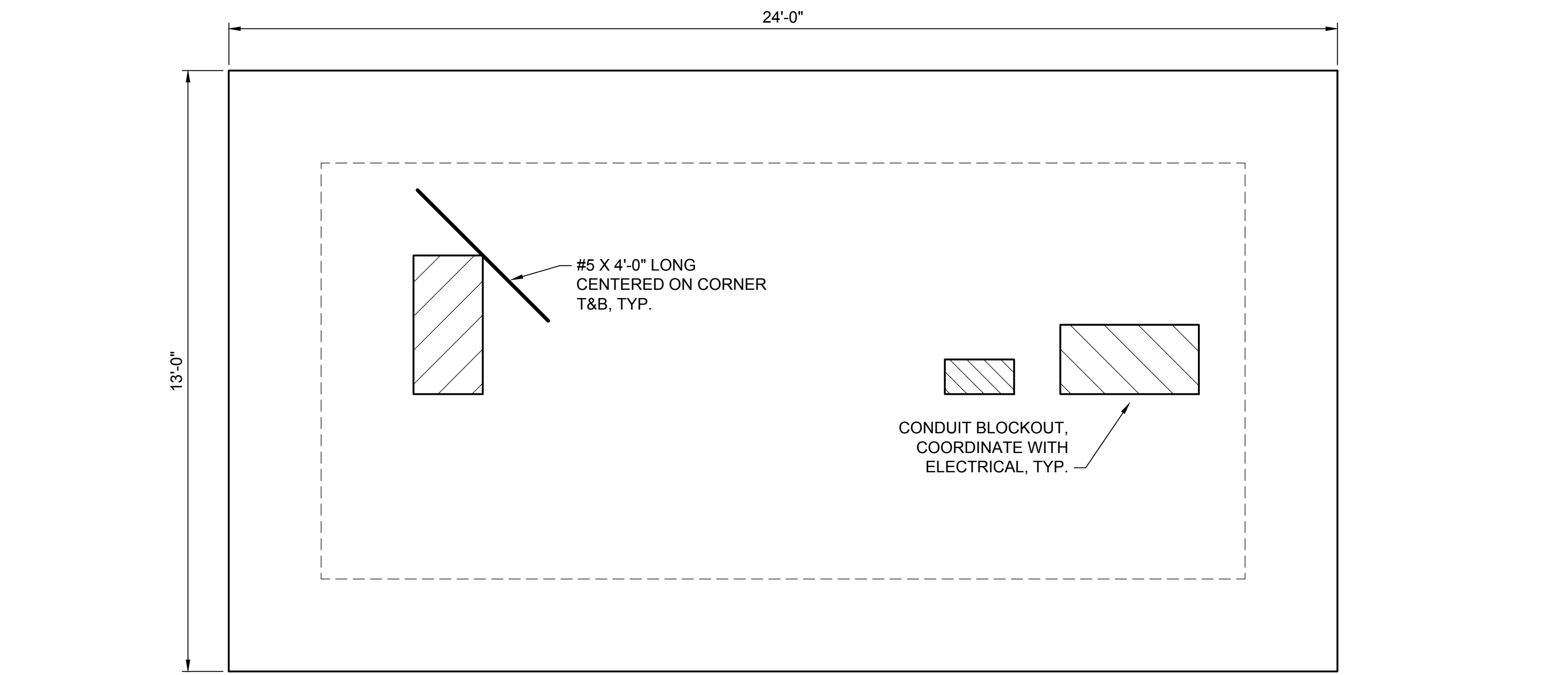
date 19 DECEMBER 2013	detailed M.GONZALEZ
designed M.GONZALEZ	checked K.EKSTROM

AMEREN COG SOLAR PROJECT
5.7 MWDC (4.5 MWAC) PV POWER PLANT
DETAILS

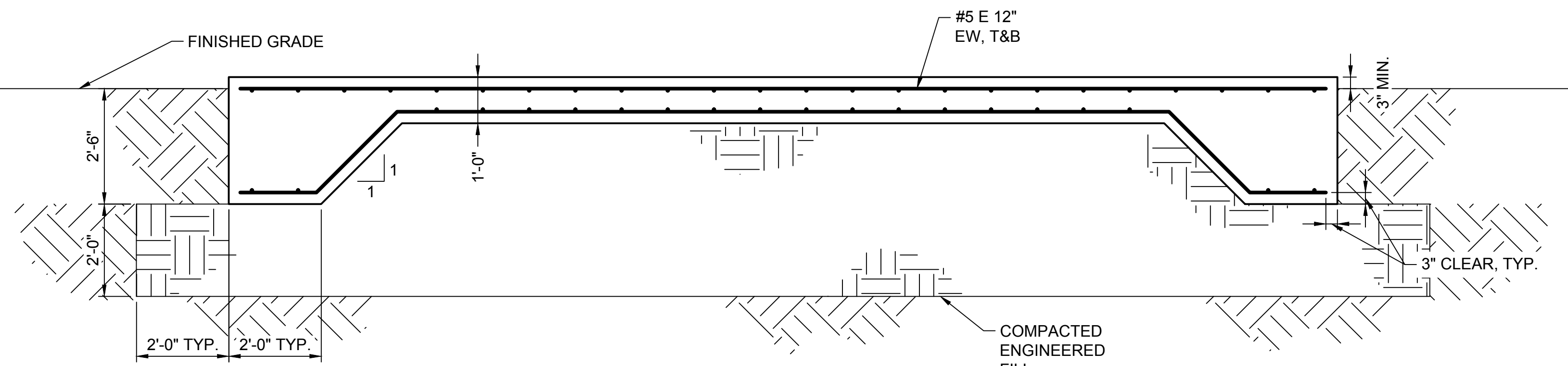
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drawing EP010	rev. D
sheet	of sheets
file	MRKTGEP010.DWG

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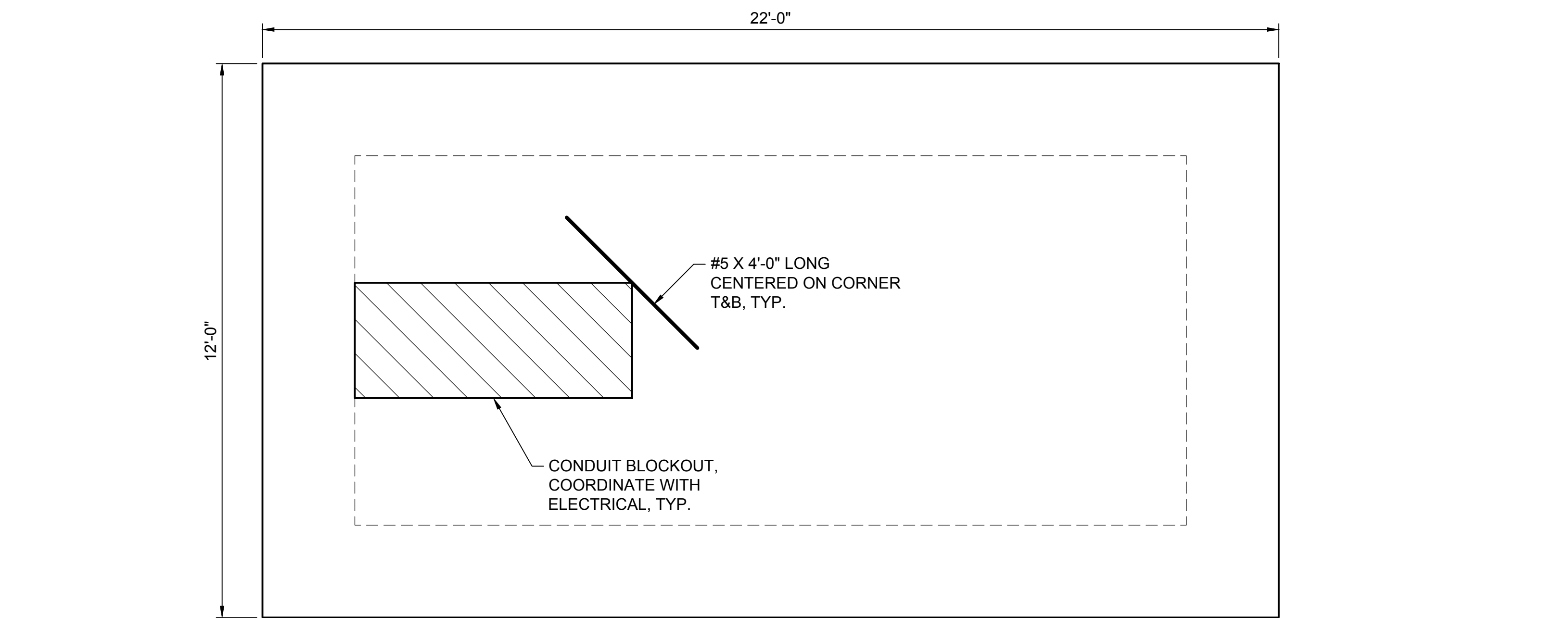
Scale For Microfitting
Inches
Millimeters



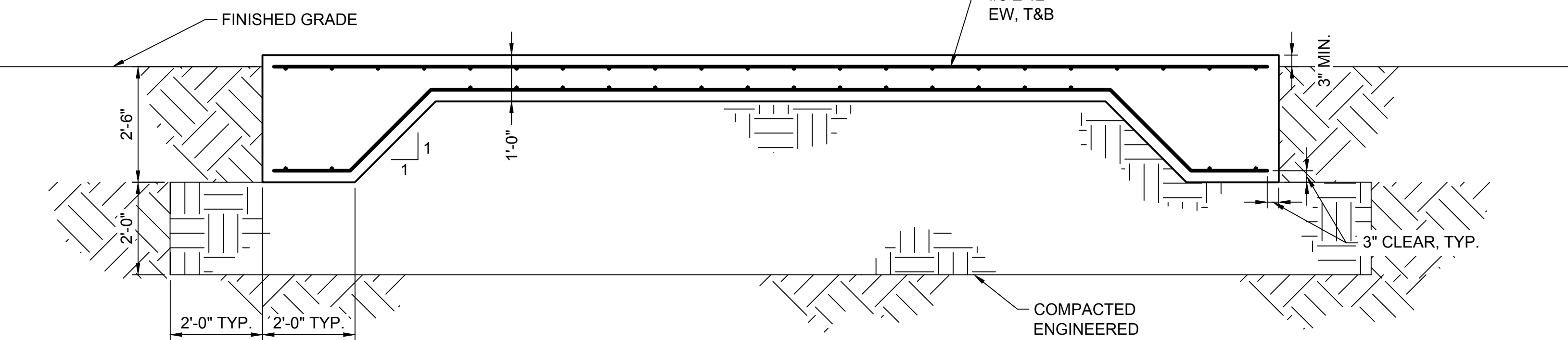
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SCALE IN FEET
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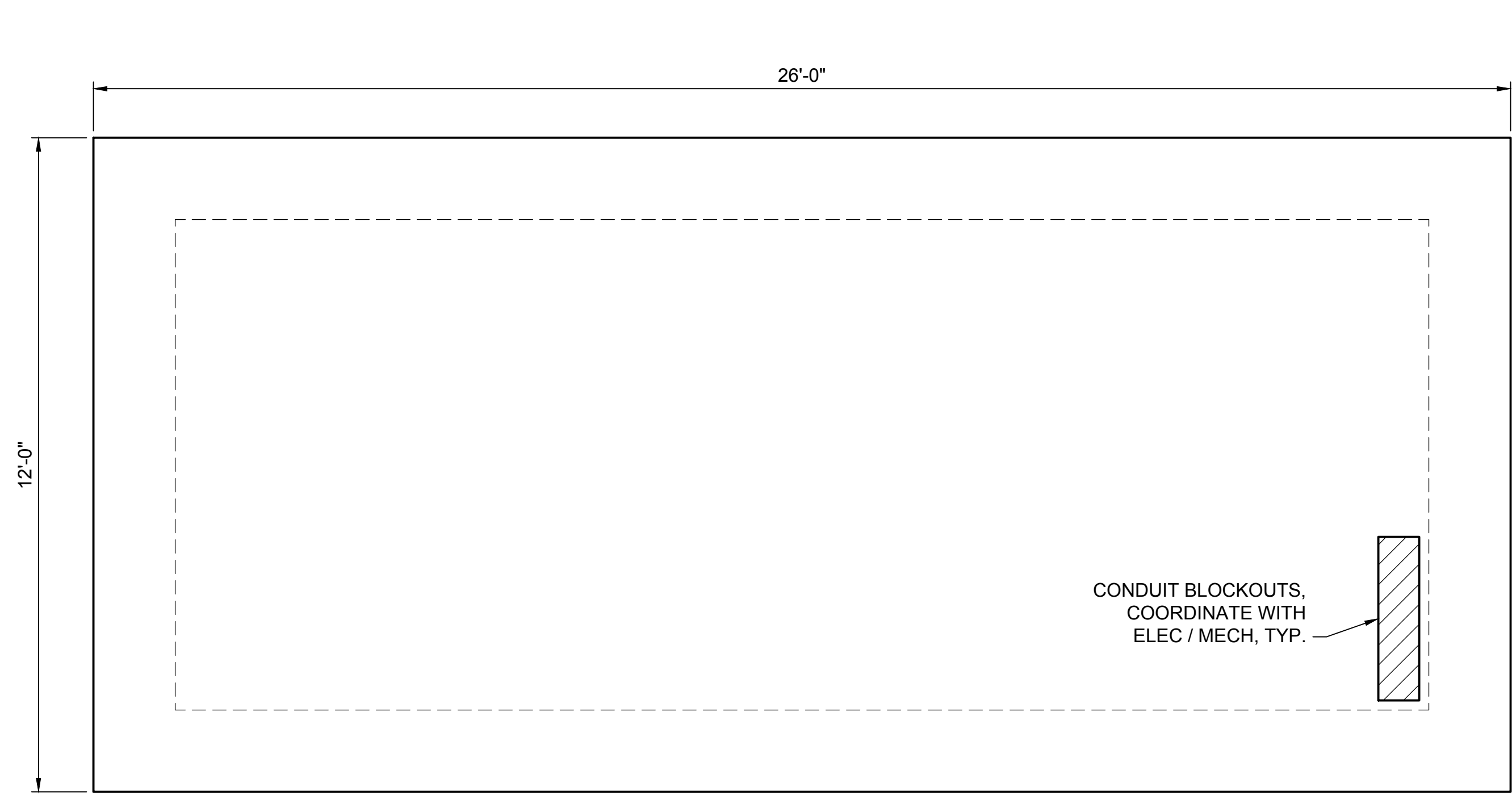
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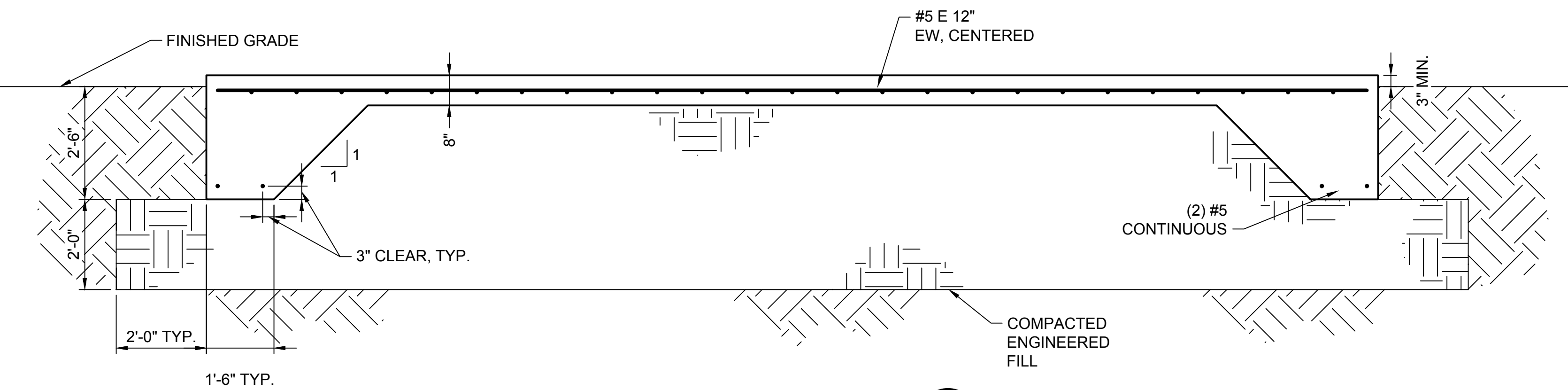
SWITCHGEAR PAD PLAN
SCALE IN FEET
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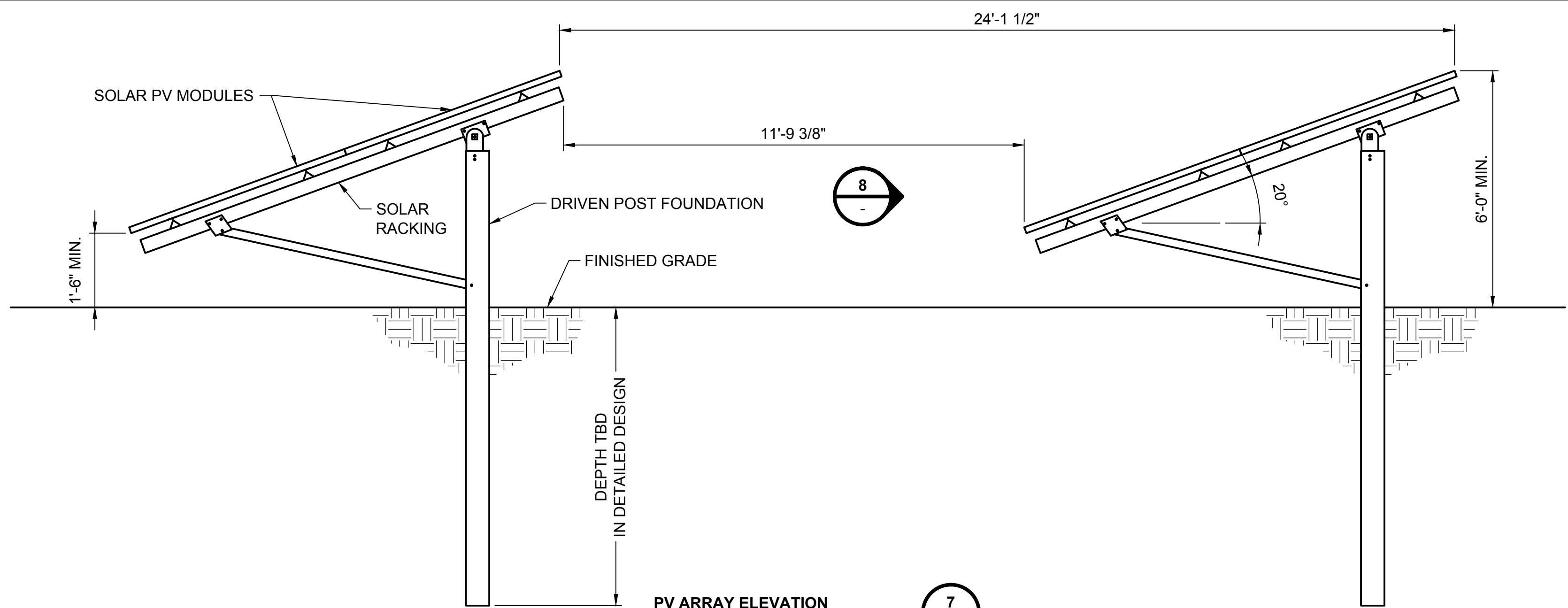
SWITCHGEAR PAD SECTION
SCALE IN FEET
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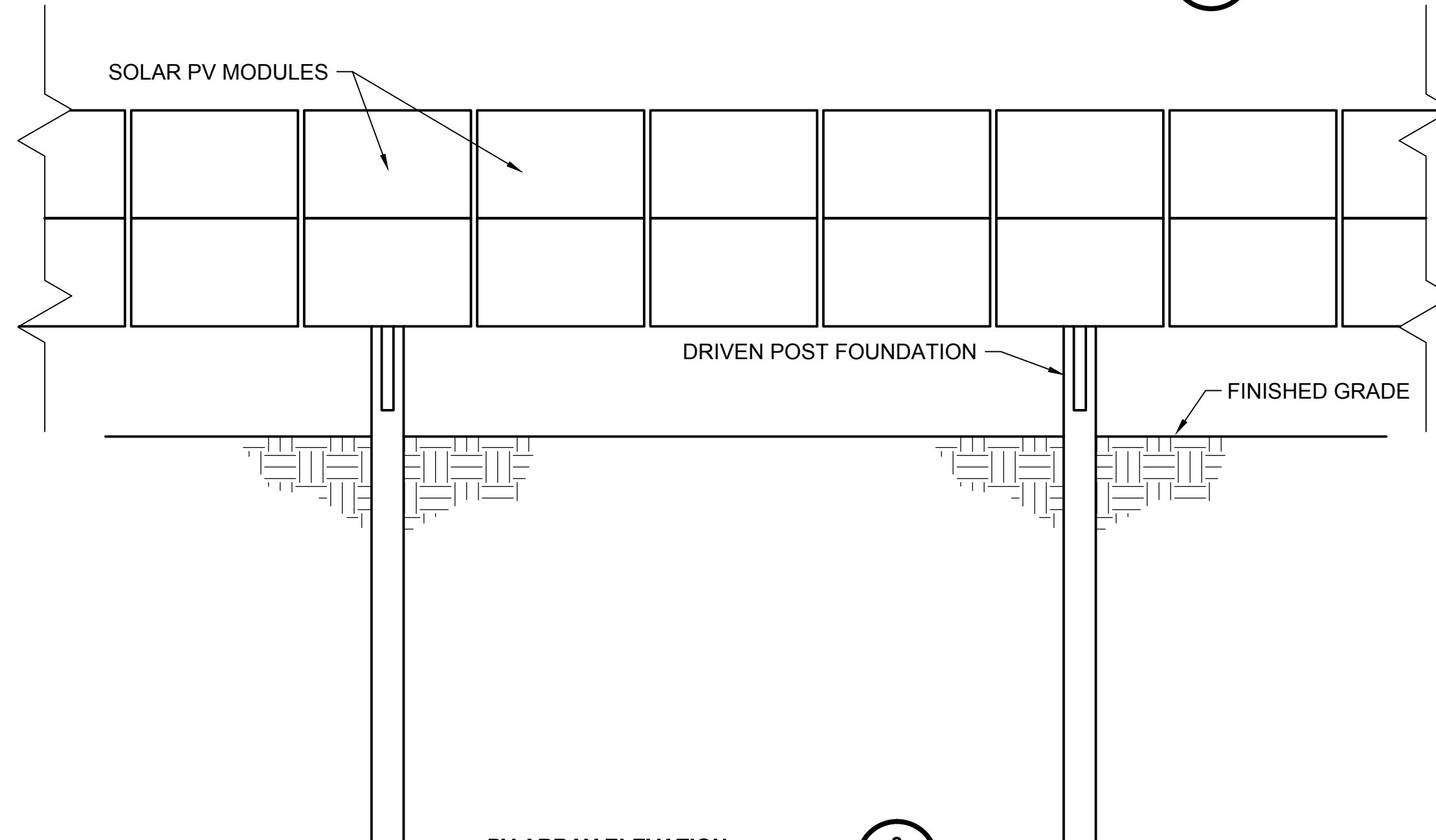
O&M BUILDING PAD PLAN
SCALE IN FEET
0 1' 2' 4'



O&M BUILDING PAD SECTION
SCALE IN FEET
0 1' 2' 4'



PV ARRAY ELEVATION
NOT TO SCALE
8



PV ARRAY ELEVATION
NOT TO SCALE
8

no.	date	by	ckd	description
A	12/30/13	MJG	KFE	ISSUED FOR REVIEW
B	12/31/13	MJG	-	ISSUED FOR REVIEW
C	01/02/14	MJG	-	ISSUED FOR REVIEW

PRELIMINARY - NOT
FOR CONSTRUCTION

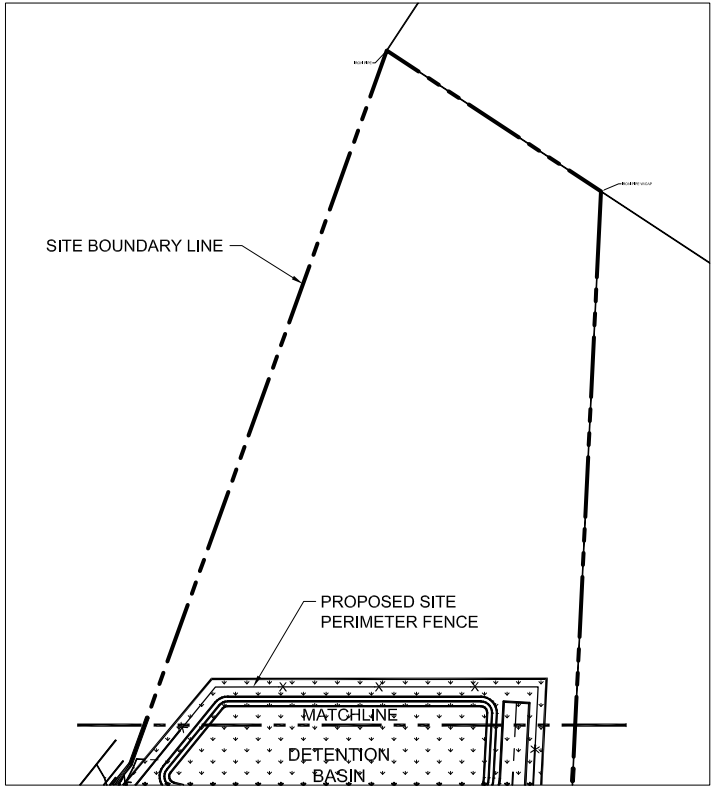
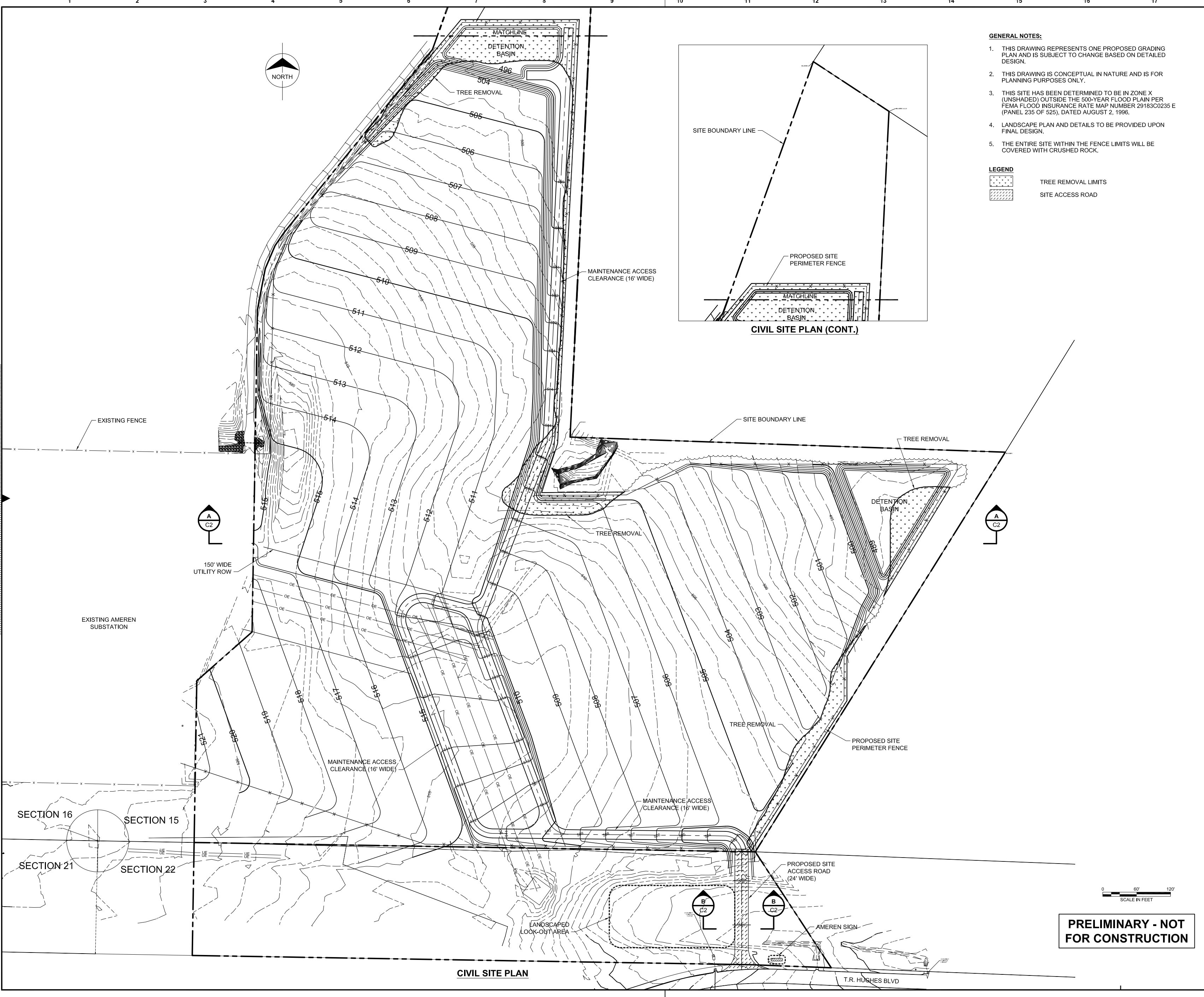


2600 N CENTRAL AVE
PHOENIX, AZ 85004
602-977-2623

date 19 DECEMBER 2013	detailed M.GONZALEZ
designed A.DAVIS	checked K.EKSTROM

AMEREN COG SOLAR PROJECT
5.7 MWDC (4.5 MWAC) PV POWER PLANT
STRUCTURAL FOUNDATIONS

project 2270	contract 5.04.001
drawing SF100	rev. C
sheet XXXXXS	of 100
file XXXXXS	sheet 100



- GENERAL NOTES:**
- THIS DRAWING REPRESENTS ONE PROPOSED GRADING PLAN AND IS SUBJECT TO CHANGE BASED ON DETAILED DESIGN.
 - THIS DRAWING IS CONCEPTUAL IN NATURE AND IS FOR PLANNING PURPOSES ONLY.
 - THIS SITE HAS BEEN DETERMINED TO BE IN ZONE X (UNSHADED) OUTSIDE THE 500-YEAR FLOOD PLAIN PER FEMA FLOOD INSURANCE RATE MAP NUMBER 29183C0235 E (PANEL 235 OF 525), DATED AUGUST 2, 1996.
 - LANDSCAPE PLAN AND DETAILS TO BE PROVIDED UPON FINAL DESIGN.
 - THE ENTIRE SITE WITHIN THE FENCE LIMITS WILL BE COVERED WITH CRUSHED ROCK.

LEGEND	
	TREE REMOVAL LIMITS
	SITE ACCESS ROAD

Schedule D		description
A	01/03/14	CAH - ISSUED FOR REVIEW

A
B
C
D
E
F
G
H
I
J
K
L
M



425 SOUTH WOODS MILL ROAD
CHESTERFIELD, MO
314-682-1500

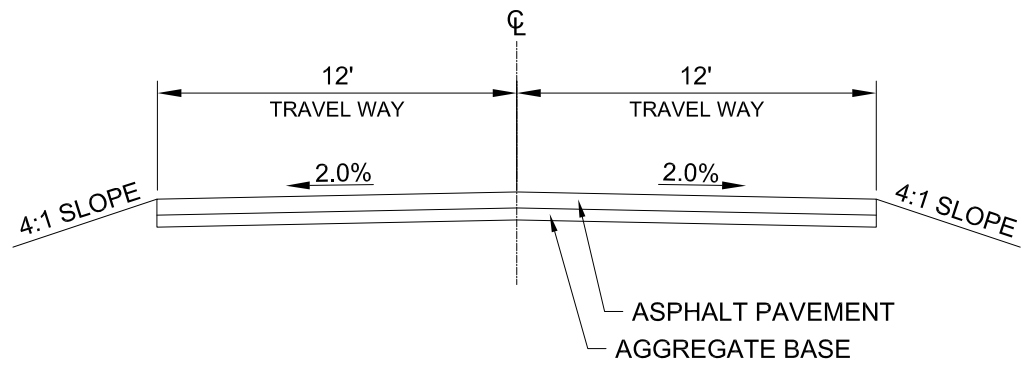
date	JANUARY 3, 2014	detailed	C. HARTMANN
designed	C. HARTMANN	checked	-

AMEREN COG SOLAR PROJECT
5.7 MW DC (4.5 MW AC) PV POWER PLANT
CIVIL GRADING PLAN

project	contract
drawing	rev.
sheet C1	of sheets
file CP001.DWG	

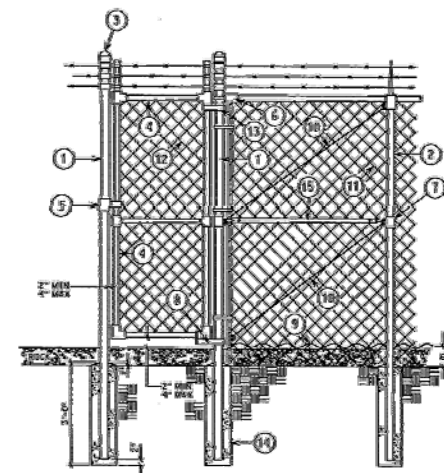
**PRELIMINARY - NOT
FOR CONSTRUCTION**

CIVIL SITE PLAN



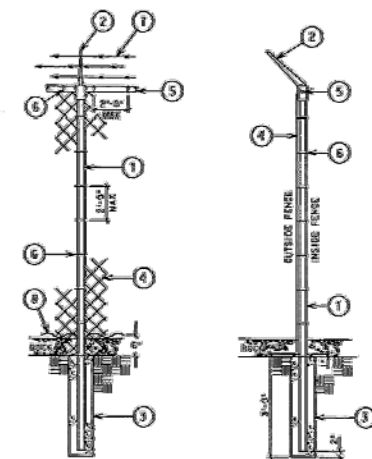
SITE ACCESS ROAD SECTION

B-B
C1



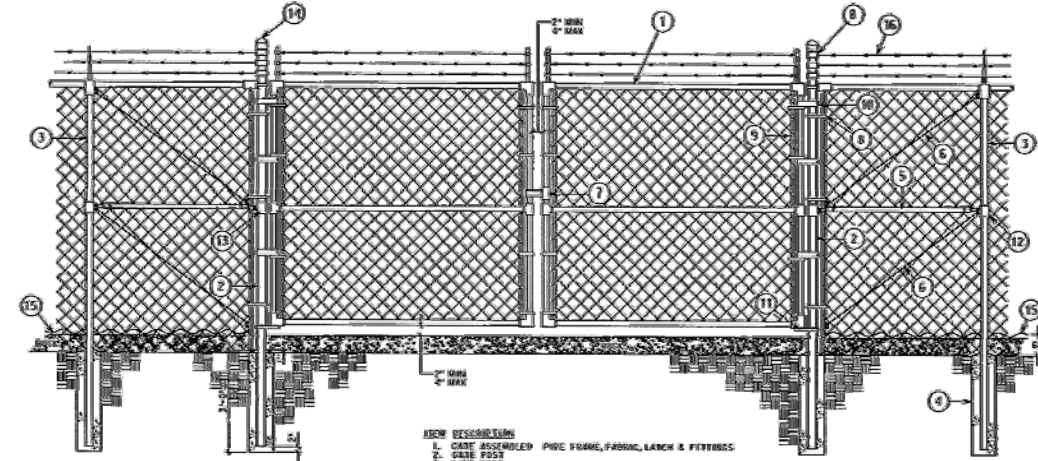
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 20. GATE POST

"TYPICAL MAN GATE SECTION"



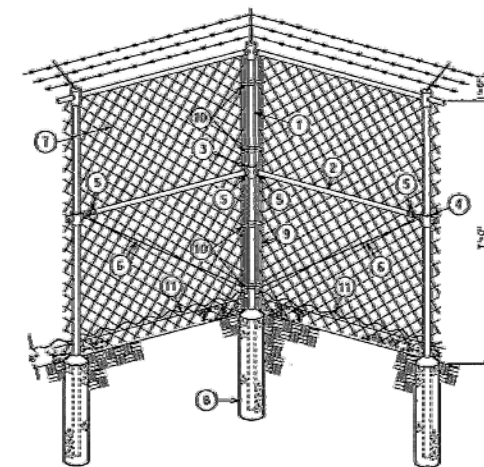
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 18. GATE POST
 19. GATE POST
 20. GATE POST

"TYPICAL LINE POST SECTION"



- ITEM DESCRIPTION
1. TERMINAL GATE POST
 2. GATE POST
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 4. GATE POST
 5. GATE POST
 6. GATE POST
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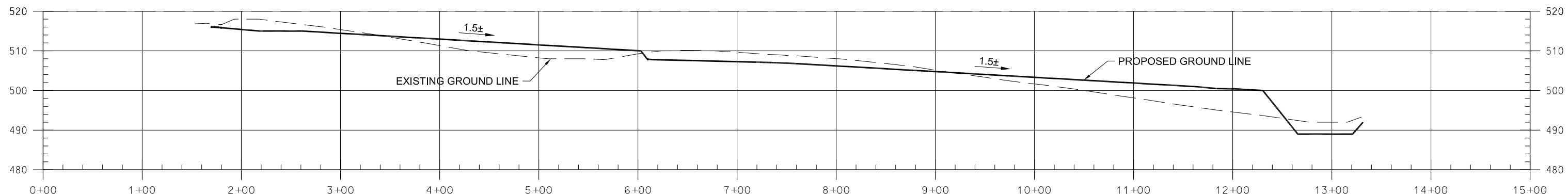
"TYPICAL DRIVE GATE SECTION"



- ITEM DESCRIPTION
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 13. GATE POST
 14. GATE POST
 15. GATE POST
 16. GATE POST
 17. GATE POST
 18. GATE POST
 19. GATE POST
 20. GATE POST

"TYPICAL CORNER SECTION"

FENCE & GATE EXAMPLES



SITE CROSS SECTION

A-A
C1

PRELIMINARY - NOT
FOR CONSTRUCTION



425 SOUTH WOODS MILL ROAD
CHESTERFIELD, MO
314-682-1500

date	JANUARY 3, 2014	detailed	C. HARTMANN
designed	C. HARTMANN	checked	-

AMEREN COG SOLAR PROJECT
5.7 MW DC (4.5 MW AC) PV POWER PLANT
CIVIL DETAILS

project	contract
drawing	rev.
sheet C2	of sheets
file CP010.DWG	

CP010 - A