





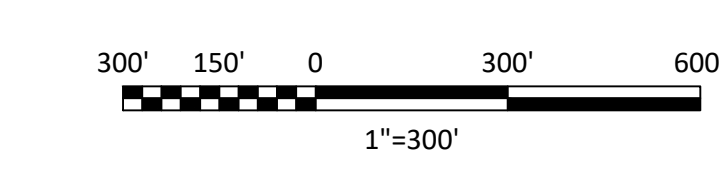
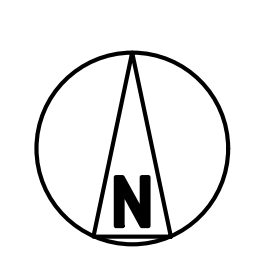
NOTES

1. THE INFORMATION ON THIS SHEET WAS PREPARED BY ERM NC, INCL. ON 05/09/2023 AND MODIFIED BY BLACK & VEATCH.
2. ENTIRE SITE AND WORK AREA IS WITHIN THE EXTRA-TERRITORIAL JURISDICTION OF THE TOWN OF KNIGHTDALE, WAKE COUNTY.
3. LANDSCAPED AREAS REQUIRED BY CHAPTER 7 OF THE UDO SHALL NOT CONTAIN ANY DEVELOPMENT, IMPERVIOUS SURFACES, OR SITE FEATURES THAT DO NOT FUNCTION TO MEET THE APPLICABLE STANDARDS FOR THAT AREA OR THAT REQUIRE REMOVAL OF EXISTING SIGNIFICANT VEGETATION [UDO, SEC. 7.4.E.1].
4. NO GRADING, DEVELOPMENT, OR LAND-DISTURBING ACTIVITIES SHALL OCCUR WITHIN A BUFFER YARD IF FOREST CANOPY, SPECIMEN TREES, OR SIGNIFICANT VEGETATION EXISTS WITHIN THESE AREAS, UNLESS APPROVED BY THE LAND USE ADMINISTRATOR. IF GRADING WITHIN A BUFFER YARD IS PROPOSED, SLOPES OF 1:3 OR LESS ARE ENCOURAGED TO ENSURE THE PROPER TRANSITION OF GRADES TO THE ADJACENT PROPERTY AND TO FACILITATE LANDSCAPING AND MAINTENANCE [UDO, SEC. 7.4.E.2].
5. ALL AREAS WITHIN REQUIRED BUFFER YARDS, STREAM BUFFERS, SLOPE AREAS GREATER THAN 25%, AND WETLANDS ARE TREE SAVE AREAS AND ALL VEGETATION AND SOIL IS TO REMAIN UNDISTURBED [UDO, SEC. 7.4.H.1].
6. ALL TREES GREATER THAN 12" DBH WITHIN FRONT SETBACK AREAS, STREET TREE PLANTING STRIP, AND SLOPE AREAS OF 15-25% ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].
7. ALL TREES GREATER THAN 24" DBH ON-SITE ARE TO REMAIN UNDISTURBED OR REPLACEMENT TREES ARE REQUIRED AT A RATE OF 1 TREE PER 12" DBH, AND SHOULD BE INCORPORATED INTO OPEN SPACE AMENITIES/PUBLIC GATHERING AREAS/PEDESTRIAN PLAZA WHEREVER POSSIBLE. REQUIRED STREET TREES, PARKING LOT LANDSCAPING, AND BUFFER YARD PLANTINGS ARE NOT TO BE COUNTED TOWARDS REPLACEMENT REQUIREMENTS [UDO, SEC. 7.4.H.1].



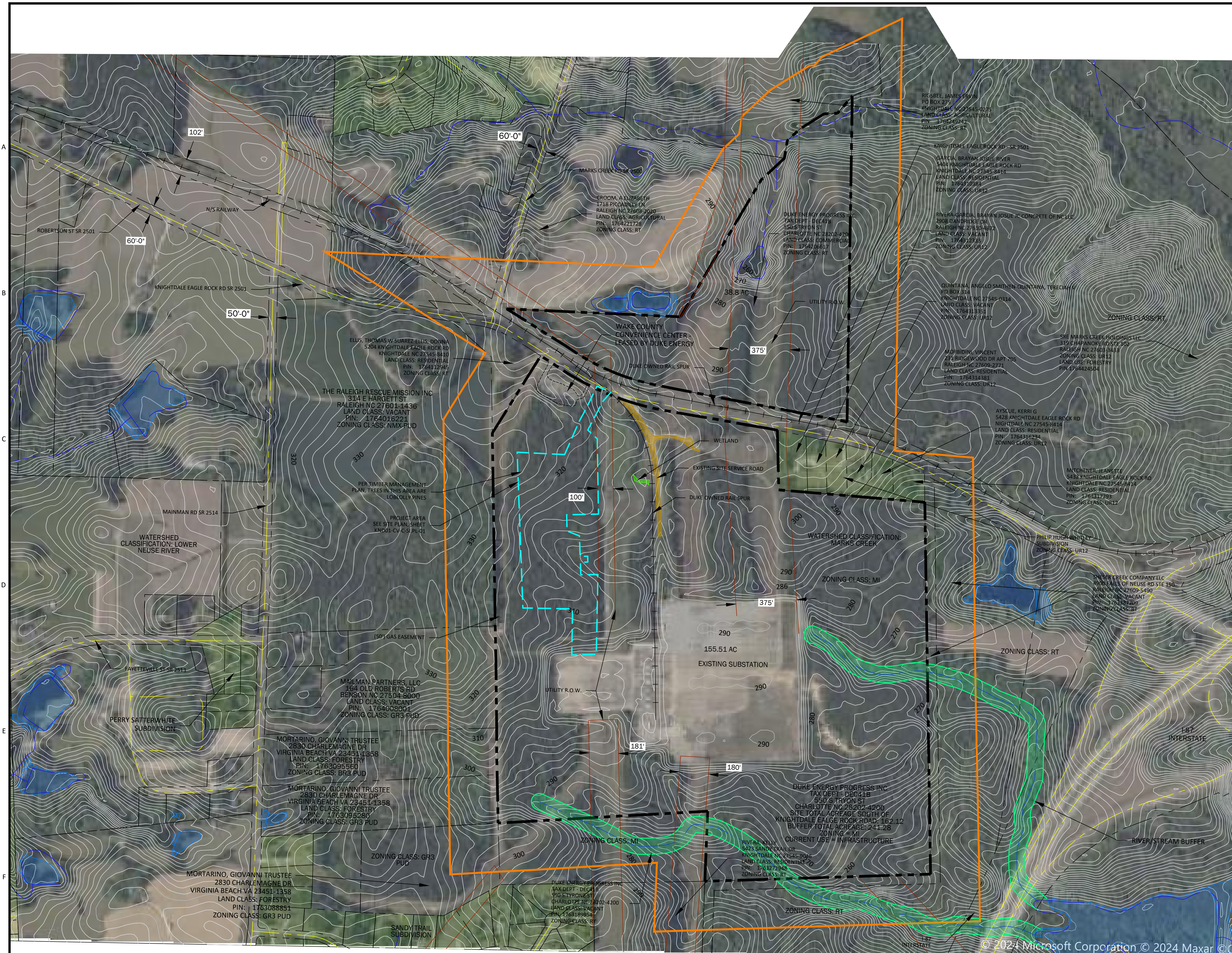
LEGEND

- RIVER AND STREAMS
- PARCELS
- SUBJECT PROPERTY
- PROJECT BOUNDARY
- 300FT PROPERTY BUFFER
- SUBDIVISION



ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.



UJ98274  
 NWSJ D 34422  
 9/22/2024 4:07 PM  
 Civil 3D 2022 Imperial  
 Full Size 1=1

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	27/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	
C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	DSLD	
A	08/22/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	DSLD	

**BLACK & VEATCH**  
Building a world of difference®

DESIGNER: MJM    DRAWN: CLC  
CHECKED: HGU    DATE: 27/SEP/24

**DUKE ENERGY**  
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

ENVIRONMENTAL SURVEY  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-SI.PL-02		D
CODE		
AREA		



NOTES









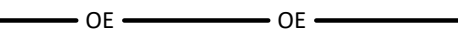






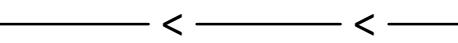
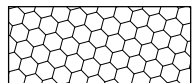
1. TREE CLEARING SHALL BE LIMITED TO THE LIMITS OF DISTURBANCE AS SHOWN ON THIS PLAN.

HORIZONTAL DATUM: NAD83 NORTH CAROLINA STATE PLANES, US FOOT  
 \*STATE PLANE COORDINATES WERE ESTABLISHED BASED IN NGS MONUMENTS "ROSE" AND "TOMB".

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

BENCHMARK: PROJECT LOCALIZATION POINT 'NAIL'  
 N: 740,484.141'  
 E: 2,163,003.135'  
 ELV: 291.02'

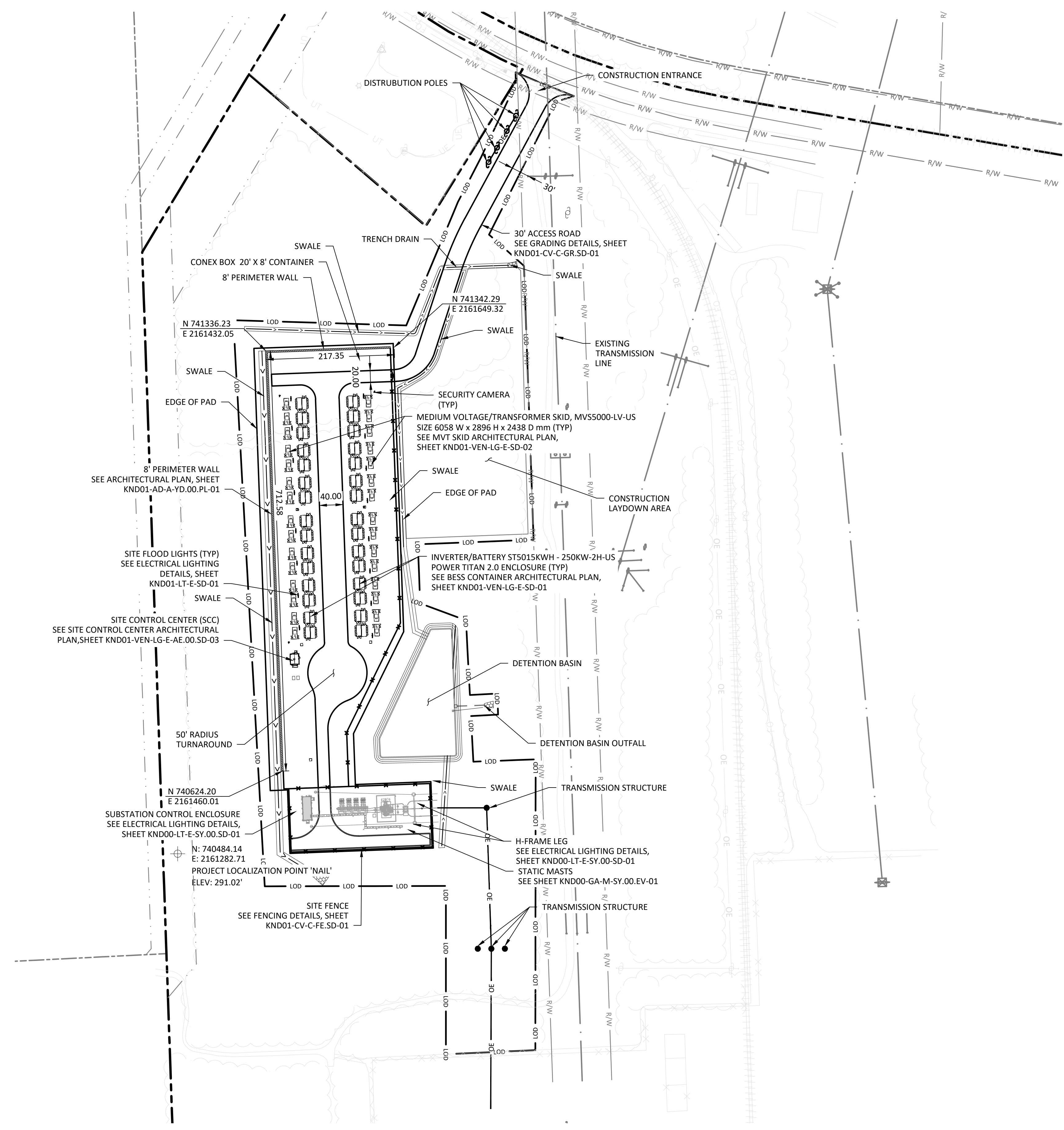
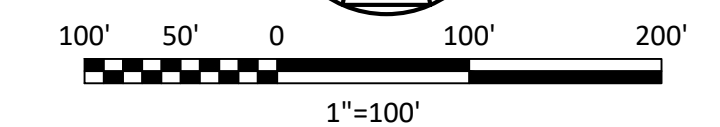
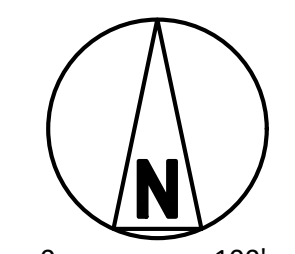
LEGEND

-  ADJACENT PARCEL BOUNDARY
-  PROPOSED SECURITY FENCE
-  EXISTING FENCE
-  PROPOSED ROAD
-  EXISTING TREE LIMITS
-  EXISTING RAILROAD
-  EXISTING OVERHEAD LINE
-  PROPERTY BOUNDARY
-  PROPOSED OVERHEAD ELECTRIC LINES
-  HIGH POWERED OVERHEAD ELECTRIC LINES
-  EXISTING RIGHT-OF-WAY
-  EXISTING FIBER OPTIC CABLE
-  LIMITS OF DISTURBANCE
-  EXISTING TREE LINE
-  PROPOSED PERIMETER WALL
-  PROPOSED VEGETATED SWALE
-  RIP RAP





ISSUED FOR PERMITTING

THE DISTRIBUTION AND USE OF THE NATIVE  
 FORMAT CAD FILE OF THIS DRAWING IS  
 UNCONTROLLED. THE USER SHALL VERIFY  
 TRACEABILITY OF THIS DRAWING TO THE LATEST  
 CONTROLLED VERSION.

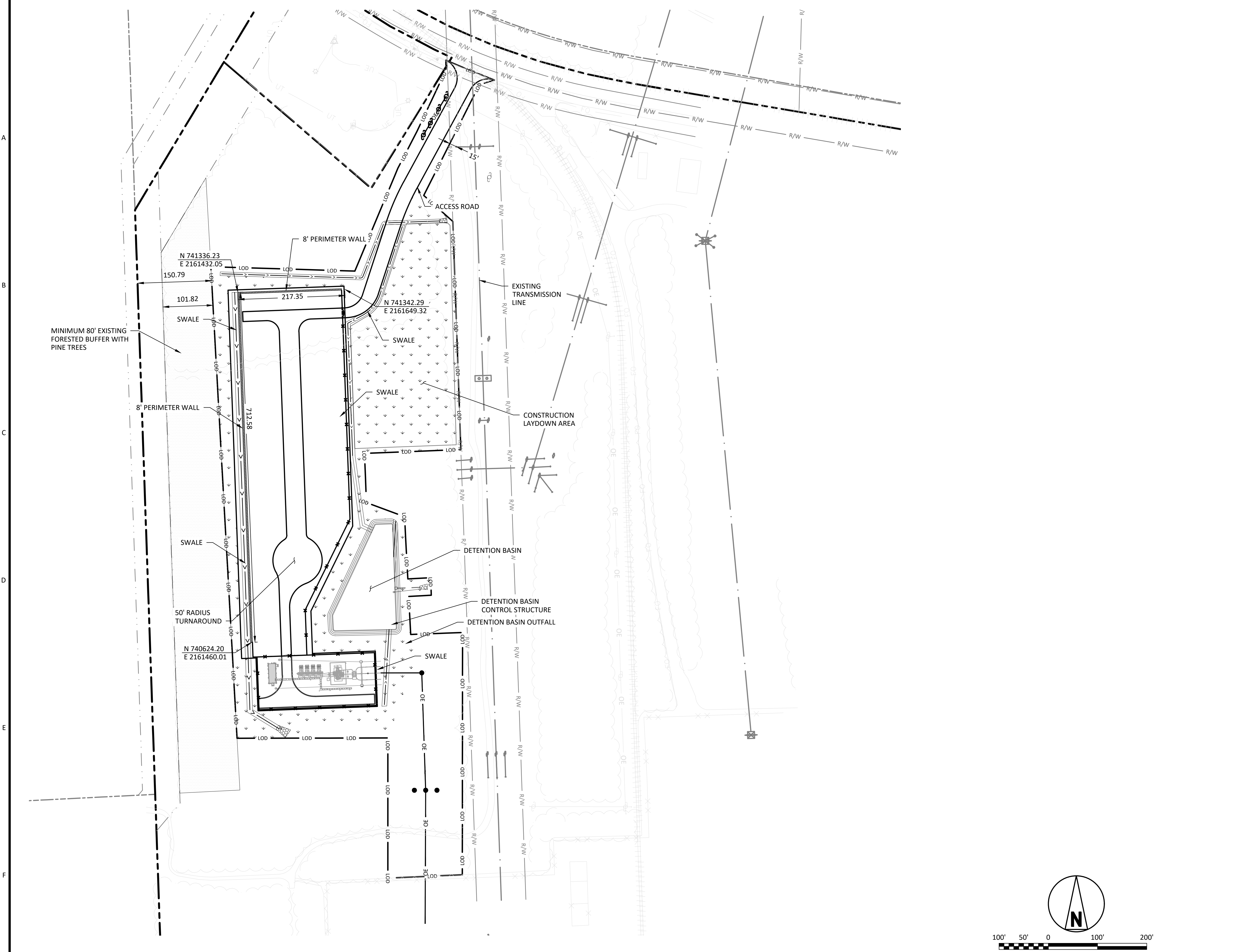


Civil 3D 2022 Imperial  
 Full Site 1=1  
 9/15/2024 7:29 AM  
 Can128649  
 ANS1 D 344-2  
 9/15/2024 7:29 AM

REV	DATE	DESCRIPTION	BY	CHK	APP
D	24/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HG
C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HG
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HG
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HG
NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK

 Building a world of difference®	 DUKE ENERGY KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	PROJECT	DRAWING NUMBER	REV
		419596 KND01-CV-C-SI.PL-01		F
DESIGNER	MJM	DRAWN	CLC	
CHECKED	HGU	DATE	27/SEP/24	
SITE PLAN 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545			CODE	
			AREA	

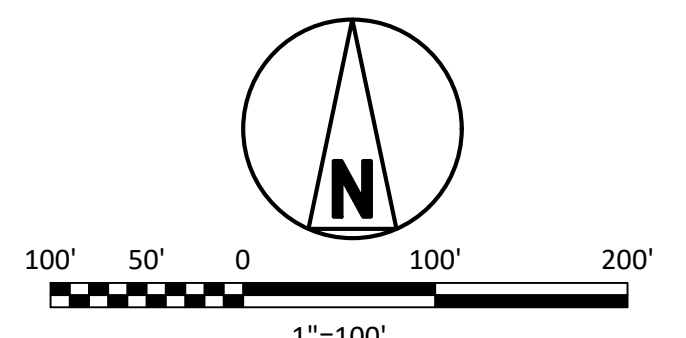




**LEGEND**

	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
	EXISTING FENCE
	PROPOSED ROAD
	EXISTING TREE LIMITS
	EXISTING RAILROAD
	EXISTING OVERHEAD LINE
	PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC LINES
	HIGH POWERED OVERHEAD ELECTRIC LINES
	EXISTING RIGHT-OF-WAY
	EXISTING FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE
	EXISTING TREE LINE
	PROPOSED PERIMETER WALL
	PROPOSED VEGETATED SWALE
	RIP RAP
	BUFFER AREA

**NOTE:**  
 THE LAND USE ADMINISTRATOR RESERVES THE RIGHT TO REQUIRE ADDITIONAL VEGETATION TO BE PLANTED PRIOR TO CERTIFICATE OF OCCUPANCY TO MEET THE PERFORMANCE STANDARDS OF THE TYPE D BUFFER.



**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Civil 3D 2022 Imperial  
 ANS I D 344-22  
 9/15/2024 7:29 AM

				D	25/SEP/2024	ISSUED FOR PERMITTING	CLC MJM HG UDSL D
				C	12/SEP/2024	ISSUED FOR PERMITTING	CLC MJM HG UDSL D
				B	30/AUG/2024	ISSUED FOR 60% REVIEW	CLC MJM HG UDSL D
F	25/OCT/2024	ISSUED FOR PERMITTING	CLC MJM HG UDSL D	A	22/AUG/2024	ISSUED FOR PERMIT	CLC MJM HG UDSL D
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC MJM HG UDSL D	NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN DES CHK PDE APP

**BLACK & VEATCH**  
 Building a world of difference®

DESIGNER: MJM DRAWN: CLC  
 CHECKED: HGU DATE: 27/SEP/24

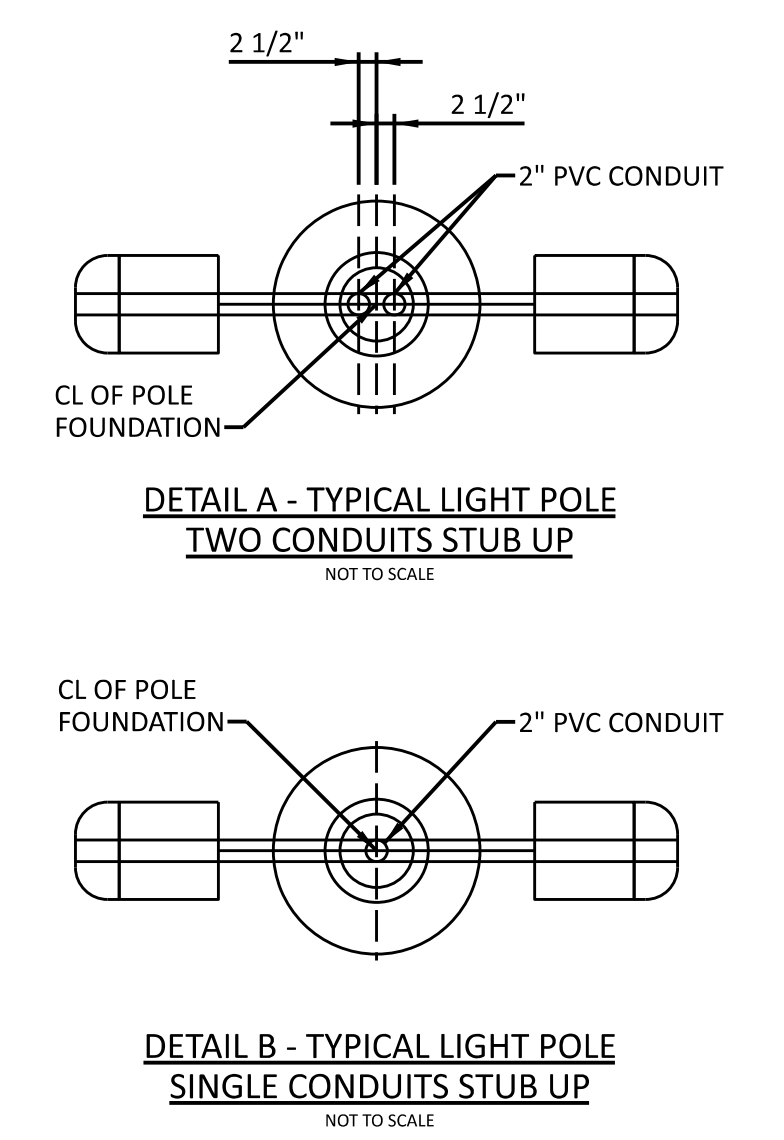
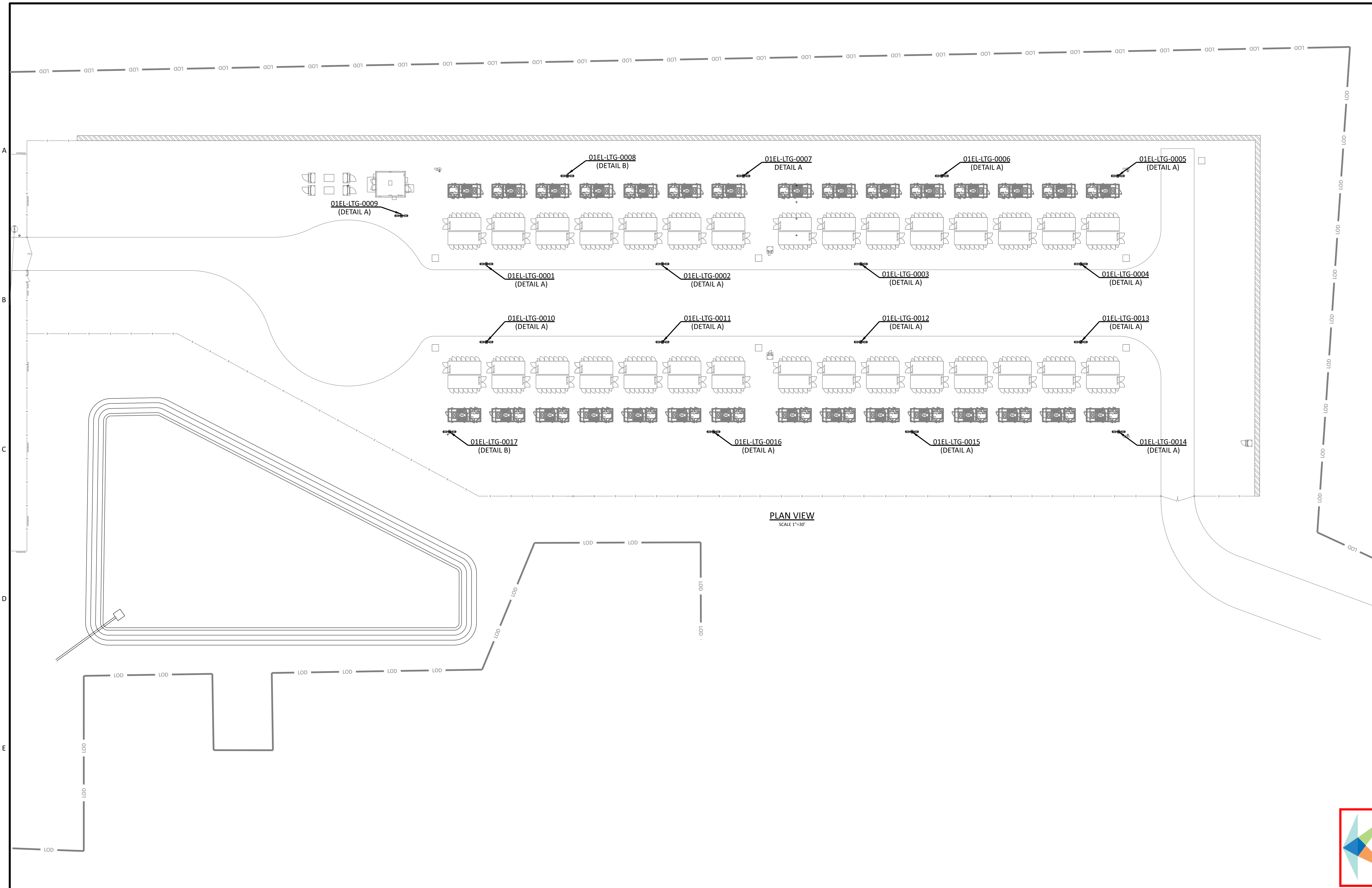
**DUKE ENERGY**  
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

LANDSCAPE PLAN  
 5201 KNIGHTDALE EAGLE ROCK ROAD  
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-AD-A-YD.00.PL-02	F	
CODE	AREA	



- NOTES:
- SEE DWG KND01-CV-C-EC-PL-XX FOR CIVIL SITE PLAN.
  - SEE DWG KND01-CV-C-FD-XX FOR CAMERA & LIGHT POLE FOUNDATION PLAN AND DETAILS.
  - SEE DWG KND01-CV-C-FD-PL-XX FOR STRUCTURAL FOUNDATION LAYOUT.
  - SEE DWG KND01-EN-E-EG-01 FOR ELECTRICAL GRAPHIC SYMBOLS AND GENERAL NOTES.
  - SEE SERIES DWG KN01-LG-E-PL-01 FOR BESS ELECTRICAL ARRANGEMENT.
  - SEE SERIES DWG KND01-UG-E-PL-01 THRU 09 FOR UNDERGROUND CONDUIT.
  - SEE SERIES DWG KND01-GD-E-PL-01 THRU 07 FOR SITE GROUNDING.
  - SEE SERIES DWG KND01-EL-E-CA-01 FOR CIRCUIT LIST AND KND01-EL-E-CA-02 FOR RACEWAY LIST AND DESCRIPTION.



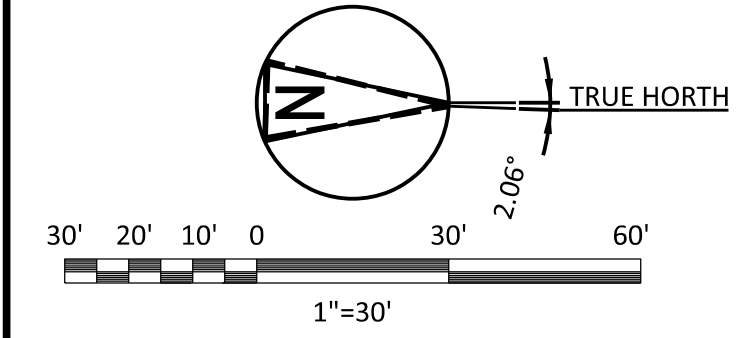
**APPROVED MASTER PLAN**  
 Town of Knightdale  
 Development Services  
 Gideon Smith 10/30/2024

REFERENCE DRAWINGS:  
 KND00-LT-E-SY.00.PL-01 34.5KV - 230KV SUBSTATION LIGHTING PLAN  
 KND01-LT-E-PL-02 BESS ELECTRICAL LIGHTING SURVEY  
 KND01-LT-E-SD-01 BESS ELECTRICAL LIGHTING DETAILS

**ISSUED FOR PERMITTING**  
 THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

A1122837  
 ANS1D 34622  
 09/18/2024 02:29 PM  
 MicroStation v23.00.01.44  
 Full Size 1 = 1

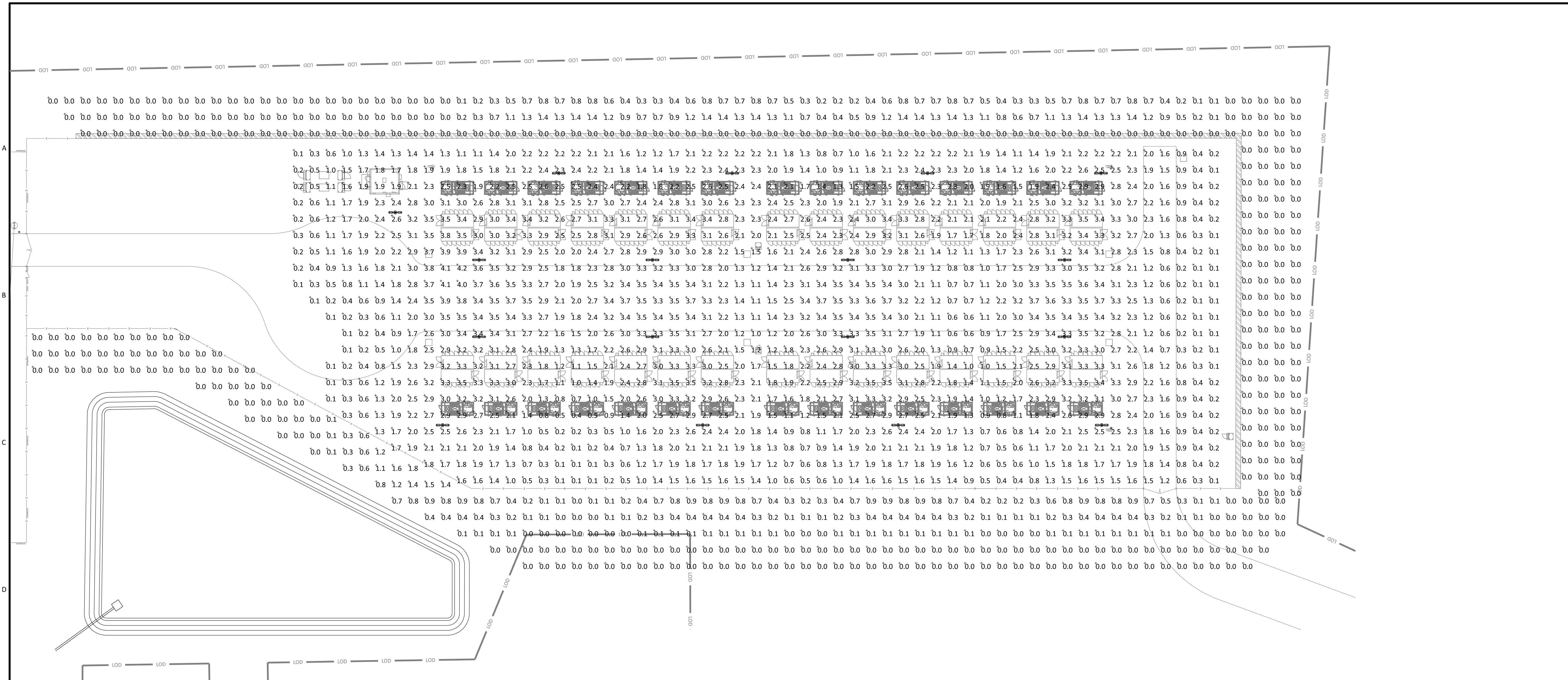


NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	25/OCT/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC
C	13/SEP/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC
B	03/SEP/24	ISSUED FOR CLIENT 60% REVIEW	BCA	BCA	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH CAROLINA SIGNED _____ DATE _____ REG. NO. _____		<b>BLACK &amp; VEATCH</b> <small>11401 LAMAR AVENUE                  OVERLAND PARK, KANSAS 66211</small>	<b>DUKE ENERGY</b> KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	PROJECT <b>KND01-LT-E-PL-01</b>	DRAWING NUMBER <b>KND01-LT-E-PL-01</b>	REV <b>D</b>
DESIGNER BCA	DRAWN BCA	CHECKED OOO	DATE 03/SEP/24	CODE BESS ELECTRICAL LIGHTING PLAN	AREA	





**PHOTOMETRIC CALCULATION DISCLAIMER:**  
LIGHTING CALCULATIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH IES RECOMMENDED PROCEDURES USING AGI32-V20.1. DIFFERENCES BETWEEN CALCULATED VALUES AND POST INSTALLATION VALUES MAY OCCUR DUE TO VARIATIONS WITH FINAL INSTALLATION, PHYSICAL AND/OR ENVIRONMENTAL FACTORS.

- LIGHT FIXTURE LIST NOTES:**
- POLE SHALL BE ROUND TAPERED ALUMINUM 25' TO BE MOUNTED ON SITE BUILT CONC. FOUNDATIONS. NAFCO# VA-RTAA-25-7040-F-AB-FP-BK-PD-NECHH-FST OR ENGINEER APPROVED SIMILAR. POLES REQUIRE A FESTOON BOX LOCATED ON THE SAME SIDE AS THE HAND HOLE, AND 36" ABOVE BASE. PROVIDE GFCI RECEPTACLE AND WATERPROOF IN USE COVER TO FIT HUBBELL #GFRTW20W WITH TAYMAC #HBLSS26WIS COVER OR ENGINEER APPROVED ALTERNATE.  
SEE STRUCTURAL DRAWING KND01-CV-C-FD-XX FOR POLE BASE DETAIL.  
WIND LOADING SHALL BE CONFIRMED BY MANUFACTURER BEFORE SHIPPING TO SUPPORT LIGHT FIXTURES IN 125 MPH WITH (2) 55 LB 1.2 SQ FT FIXTURES INSTALLED.
  - CONTRACTOR SHALL ORDER BACK PLATES FOR EACH FIXTURE BUT SHALL NOT INSTALL THEM UNTIL RESIDENTIAL NEIGHBORS HAVE ACCEPTED INSTALLATION WITHOUT THEM. IF NOT USED AT CLOSE OF PROJECT, TURN OVER ACCESSORIES TO OWNER.
  - PHOTOMETRIC CALCULATION NUMBERS (WHERE SHOWN, ARE IN FOOTCANDLES (FC) SPACED AT 10' X 10'.  
CALCULATION STATISTICS, WITHIN FENCED AREA:  
ILLUMINANCE (FC)  
AVERAGE = 2.05  
MAXIMUM = 4.2  
MINIMUM = 0.1  
MIN/AVG RATIO = 0.05  
MIN/MAX RATIO = 0.02

LIGHTING FIXTURE LIST									
SYMBOL	TYPE	FIXTURE DESCRIPTION / PART NUMBER	INPUT WATTS	VOLTAGE	TOTAL LUMENS	TOTAL LLF	MOUNTING	QTY	
	LP1	(2) HOLOPHANE MCLEDLM-P1-30K-MVOLT-AR-HSS-LT-VT-GRSD-US-SH (1) HOLOPHANE VERTICAL ARMS BR944 (1) NAFCO# VA-RTAA-25-7040-F-AB-FP-BK-PD-NECHH-FST	105 (ea)	120V THRU 277	9275 (ea)	0.83 (ea)	POLE MOUNTED SEE NOTES	34 FIXTURES 17 POLES	

**PHOTOMETRIC CALCULATION DISCLAIMER:**  
LIGHTING CALCULATIONS HAVE BEEN PERFORMED IN ACCORDANCE WITH IES RECOMMENDED PROCEDURES USING AGI32-V20.1. DIFFERENCES BETWEEN CALCULATED VALUES AND POST INSTALLATION VALUES MAY OCCUR DUE TO VARIATIONS WITH FINAL INSTALLATION, PHYSICAL AND/OR ENVIRONMENTAL FACTORS.

**REFERENCE DRAWINGS:**

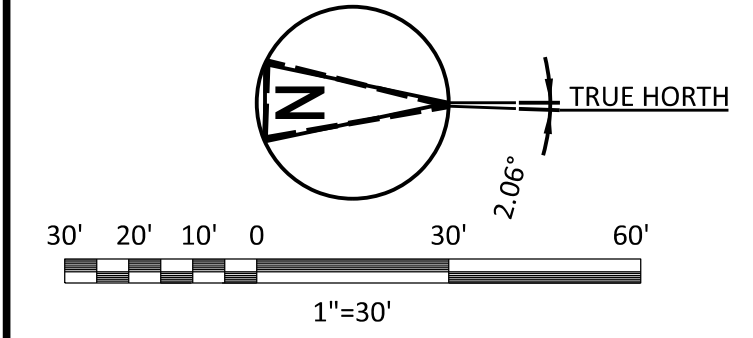
KND00-LT-E-SY.00.PL-01 34.5KV - 230KV SUBSTATION LIGHTING PLAN  
 KND01-LT-E-PL-01 BESS ELECTRICAL LIGHTING PLAN  
 KND01-LT-E-SD-01 BESS ELECTRICAL LIGHTING DETAILS



**ISSUED FOR PERMITTING**  
 THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

MicroStation v23.00.01.44  
ANSI D 34622  
09/17/2024 08:04 AM



DESIGNER	BCA	DRAWN	BCA	DUKE ENERGY	PROJECT	KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM		DRAWING NUMBER	KND01-LT-E-PL-02		REV	B
CHECKED	OOO	DATE	03/SEP/24	BLACK & VEATCH	AREA	ELECTRICAL LIGHTING STUDY OVERALL BESS SITE		CODE	5201 KNIGHTDALE EAGLE ROCK ROAD		KNIGHTDALE, NC 27545	
I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH CAROLINA SIGNED _____ DATE _____ REG. NO. _____ DRN DES CHK PDE APP				PROJECT: KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM AREA: ELECTRICAL LIGHTING STUDY OVERALL BESS SITE		DRAWING NUMBER: KND01-LT-E-PL-02 CODE: 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545		REV: B		B&V PROJECT NUMBER: 419596		





Catalog Number	
Notes	Type

**MGLEDM**  
Mongoose Medium LED



The Mongoose Medium LED offset roadway and area lighting product provides significant energy and maintenance savings vs. HID luminaires. It offers the ultimate in application flexibility with a uniquely designed advanced optical system and attractive appearance. This combined with multiple lighting distributions, mounting options and the ability to tilt the fixture offers unequalled performance in a diverse set of applications ranging from interstates and parking lots.

**Mechanical**

- Rugged grade A360 diecast aluminum (<1% copper)
- Tool-less access with stainless steel latches
- Terminal block in arm
- Rigorous 5-stage pretreatment polyester topcoat to ensure maximum durability that achieves a scribe creepage rating of 8 after 5,000 hours of salt spray
- Removable "power tray" facilitates maintenance
- Corrosion resistant stainless-steel latches ensure secure closure over the long fixture life
- Horizontal mast arms or vertical tenon (VH) and universal mounting to round and square poles (UN) options
- Universal mount mates to all major manufacturer's hole patterns
- All Mountings are 3G vibration rated per ANSI C136.31
- Adjustable fixture tilt from 0-45 degrees provides flexibility to optimize lighting performance

**Electrical**

- Standard surge protection is 20kV/10kA "Extreme Level" per ANSI C136.2
- LED light engines are rated > 100,000 at 25°C, L70
- Electronic driver has an expected life of > 100,000 hours at 25°C
- Rated for -40°C (-40°F) minimum ambient
- Programmable electronic driver with 0-10V control leads
- Driver voltage options: 120-277V 50/60 Hz and 347 50/60 Hz and 480V 50/60 Hz
- Luminaire ships with 0-10v dimmable driver. Luminaire is continuous and step dimming capable via AO option or controls installed on P7 photocontrol receptacle option.

**Optical**

- Performance is comparable to 150-400 watt HPS or 175-1,000 watt MH
- IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation
- IP66 rated optics

**Molded Silicone optics:** Area (Type 5) (AR), Forward Throw (FT), Medium Roadway (MR), Narrow Roadway (NR) and Wide Roadway (WR)

**Borosilicate glass reflector optics:** Area (AG), Forward Throw (FG), Medium Roadway (MG), Narrow Roadway (NG) and Wide Roadway (WG)

- 3500K, 4000K and 5000K CCT, 70 CRI
- Optional Uplight Skirt (US) when used with reflector ensures zero uplight above 90°
- House side shield (HSS), light trespass shield and option available
- Wing guard kit option available

**Controls**

- 7 pin NEMA photocontrol receptacle
- Premium solid-state locking-style photocontrol (PSS) - 10 year rated life
- Extreme long life solid state locking-style photocontrol (PCLL) - 20 year rated life
- Field adjustable output
- night Air motion and daylight sensor
- Programmable motion and daylight sensor

**Certification & Standards**

- CSA Certified to US and Canadian standards
- Suitable for operation in an ambient temperature up to 40°C / 104°F for standard product
- Designlights Consortium (DLC) qualified product. Not all versions of this product may be DLC qualified. Please check the DLC Qualified Products List at [www.designlights.org/QPL](http://www.designlights.org/QPL) to confirm which versions are qualified.

**BUY AMERICAN ACT**

This product is assembled in the USA and meets the Buy American(n) government procurement requirements under FAR, DFARS and DOT regulations. Please refer to [www.acuitybrands.com/buy-american](http://www.acuitybrands.com/buy-american) for additional information.

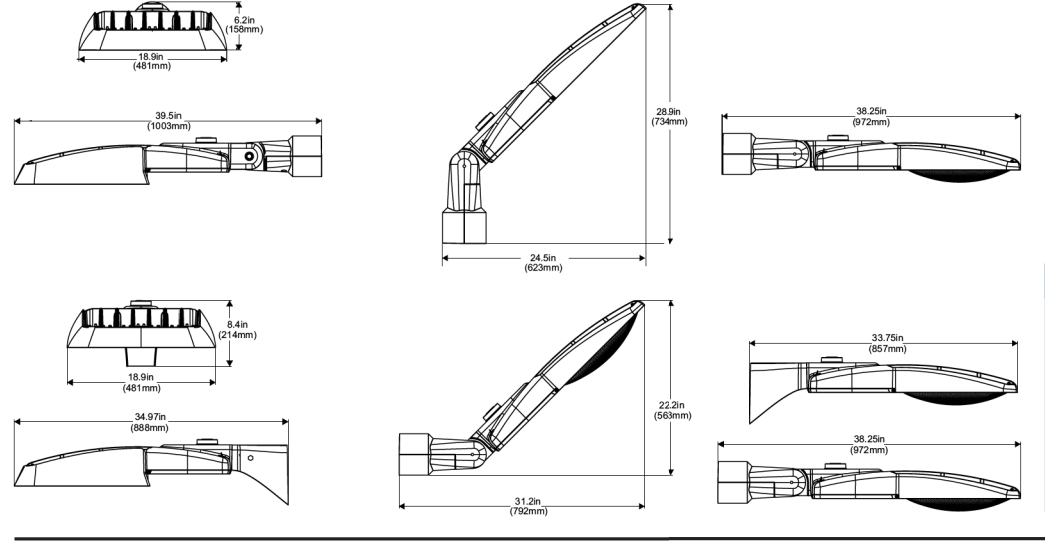
**Warranty**

5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at: [www.acuitybrands.com/support/warranty/terms-and-conditions](http://www.acuitybrands.com/support/warranty/terms-and-conditions)

**Note:** Actual performance may differ as a result of end-user environment and application. All values are design or typical values, measured under laboratory conditions at 25°C



**DIMENSIONAL DATA**



Mounting/Option	Tilt	Weight	EPA
VH	0°	33 lbs.	1.64
VH with Reflector & US	0°	44 lbs.	1.94
VH	45°	33 lbs.	2.85
VH with Reflector & US	45°	44 lbs.	3.15
UN	0°	31 lbs.	1.64
UN with Reflector & US	0°	38 lbs.	1.94

Acuity Brands | Holophane | 3825 Columbus Rd., Granville, OH 43033 | Phone: 866-HOLOPHANE | www.holophane.com  
© 2019-2022 Acuity Brands Lighting, Inc. All rights reserved. Rev. 11/02/22 Specifications are subject to change without notice.

**MGLEDM**  
Mongoose Medium LED



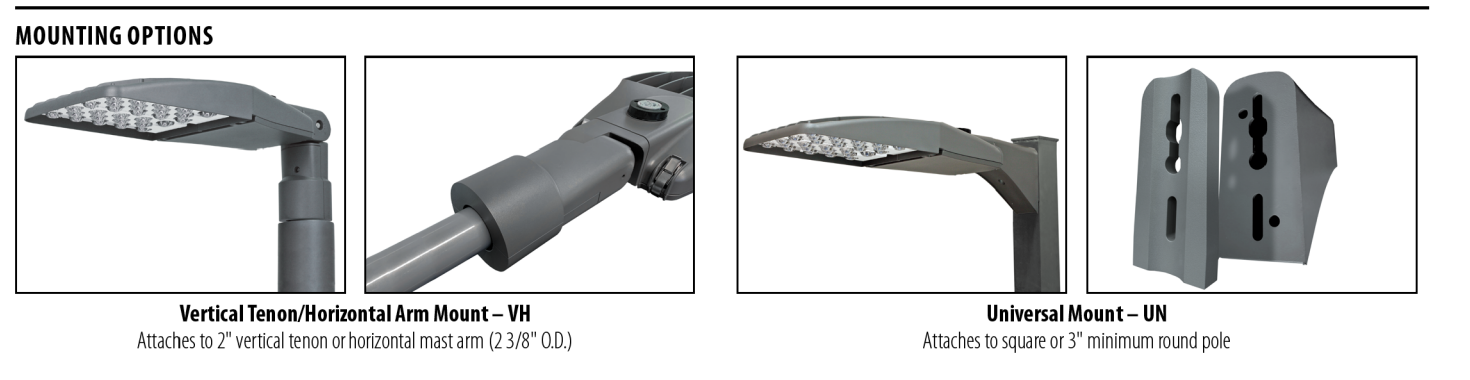
**ORDERING INFORMATION**

Series	LED performance package	Color temperature	Voltage	Optics
MGLEDM Mongoose Medium	P1 15,900 Lumens	30K 3,000 K CCT	MVOLT Auto-sensing voltage (120 thru 277)	AG Area with Reflector
	P2 19,000 Lumens	40K 4,000 K CCT		AR Area
	P3 22,400 Lumens	50K 5,000 K CCT	347 347 Volt	FG Forward Throw with Reflector
	P4 25,800 Lumens		480 480 Volt	FT Forward Throw
	P5 28,900 Lumens			MG Medium Roadway with Reflector
	P6 31,900 Lumens			MR Medium Roadway
	P7 35,100 Lumens			NG Narrow Roadway with Reflector
	P8 38,000 Lumens			NR Narrow Roadway
				WG Wide Roadway with Reflector
				WR Wide Roadway

Mounting	Super Durable Paint	Options	NEMA Label Options
VH Vertical Tenon/Horizontal Arm	GRSD Vitracat Gray	Adjustable/Programmable Options	NL1 NEMA LABEL
UN Universal (Rd. 8 Sq)	GRSD Vitracat Graphite	AO Field Adjustable Output	
	BRSD Vitracat Black	Control Options	NEMA Receptacle Options
	GRSD Vitracat Green	PCLL 07L Extreme Long Life Two-Click Photocontrol for Solid State (20 year rated life)	PRP 7-pin Photocontrol Receptacle
	WRSD Vitracat White	PCCS 055 Premium Two-Click Photocontrol for Solid State (10 year rated life)	SH Shielding Options
	BZSD Vitracat Bronze	POC2 Programmable occ. and daylight sensor, for mounting applications up to 20'	US Uplight Skirt
	DBSD Vitracat Dark Bronze	POC4 Programmable occ. and daylight sensor, for mounting applications between 20' & 40'	HSS House Side Shield
		RSDR Night Air Occ. and daylight sensor	SH Shielding Cap Option

**Accessories:** Order as separate catalog number.

Wire Guard Kit	Mongoose Medium Wire Guard Kit
Light Trespass Shield	Mongoose Medium Light Trespass Shield
Uplight Skirt	Mongoose Medium Uplight Skirt, Vitracat Gray
	Mongoose Medium Uplight Skirt, Vitracat Graphite
	Mongoose Medium Uplight Skirt, Vitracat Black
	Mongoose Medium Uplight Skirt, Vitracat Green
	Mongoose Medium Uplight Skirt, Vitracat White
	Mongoose Medium Uplight Skirt, Vitracat Bronze
	Mongoose Medium Uplight Skirt, Vitracat Dark Bronze
House Side Shield	Mongoose Medium House Side Shield



Acuity Brands | Holophane | 3825 Columbus Rd., Granville, OH 43033 | Phone: 866-HOLOPHANE | www.holophane.com  
© 2019-2022 Acuity Brands Lighting, Inc. All rights reserved. Rev. 11/02/22 Specifications are subject to change without notice.

**MGLEDM**  
Mongoose Medium LED



**PERFORMANCE DATA**

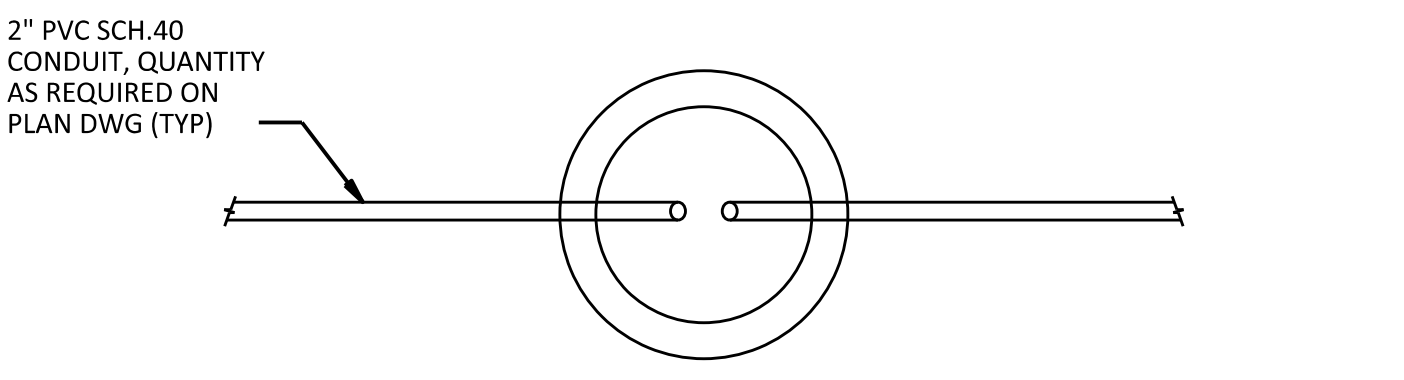
Performance Package	Distribution	Input Watts	30K (3000K CCT, 70 CRI)				40K (4000K CCT, 70 CRI)				50K (5000K CCT, 70 CRI)				LLD @ 25°C				
			Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	Lumens	LPW	B	U	G	50k Hours	75k Hours
P1	AG	15,680	149	4	2	2	16,129	154	4	2	2	16,329	156	4	2	2	0.97	0.97	0.96
	AR	16,915	161	4	0	2	17,400	166	4	0	2	17,616	168	4	0	2			
	FG	14,519	138	2	3	3	14,935	142	2	3	3	15,120	144	3	3	3			
	FT	15,763	150	2	0	3	16,215	154	2	0	3	16,416	156	2	0	3			
	MG	15,064	143	2	2	2	15,496	148	2	2	2	15,687	149	3	2	2			
	MR	16,193	154	2	0	2	16,657	159	3	0	3	16,863	161	3	0	3			
	NG	15,292	146	3	2	2	15,731	150	3	2	2	15,925	152	3	2	2			
	NR	16,326	155	3	0	2	16,794	160	3	0	2	17,002	162	3	0	2			
WG	14,577	139	3	2	3	14,994	143	3	2	3	15,180	145	3	2	3				
WR	15,746	150	3	0	3	16,198	154	3	0	3	16,398	156	3	0	3				
P2	AG	19,225	153	4	2	2	19,776	157	4	2	2	20,021	159	4	3	2	0.97	0.97	0.96
	AR	20,740	165	4	0	2	21,335	169	4	0	2	21,599	171	4	0	2			
	FG	17,802	141	3	3	3	18,313	145	3	3	4	18,539	147	3	3	4			
	FT	19,328	153	3	0	4	19,882	158	3	0	4	20,128	160	3	0	4			
	MG	18,470	147	3	2	3	19,000	151	3	2	3	19,235	153	3	2	3			
	MR	19,854	158	3	0	3	20,423	162	3	0	3	20,676	164	3	0	3			
	NG	18,750	149	3	2	2	19,288	153	3	2	2	19,527	155	3	2	3			
	NR	20,018	159	3	0	2	20,592	163	3	0	2	20,847	165	3	0	2			
WG	17,873	142	3	3	3	18,385	146	3	3	3	18,613	148	3	3	3				
WR	19,307	153	3	0	3	19,860	158	3	0	3	20,106	160	3	0	3				

**NOTES:**

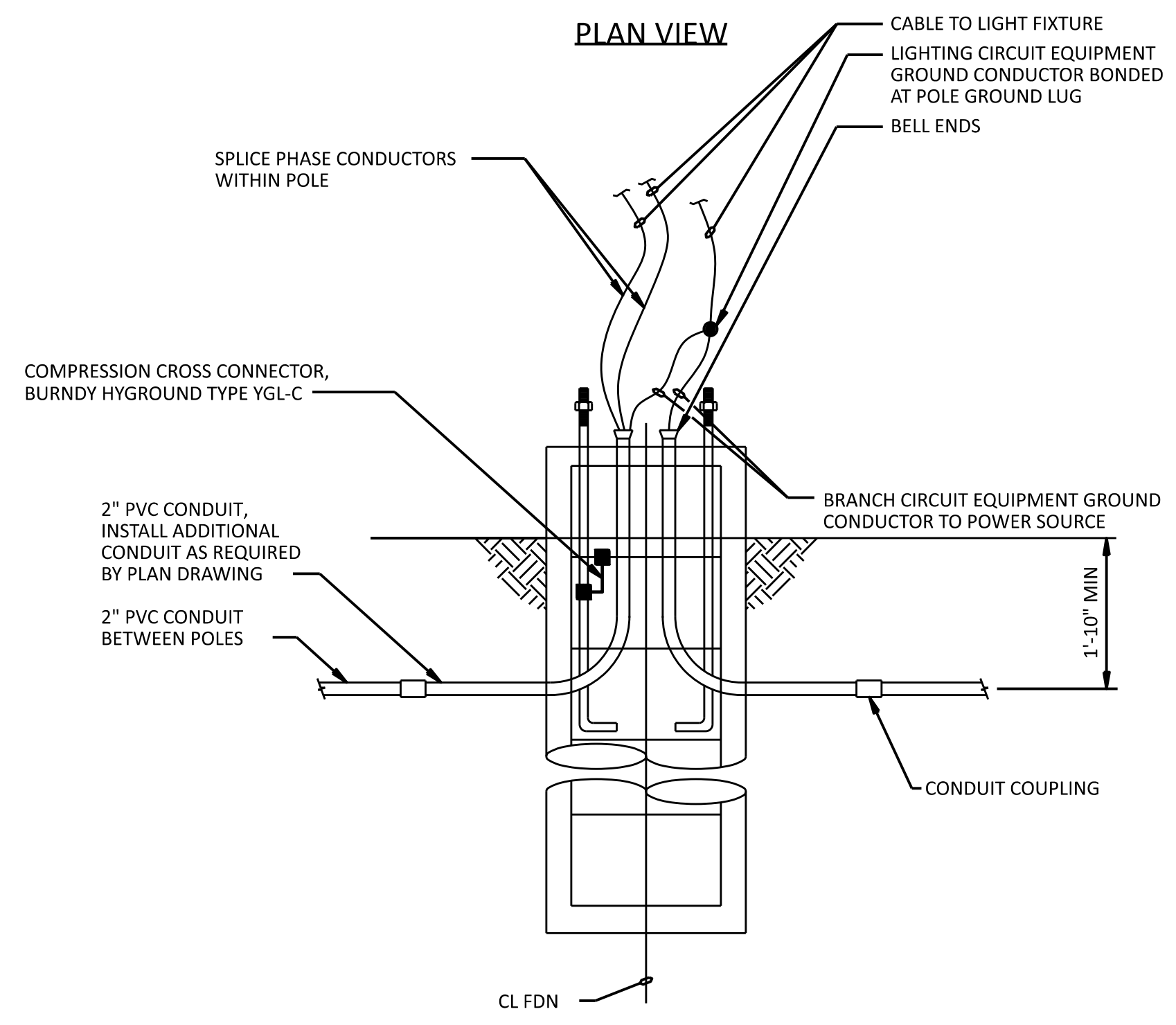
- FOR ELECTRICAL GRAPHIC SYMBOLS, SEE DRAWING KND01-EN-E-EG-01.
- ALL ELEVATIONS REFER TO THE BOTTOM OF THE LIGHTING FIXTURE.
- ALL LIGHTING SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE AND SECTION 7.7 OF THE TOWN OF KNIGHTDALE UDO.
- ALL ABOVE GRADE CONDUITS SHALL BE RIGID GALVANIZED STEEL. ALL BELOW GRADE CONDUITS SHALL BE PVC SCHEDULE 40.
- ALL ABOVE GRADE LIGHTING CONDUITS SHALL BE FIELD ROUTED BY THE CONTRACTOR. ALL BELOW GRADE LIGHTING CONDUITS WERE INSTALLED UNDER THE UNDERGROUND RACEWAY DRAWING AND ARE LABELED IN LIGHTING PLAN DRAWING.
- ALL SL FIXTURE BRANCH CIRCUIT CONDUCTORS SHALL BE SIZE #10 AWG, UNLESS OTHERWISE NOTED.
- ALL SWL FIXTURE CONDUCTORS BETWEEN POLES AND CONTACTOR SHALL BE #10 AWG MINIMUM, UNLESS OTHERWISE NOTED. ALL LIGHTING CIRCUIT CONDUCTORS WITHIN THE LIGHTING POLES SHALL BE #12 AWG MINIMUM, UNLESS OTHERWISE NOTED.
- CONNECTIONS BETWEEN THE UNDERGROUND LIGHTING CONDUCTORS AND THE LIGHTING CONDUCTORS WITHIN THE LIGHTING POLES SHALL BE INSTALLED, SIZE AS RECOMMENDED BY THE FIXTURE MANUFACTURER.
- ALL GROUNDING CONDUCTORS SHALL BE GREEN.
- ONLY HOME RUNS TO PANEL ARE SHOWN ON THE DRAWING. THE CONTRACTOR SHALL INSTALL ALL LIGHTING CIRCUITING TO LIGHTING FIXTURES AND RECEPTACLES FOR AN OPERATING SYSTEM. ALL AC CIRCUITS SHALL HAVE A GROUND CONDUCTOR.

**REFERENCE DRAWINGS:**

KND01-LT-E-PL-01 SITE LIGHTING PLAN



**PLAN VIEW**

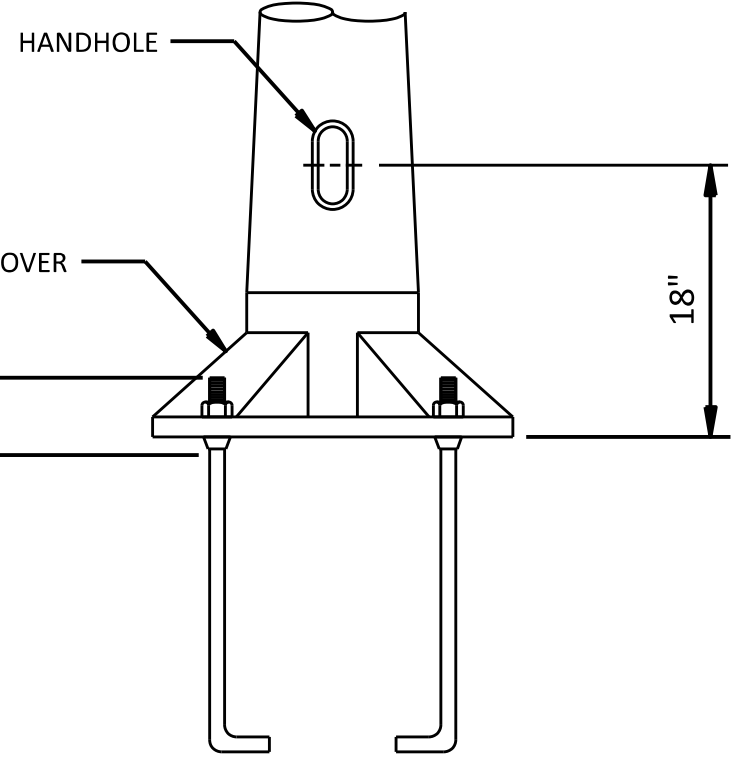


**ELEVATION**

**DETAIL A**

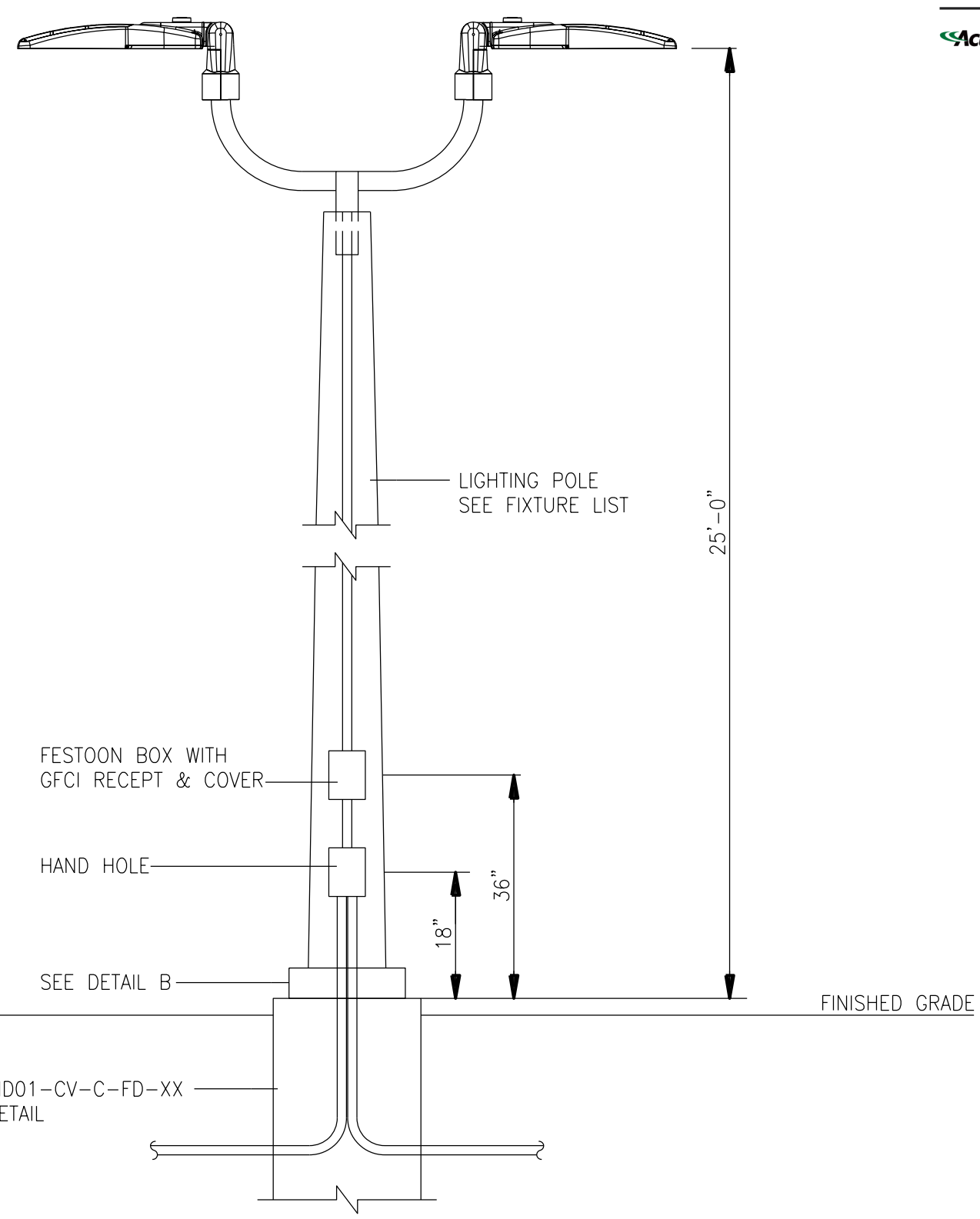
**TYPICAL SITE LIGHTING POLE CONCRETE FOUNDATION**  
NO SCALE

**NOTES:**  
1. FOR FOUNDATION INSTALLATION SEE CIVIL DRAWING KND01-CV-C-FD-XX.



**DETAIL B**

**TYPICAL SITE LIGHTING POLE - HANDHOLE**  
NO SCALE



**DETAIL C**

**TAPERED ALUMINUM POLE FOR LIGHTING**  
NO SCALE

MicroStation V23.00.01.44  
ANSI D 34622  
09/17/2024 12:33 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
C	20/SEP/24	RE-ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC
B	03/SEP/24	ISSUED FOR CLIENT 60% REVIEW	BCA	BCA	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT	BCA	BCA	OOO	OOO	BC

**BLACK & VEATCH**  
DESIGNER: BCA  
DRAWN: BCA  
CHECKED: OOO  
DATE: 03/SEP/24

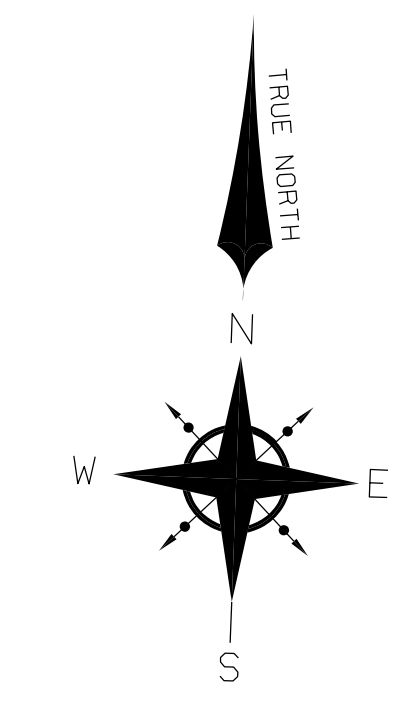
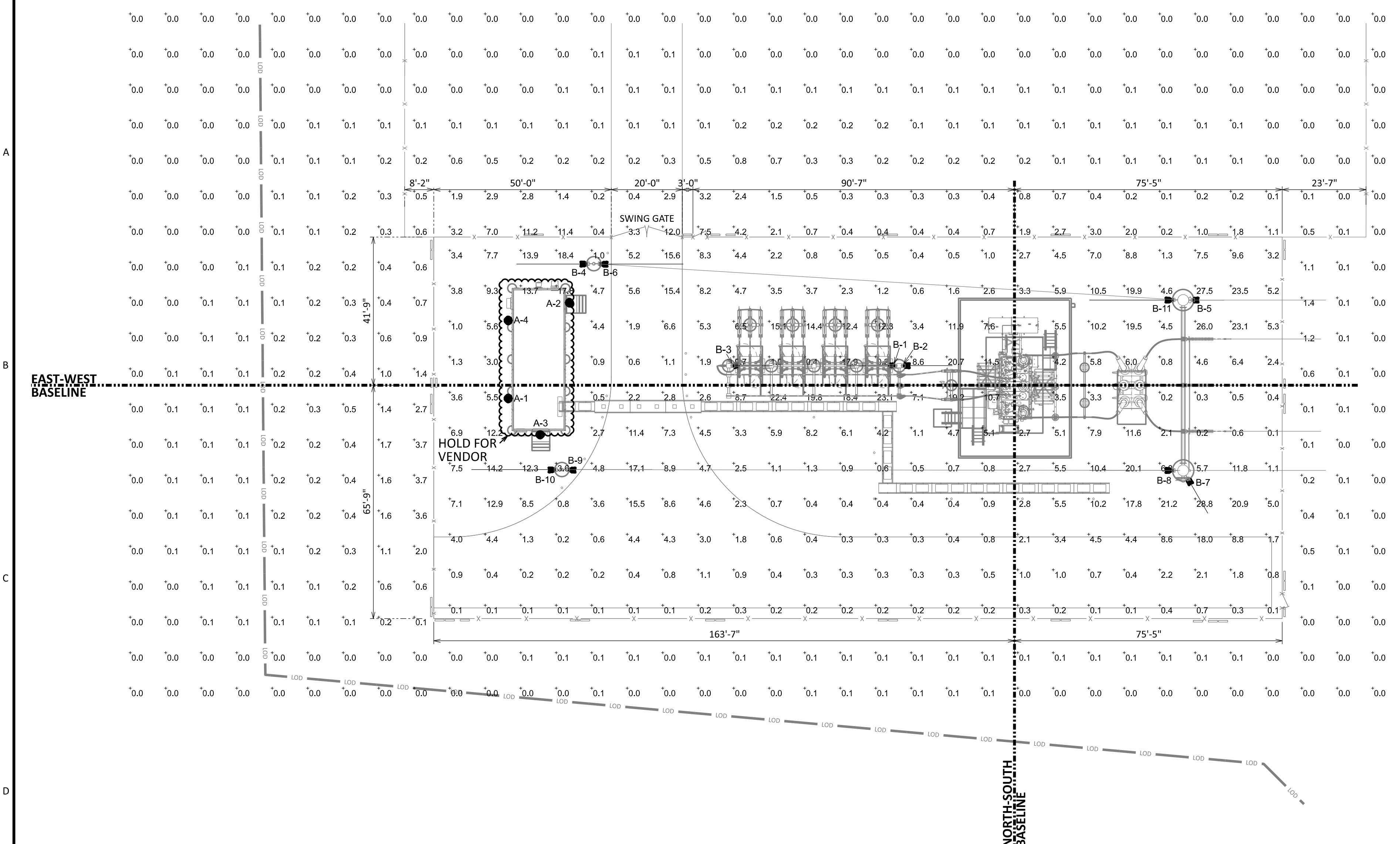
**DUKE ENERGY**  
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM  
BESS ELECTRICAL LIGHTING DETAILS  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

**PROJECT** KND01-LT-E-SD-01  
**DRAWING NUMBER** KND01-LT-E-SD-01  
**REV** C  
**B&V PROJECT NUMBER:** 419596

**APPROVED MASTER PLAN**  
Town of Knightdale  
Development Services  
Gideon Smith 10/30/2024

**ISSUED FOR PERMITTING**  
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.





Luminaire Locations			
No.	Label	MH	Tilt
1	A	10'-6"	0.00
2	A	10'-6"	0.00
3	A	10'-6"	0.00
4	A	10'-6"	0.00
1	B	23'-6"	30.00
2	B	23'-6"	30.00
3	B	23'-6"	25.00
4	B	23'-9"	40.00
5	B	23'-0"	20.00
6	B	23'-9"	45.00
7	B	23'-0"	25.00
8	B	23'-0"	45.00
9	B	23'-9"	45.00
10	B	23'-9"	45.00
11	B	23'-0"	45.00

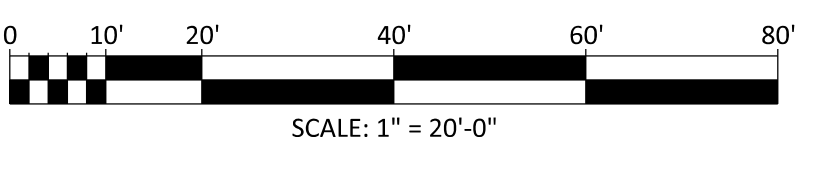
Schedule													
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Filename	Lumens Per Lamp	Lumen Multiplier	Light Loss Factor	Efficiency	Wattage	Distribution
	A	4	COOPER LIGHTING SOLUTIONS - LUMARK (FORMERLY EATON)	XTOR3B-W	CROSSTOUR 26W WALL MOUNT LED	1	XTOR3B-W.ies	2709	1	0.85	100%	25.5	
	B	11	American Electric Lighting	ACPOLED P40 XXXXX 55 ACPOLEDFV	ACP Small LED Floodlight with P40 Performance Package, Flood (5x5) (formally FL), 4000K CCT, 70CRI with Full Visor	1	ACPOLED P40 XXXXX 55 ACPOLEDFV.ies	Absolute	1	0.85	100%	154	5 X 5

Statistics					
Description	Symbol	Max	Min	Avg	AVERAGE TO MINIMUM FC RATIO
Substation	+	28.8 fc	0.1 fc	5.3 fc	53
Perimeter	+	12.0 fc	0.0 fc	0.4 fc	-

**NOTE:**  
1. FIELD TO CONFIRM SUFFICIENT LIGHT ORIENTATION AND ILLUMINATION LEVELS WITH DUKE PERSONNEL.



**ISSUED FOR PERMITTING**  
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.



A1122837  
 ANS/D 3422  
 08/20/2024 03:53 PM  
 MicroStation v23.00.01.44  
 Full Size 1 = 1

				<b>DUKE ENERGY</b> KNIGHTDALE BESS		PROJECT 419596 KND00-LT-E-SY.00.PL-01		DRAWING NUMBER A	
DESIGNER	BCA	DRAWN	BCA	ELECTRICAL LIGHTING PLAN 5201 KNIGHTDALE EAGLE ROCK ROAD KNIGHTDALE, NC 27545		CODE		REV A	
CHECKED	VC	DATE	23/AUG/24			AREA			

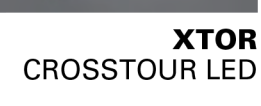


DESCRIPTION
The patented Lumark Crosstour™ LED Wall Pack Series of luminaires provides an architectural style with super bright, energy efficient LEDs. The low profile, rugged die-cast aluminum construction, universal back box, stainless steel hardware along with a sealed and gasketed optical compartment make the Crosstour impervious to contaminants. The Crosstour wall luminaire is ideal for wall-to-wall, inverted mount for facade/entry illumination, post/bollards, site lighting, floodlight and low level pathway illumination including stairs. Typical applications include building entrances, multi-use facilities, apartment buildings, institutions, schools, stairways and loading docks test.

Lumark

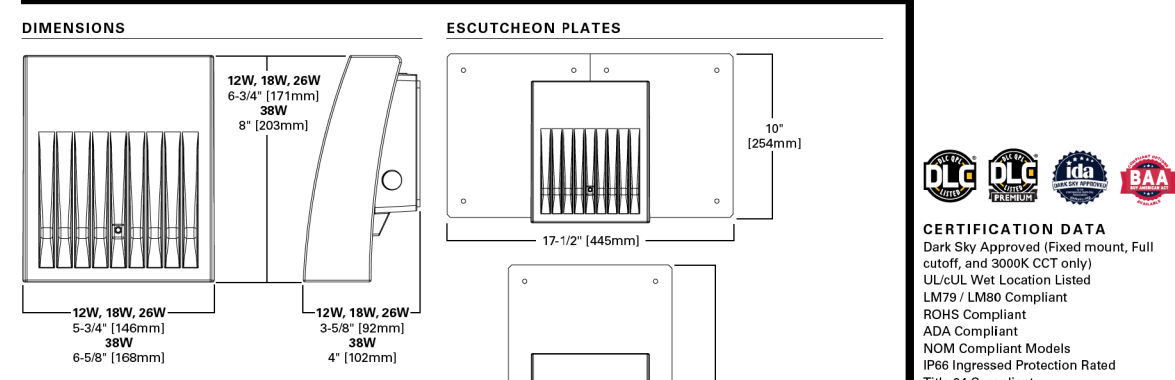
Table with columns: Catalog #, Type, Project, Date, Comments, Prepared by.

CONSTRUCTION
Slim, low-profile LED design with rugged one-piece, die-cast aluminum hinged removable door and back box. Matching housing styles incorporate both a small and medium design. The small housing is available in 12W, 18W and 20W. The medium housing is available in the 36W model. Patented secure lock hinge feature allows for safe and easy tool-less electrical connections with the supplied push-in connectors. Back box includes three half-inch, NPT threaded conduit entry points. The universal back box supports both the small and medium forms and models to standard 3-1/2" to 4" round and octagonal, 4" square, single gang and masonry junction boxes. Key hole gasket allows for adaptation to junction box or wall. External fin design extracts heat from the fixture surface. One-piece silicone gasket seals door and back box. Minimum 5" wide pool for site lighting application. Not recommended for car wash applications.



XTOR CROSSTOUR LED

APPLICATIONS: WALL / SURFACE POST / BOLLARD FLOODLIGHT LOW LEVEL FLOODLIGHT INVERTED SITE LIGHTING



CERTIFICATION DATA
DLC Qualified Product
BAA - Buy American Act
BABA - Build America Buy America

POWER AND LUMENS BY FIXTURE MODEL
Table with columns: LED Information, Lumen, Power, etc. for various models like XTOR1B, XTOR1W, etc.

XTOR CROSSTOUR LED
Series 1
XTOR1B-Small Door, 12W
XTOR1B-Small Door, 18W
XTOR1B-Medium Door, 36W

LED Matrix Color, Housing Color, Options (Add as Suffix), Accessories (Order Separately)
Table listing various options and accessories for the luminaire.

NOTES
1. Domestic and Export Qualification and classified for both DLC Qualified and DLC Premium, refer to www.designlights.org for details.

STOCK ORDERING INFORMATION
Table with columns: Domestic Preference, 12W Series, 18W Series, 20W Series, 36W Series.

NOTES
1. Only product configurations with these designated prefixes are built to be compliant with the Buy American Act of 1930 (BAA) or Trade Agreements Act of 1919 (TAA), respectively. Please refer to www.designlights.org for more information.

ACPOLED Series American Compact LED Floodlight

PERFORMANCE PACKAGES
Table with columns: Performance Package, Distribution, Input Watts, Lumens, LPW, etc. for different CCT and CR values.

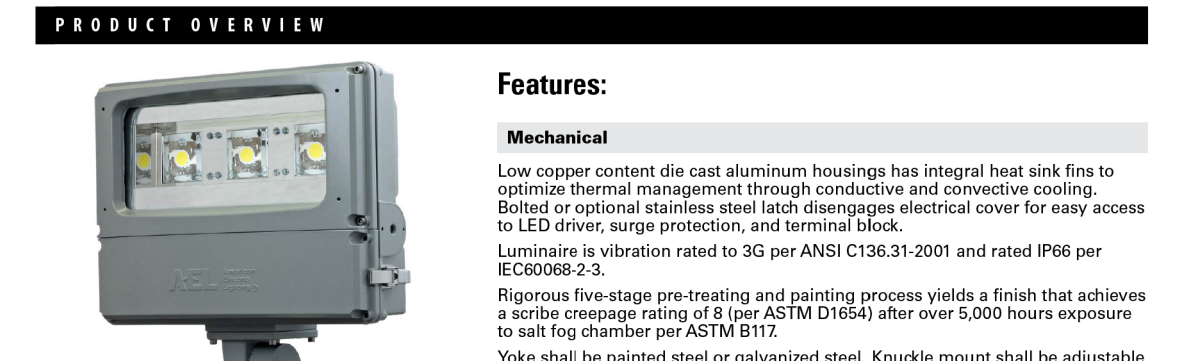
ORDERING INFORMATION
Series, LED Performance Package, Voltage, Optics, Color Temperature

Table showing Series (ACPO1, ACPO2, ACPO3, ACPO4, ACPO5, ACPO6) and LED Performance Package (P01-P06) with corresponding Voltage and Optics.

Table showing Mounting Methods (T1-T6), Color (Blank, BK, RZ, GR, WH), Surge Protection (Blank, SP), Optics (Blank, P1-P4, P5-P8, P9-P12), and Cord Length (C04-C10).

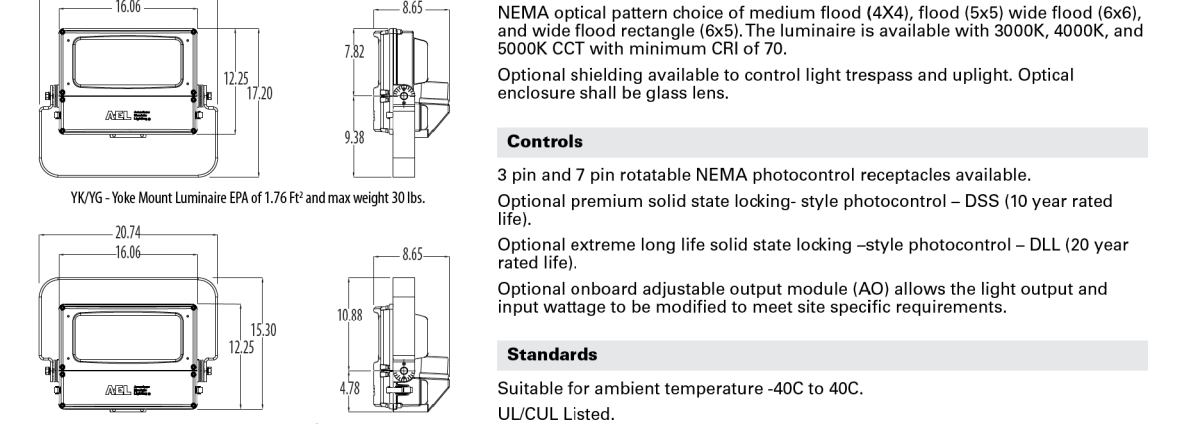
Table showing Cord Type (C1-C2), Microlumens (M1-M2), and Accessories (A1-A10).

ACPOLED Series American Compact LED Floodlight



PRODUCT OVERVIEW

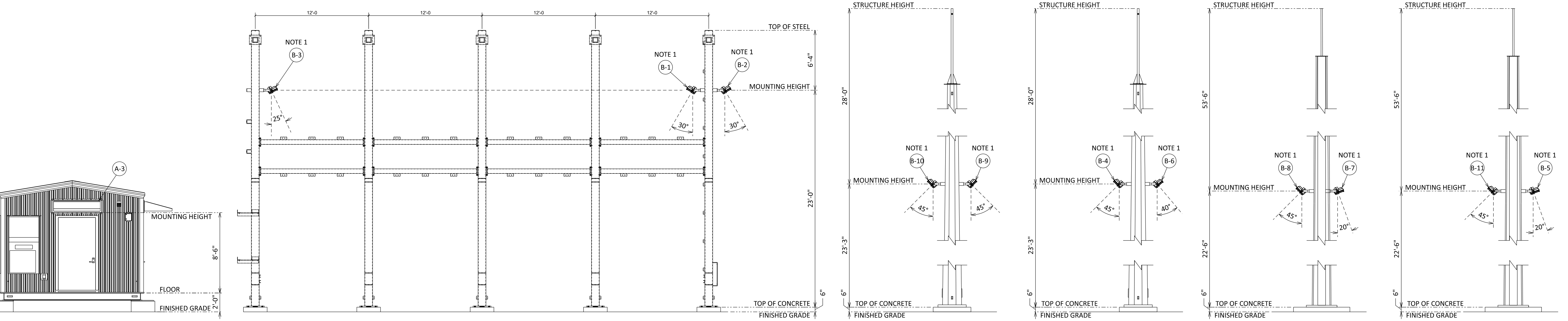
Features:
Mechanical: Low copper content die cast aluminum housings has integral heat sink fins to optimize thermal management through conductive and convective cooling.
Electrical: LED light engine is rated for > 100,000 hours at 75C, L70. Electronic driver has an expected life of 100,000 hours at a 25C ambient.



Applications: Auto dealerships, Schools, Churches, Industrial sites, Shopping centers, Parking lots, Substations, Building facades.
Standards: Suitable for ambient temperature -40C to 40C.



MicroStation V23.00.01.44
ANSI D 3622
8/20/2024 04:08 PM



CONTROL HOUSE DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

34.5kV BAY DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

SOUTH STATIC MAST DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

NORTH STATIC MAST DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

SOUTH H-FRAME LEG DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

NORTH H-FRAME LEG DETAIL REF. DWG. KND00-LT-E-SY.00.PL-01

LEGEND:
XX LIGHT NO. SEE DWG KND00-LT-E-SY.00.PL-01

NOTES:
1. FLOODLIGHTS TO BE INSTALLED WITH FULL VISORS

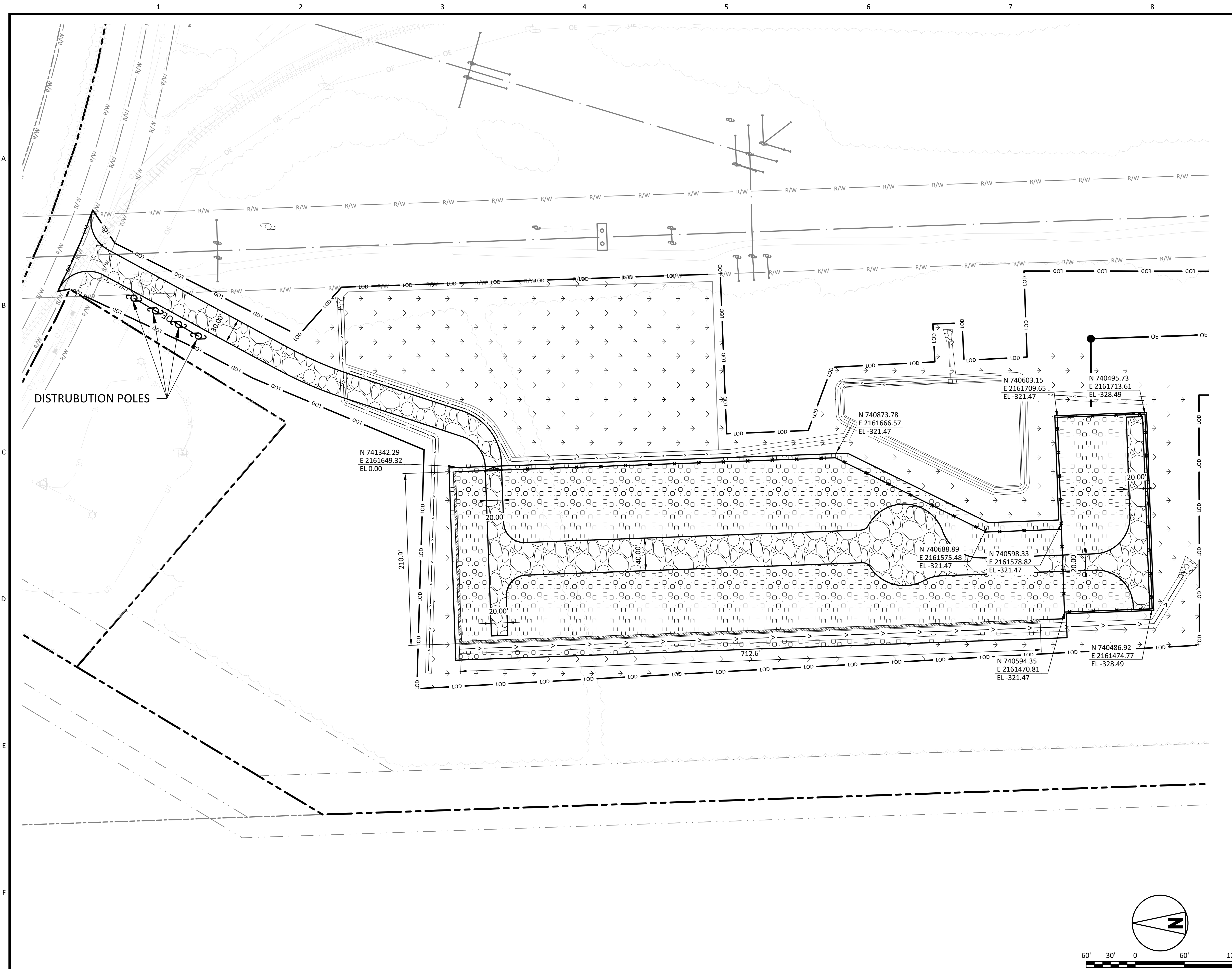


APPROVED MASTER PLAN
Town of Knightdale
Development Services
Gideon Smith 10/30/2024

ISSUED FOR PERMITTING
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Table with columns: NO, DATE, REVISIONS AND RECORD OF ISSUE, DESIGNER, DRAWN, CHECKED, DATE, PROJECT, DRAWING NUMBER, REV.





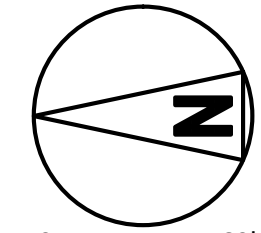
**NOTES**

1. BARBED WIRE OR CHAIN LINK FENCES ARE RESTRICTED TO THE REAR YARD, SHALL NOT BE VISIBLE FROM A STREET RIGHT-OF-WAY, AND SHALL NOT BE ADJACENT TO ANY LOT IN OR ZONED FOR RESIDENTIAL USE PER SECTION 7.6.C OF THE UDO."

**LEGEND**

	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
	EXISTING FENCE
	PROPOSED ROAD
	EXISTING TREE LIMITS
	EXISTING RAILROAD
	EXISTING OVERHEAD LINE
	PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC LINES
	EXISTING RIGHT-OF-WAY
	EXISTING FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE
	EXISTING TREE LINE
	PROPOSED PERIMETER WALL
	PROPOSED VEGETATED SWALE
	RIP RAP
	GRASS SURFACING
	ABC PER NCDOT SPECIFICATIONS (2018)
	#57 STONE PER NCDOT SPECIFICATIONS (2018)

**APPROVED MASTER PLAN**  
 Town of Knightdale  
 Development Services  
 Gideon Smith 10/30/2024



60' 30' 0 60' 120'  
 1"=60'

**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Civil 3D 2022 Imperial  
 ANSIS 17 34x22  
 2/14/2022 4:09 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	25/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	SLD	
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	SLD	
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	

**BLACK & VEATCH**  
 Building a world of difference

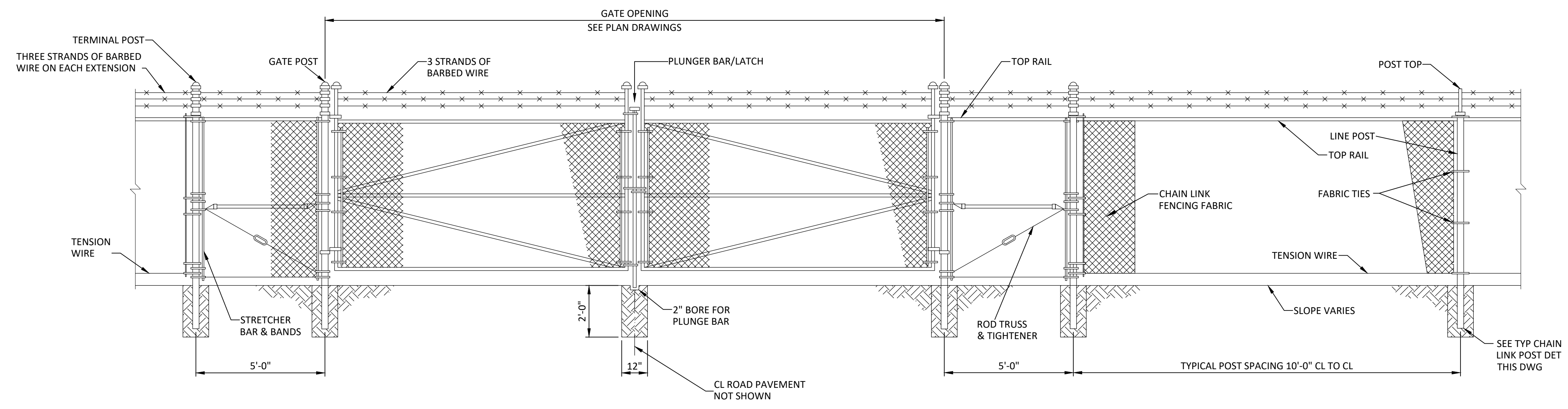
DESIGNER: MJM DRAWN: CLC  
 CHECKED: HGU DATE: 27/SEP/24

**DUKE ENERGY**  
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

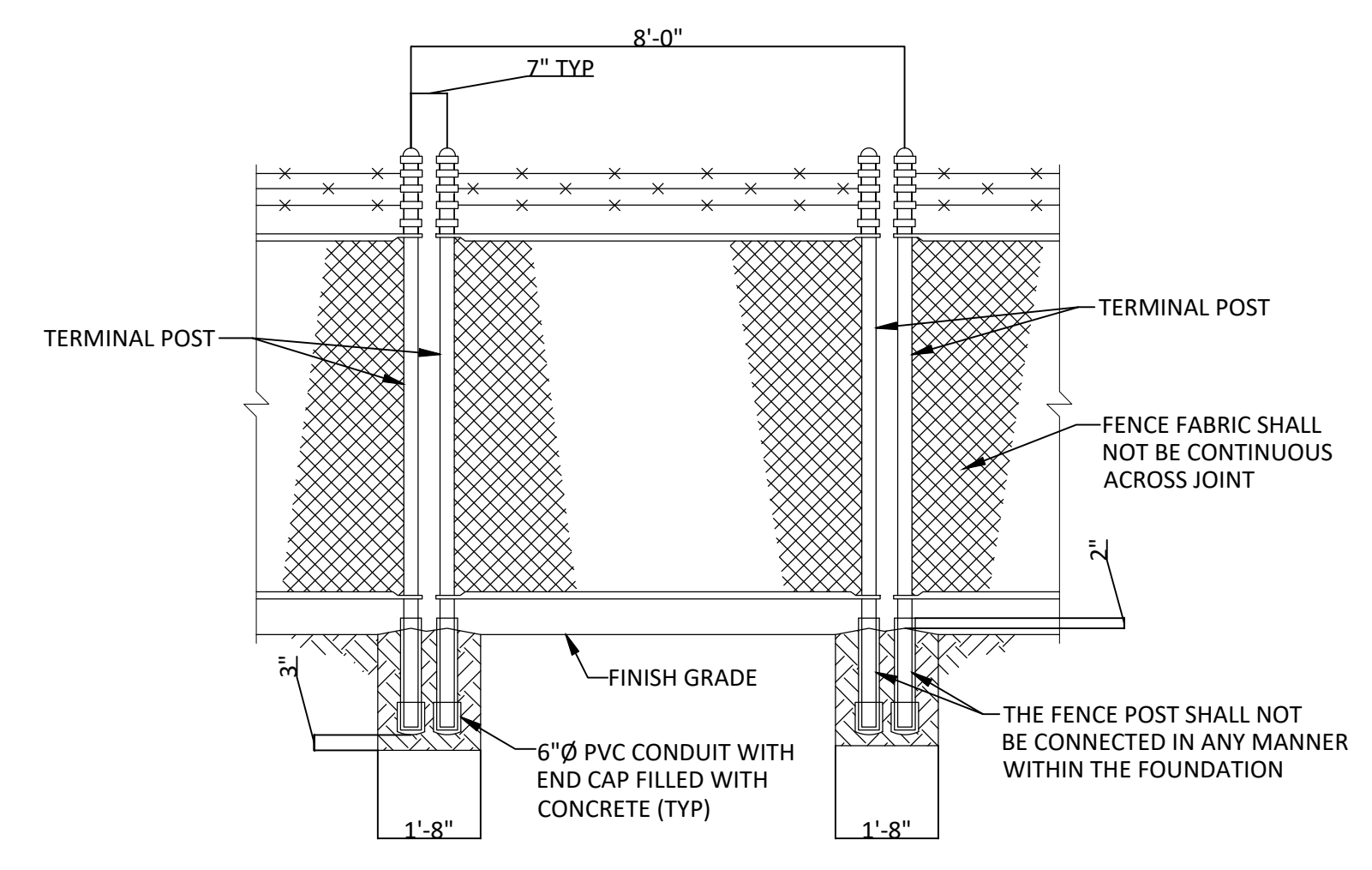
**DUKE ENERGY**  
 SURFACING AND FENCING PLAN  
 5201 KNIGHTDALE EAGLE ROCK ROAD  
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-FE.PL-01		E
CODE		
AREA		

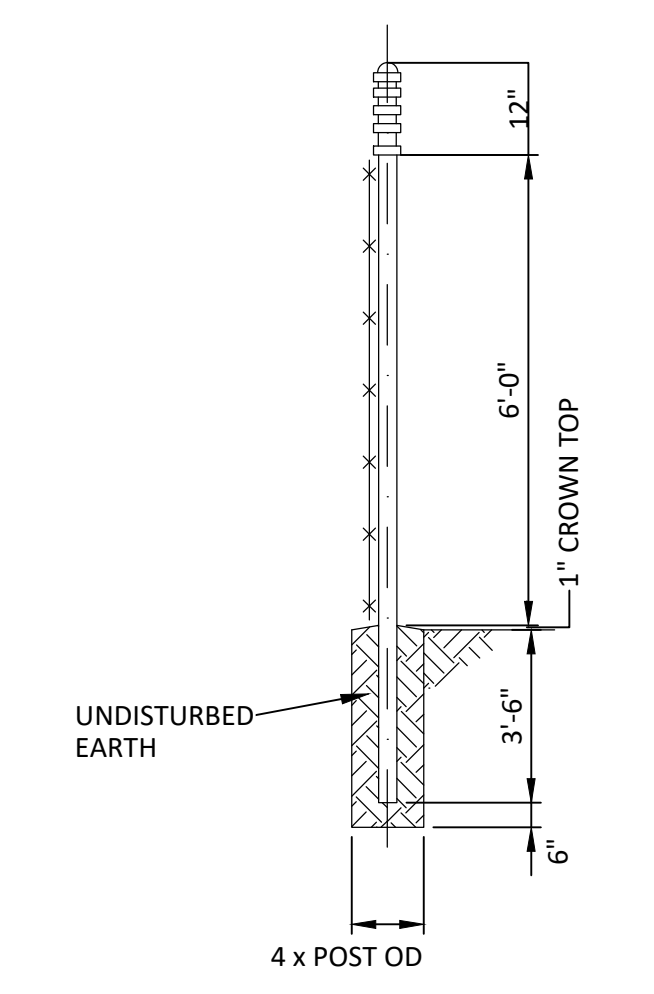




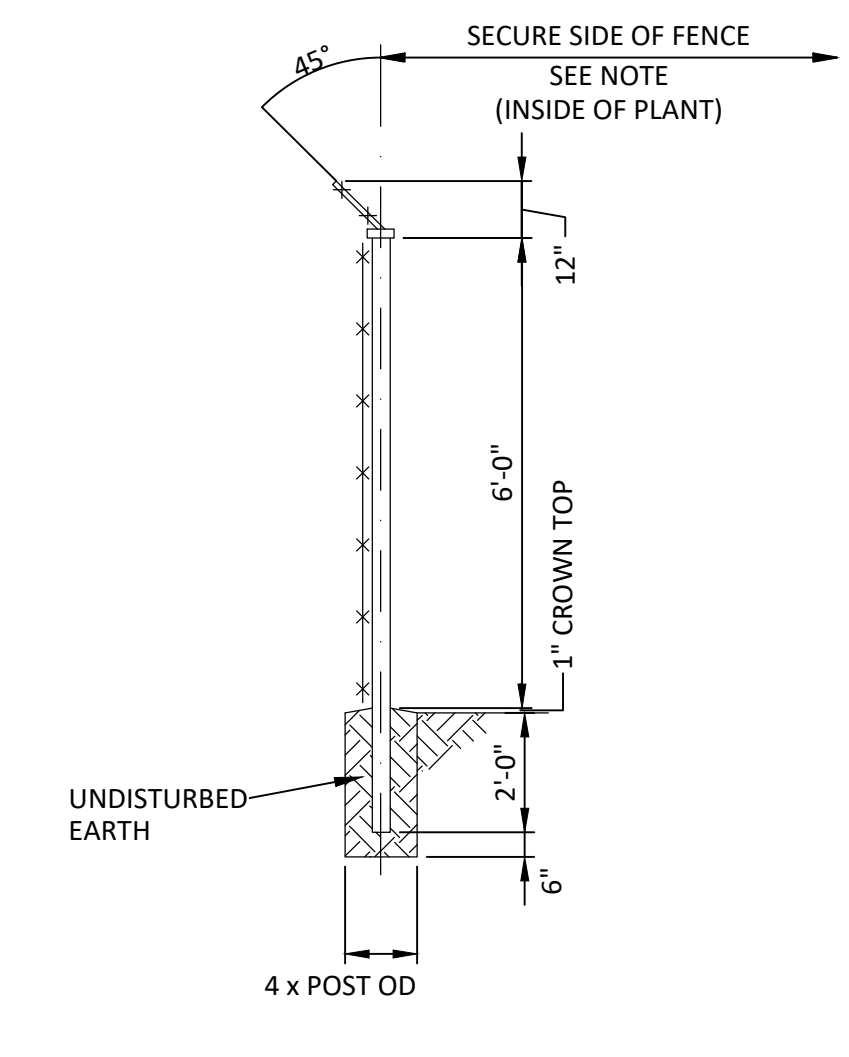
**TYPICAL CHAIN LINK SECURITY FENCE WITH SWING GATE**  
NO SCALE



**TYPICAL FENCE ISOLATION JOINT**  
NO SCALE



**TYPICAL CHAIN LINK TERMINAL, GATE, END AND CORNER POST**  
NO SCALE



**TYPICAL CHAIN LINK LINE POST**  
NO SCALE

NOTE:  
BARBED WIRE OR CHAIN LINK FENCES ARE RESTRICTED TO THE REAR YARD, SHALL NOT BE VISIBLE FROM A STREET RIGHT-OF-WAY, AND SHALL NOT BE ADJACENT TO ANY LOT IN OR ZONED FOR RESIDENTIAL USE PER SECTION 7.6.C OF THE UDO.



**ISSUED FOR PERMITTING**  
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Cop113378  
ANSI D 34x22  
2/14/2022 4:09 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
B	27/SEP/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	DSL	DSLD
A	23/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	DSL	-

**BLACK & VEATCH**  
Building a world of difference®

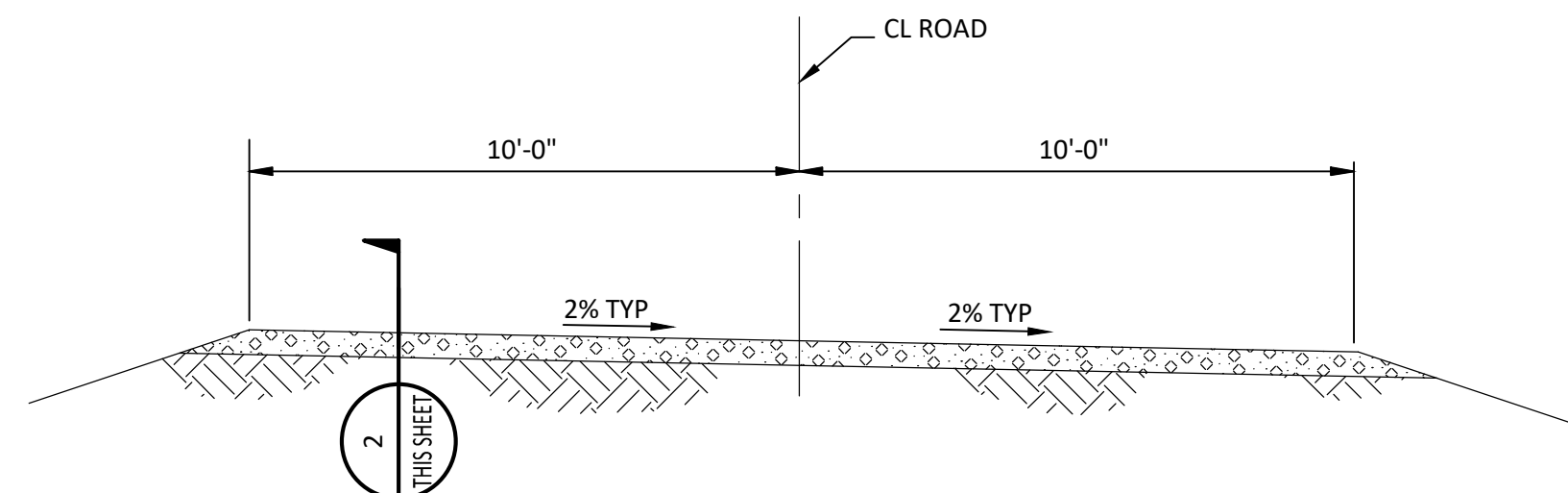
DESIGNER: MJM  
DRAWN: CLC  
CHECKED: HGU  
DATE: 27/SEP/2024

**DUKE ENERGY**  
KIGHTDALE BATTERY ENERGY STORAGE SYSTEM

FENCING DETAILS  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

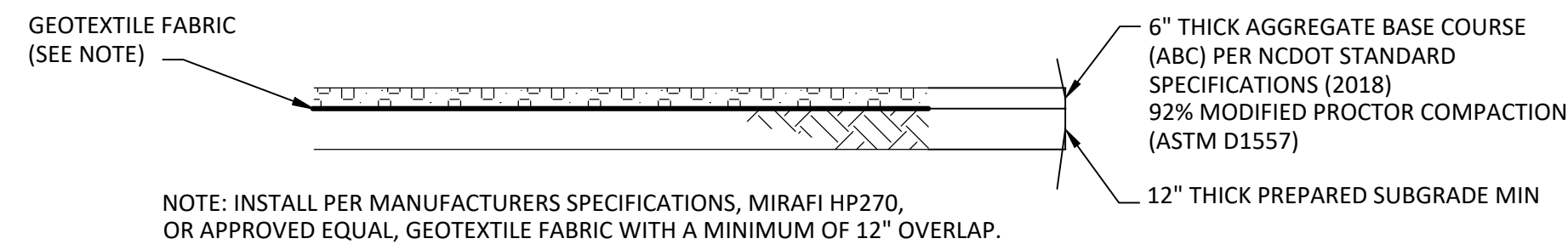
PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-ECDS-01		B
CODE	AREA	
-	-	



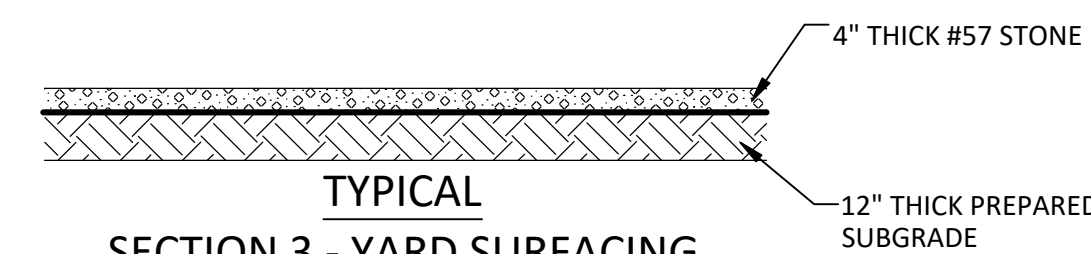


**SECTION 1 - TRANSVERSE AGGREGATE SURFACE ROAD SECTION**  
NO SCALE

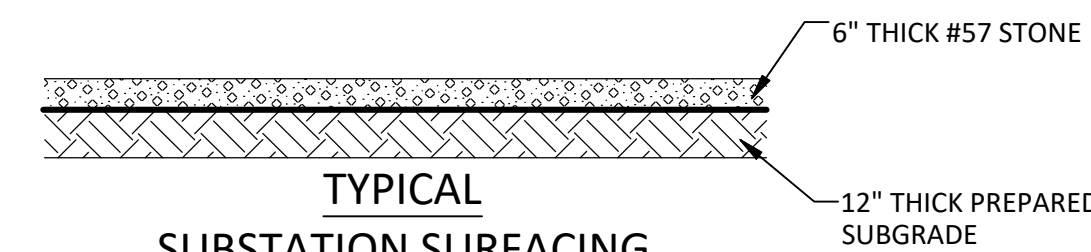
RIPRAP SCHEDULE							
OUTLET	SHEET	L (FT)	T (FT)	W1 (FT)	W2 (FT)	D50 (FT)	REMARKS
BASIN OUTFALL	GR.PL-02	14	0.5	4.5	16.0	0.50	
SWALE 1	GR.PL-01	8	0.5	3.0	9.0	5	
SWALE 2	GR.PL-02	14	0.5	4.0	16.0	0.5	



**SECTION 2**  
SEE THIS DWG  
NO SCALE

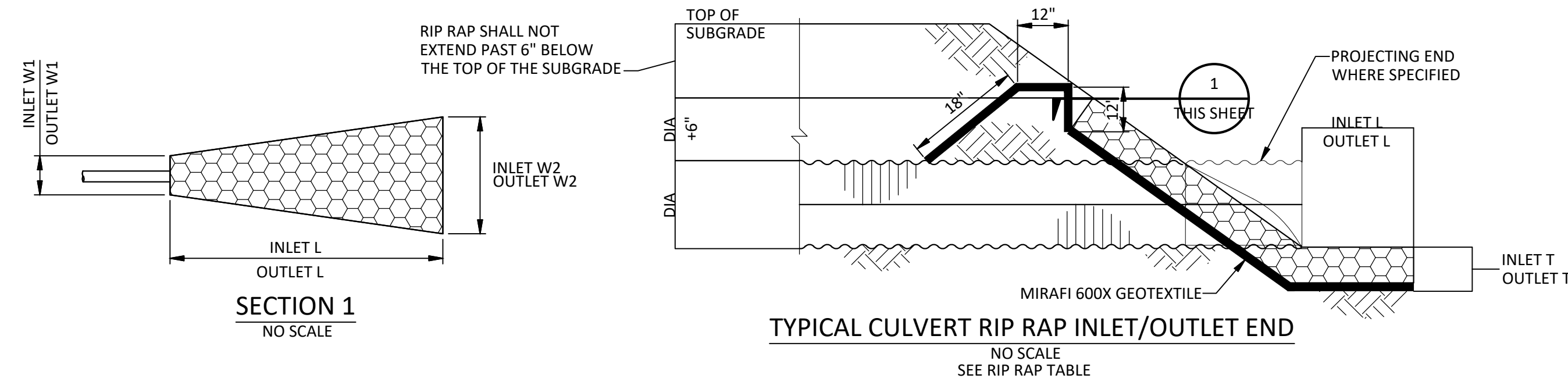


**TYPICAL SECTION 3 - YARD SURFACING**  
SEE THIS DWG  
NO SCALE



**TYPICAL SUBSTATION SURFACING**  
SEE THIS DWG  
NO SCALE

DITCH NO.	COORDINATES				LENGTH (FT)	START INV ELV	END INV ELV	SLOPE (FT/FT)	LINING	DESIGN LIFE	REMARKS
	START		END								
	NORTHING	EASTING	NORTHING	EASTING							
S-1	741373.79	2161398.82	741481.42	2161843.09	518	327.15	319.19	VARIES		PERMANENT	OFFSITE DIVERSION
S-2	741336.08	2161426.57	740448.39	2161516.95	916	317.17	313.17	0.005	GRASS	PERMANENT	OFFSITE DIVERSION
S-3	741469.83	2161766.32	740851.99	2161706.11	736	320.67	305.46	0.005	GRASS	PERMANENT	CONVEYANCE
S-4A	740495.88	2161719.25	740649.74	2161713.76	110	316.20	315.82	0.003	GRASS	PERMANENT	CONVEYANCE
S-4B	740497.37	2161730.03	740650.30	2161739.52	44	311.87	305.38	0.237	RIPRAP	PERMANENT	CONVEYANCE
D-1	741471.43	2161846.77	740863.24	2161711.88	763	318.00	305.38	0.010	EC BLANKET	TEMPORARY	CONVEYANCE
D-2	740415.74	2161746.18	740204.10	2161744.09	212	309.00	303.00	0.005	EC BLANKET	TEMPORARY	OFFSITE DIVERSION



**APPROVED MASTER PLAN**  
Town of Knightdale  
Development Services  
Gideon Smith 10/30/2024

**ISSUED FOR PERMITTING**  
THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Civil 3D 2022 Imperial  
ANSI D 34x22  
2/14/2022 4:09 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	25/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SD	LD
C	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SD	LD
B	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	SD	LD
A	22/AUG/2024	ISSUED FOR PERMIT	CLC	MJM	HGU	SD	LD

**BLACK & VEATCH**  
Building a world of difference®

DESIGNER: MJM, DRAWN: CLC  
CHECKED: HGU, DATE: 27/SEP/2024

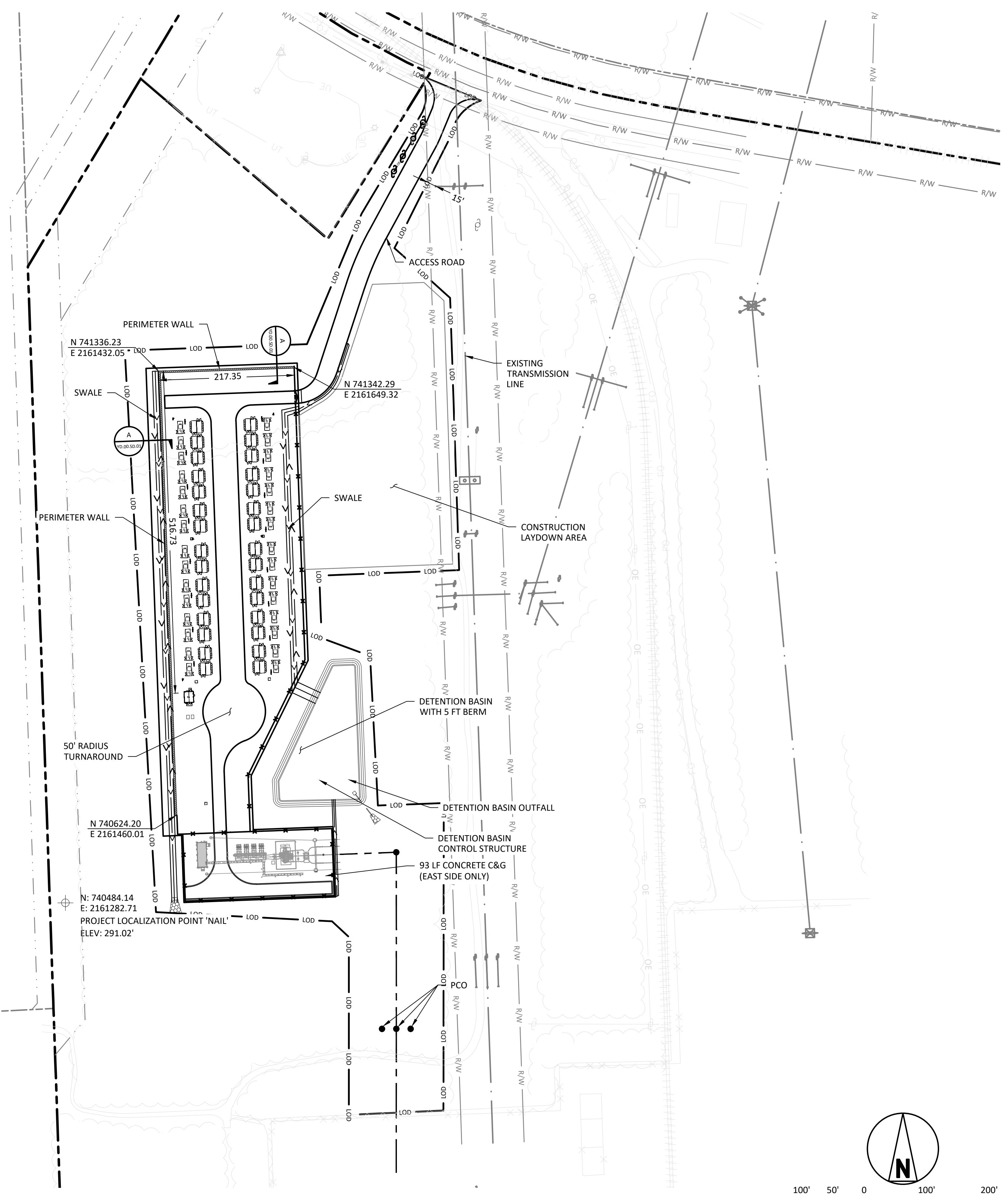
**DUKE ENERGY**  
KNIGHTDALE BATTERY ENERGY STORAGE FACILITY

SURFACING DETAILS  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
KND01-CV-C-GR.SD-01		E
CODE	AREA	



A  
B  
C  
D  
E  
F



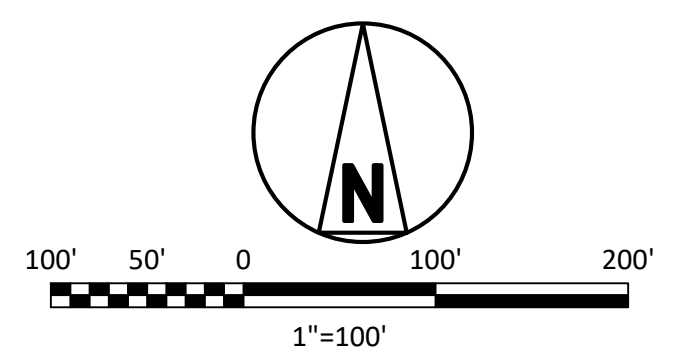
**LEGEND**

	ADJACENT PARCEL BOUNDARY
	PROPOSED SECURITY FENCE
	EXISTING FENCE
	PROPOSED ROAD
	EXISTING TREE LIMITS
	EXISTING RAILROAD
	EXISTING OVERHEAD LINE
	PROPERTY BOUNDARY
	PROPOSED OVERHEAD ELECTRIC LINES
	EXISTING RIGHT-OF-WAY
	EXISTING FIBER OPTIC CABLE
	LIMITS OF DISTURBANCE
	EXISTING TREE LINE
	PERIMETER WALL
	PROPOSED UNDERGROUND ELECTRIC LINES
	RIGHT OF WAY

HORIZONTAL DATUM: NAD83 NORTH CAROLINA STATE PLANES, US FOOT  
 \*STATE PLANE COORDINATES WERE ESTABLISHED BASED IN NGS MONUMENTS "ROSE" AND "TOMB".

VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988

BENCHMARK: PROJECT LOCALIZATION POINT 'NAIL'  
 N: 740,484.141'  
 E: 2,163,003.135'  
 ELV: 291.02'



**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Civil 3D 2022 Imperial  
 ANS I D 344-2  
 8/15/2024 7:29 AM

NO	DATE	REVISIONS AND RECORD OF ISSUE
C	25/OCT/2024	ISSUED FOR PERMITTING
B	27/SEP/2024	ISSUED FOR PERMITTING
A	26/AUG/2024	ISSUED FOR PERMITTING

CLC	DSD	HGU	DSD				
CLC	DSD	HGU	DSD				
DRN	DES	CHK	PDE	APP			

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_ REG. NO. \_\_\_\_\_

**BLACK & VEATCH**  
 Building a world of difference®

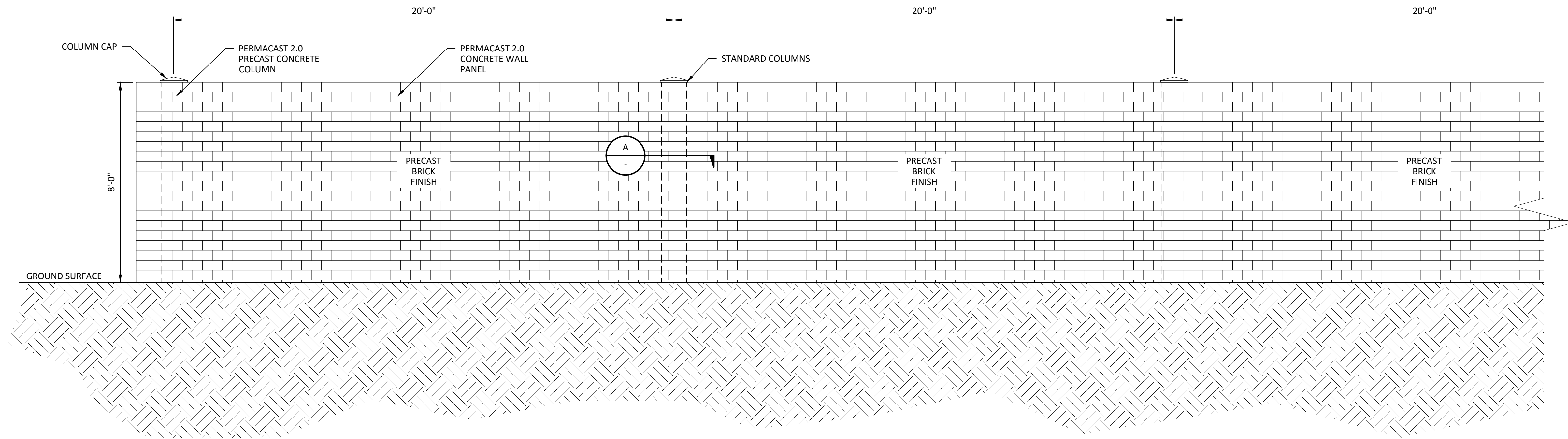
DESIGNER: \_\_\_\_\_ DRAWN: CLC  
 CHECKED: DSD DATE: 26/AUGUST/24

**DUKE ENERGY**  
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

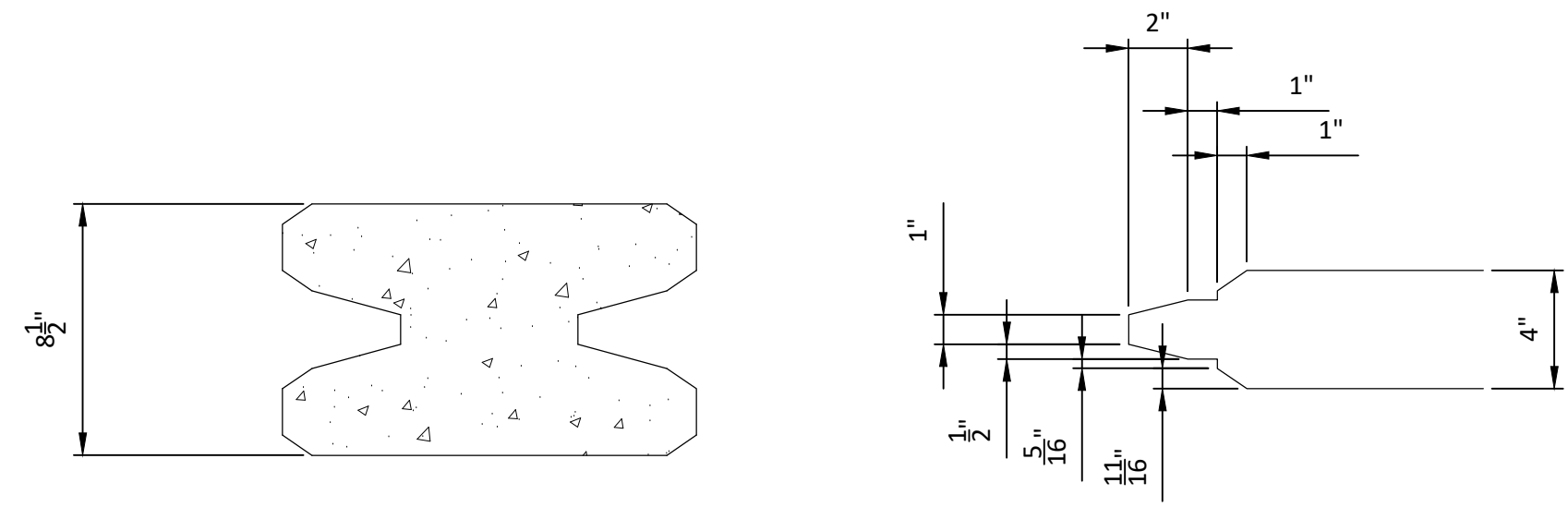
ARCHITECTURAL PLAN  
 5201 KNIGHTDALE EAGLE ROCK ROAD  
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-AD-A-YD.00.PL-01	C	
CODE	AREA	

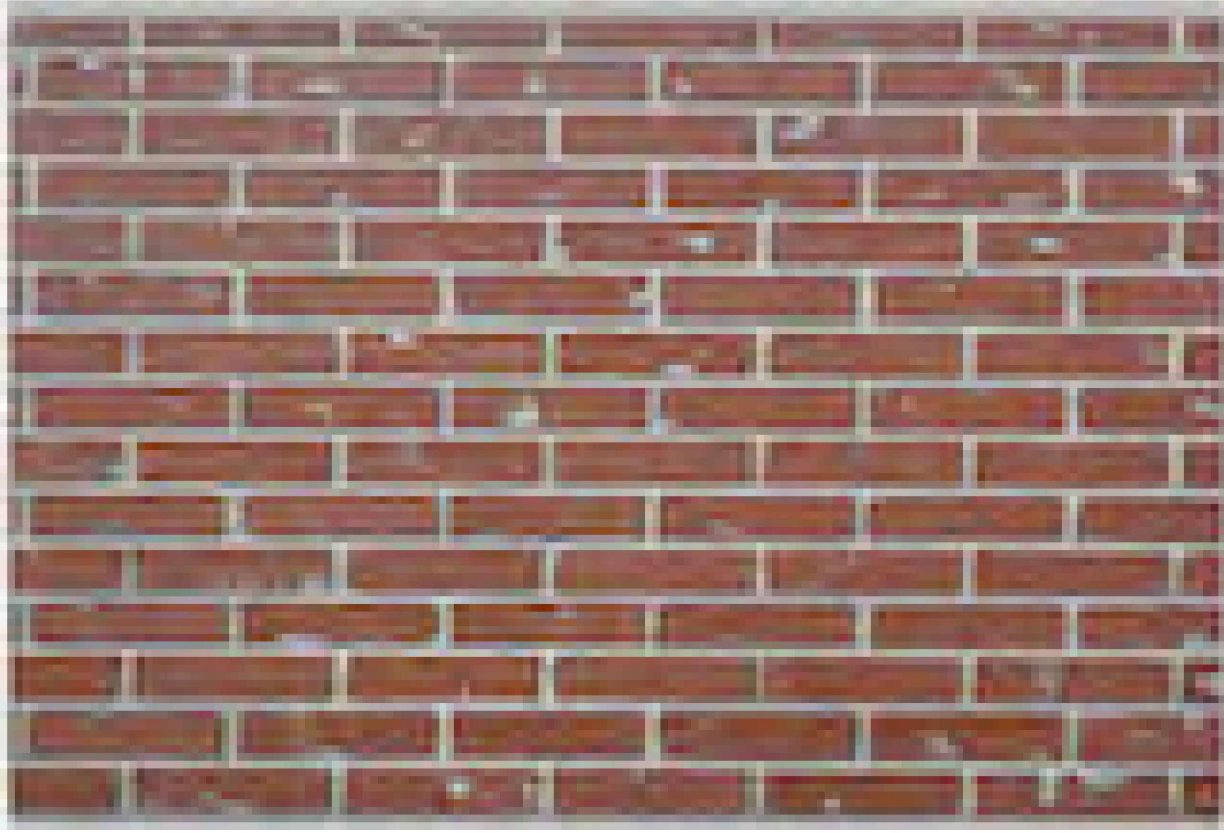




ELEVATION A - TYPICAL 8 FT. X 20 FT WALL ELEVATION  
SCALE: 1" = 30'-0"



SECTION A  
TYPICAL PANEL / POST CONNECTION  
SCALE: 1" = 6"



BRICK FINISH

**APPROVED MASTER PLAN**  
Town of Knightdale  
Development Services  
Gideon Smith 10/30/2024

**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Vas68718  
ANSI D 344-22  
9/15/2024 7:29 AM  
Civil 3D 2022 Imperial  
Full Size 1=1

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
B	27/SEP/2024	ISSUED FOR PERMITTING	CLC	DSD	HGU	DSD	
A	26/AUG/2024	ISSUED FOR PERMITTING	DCV	DCV	DSD	DSD	

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF \_\_\_\_\_  
SIGNED \_\_\_\_\_  
DATE \_\_\_\_\_ REG. NO. \_\_\_\_\_

**BLACK & VEATCH**  
Building a world of difference®

DESIGNER: \_\_\_\_\_ DRAWN: DCV  
CHECKED: HGU DATE: 27/SEP/2024

**DUKE ENERGY**  
DUKE ENERGY  
KNIGHTDALE EPC

ARCHITECTURAL ELEVATION AND SECTIONS  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-AD-A-YD.00.SD-01		B
CODE	AREA	

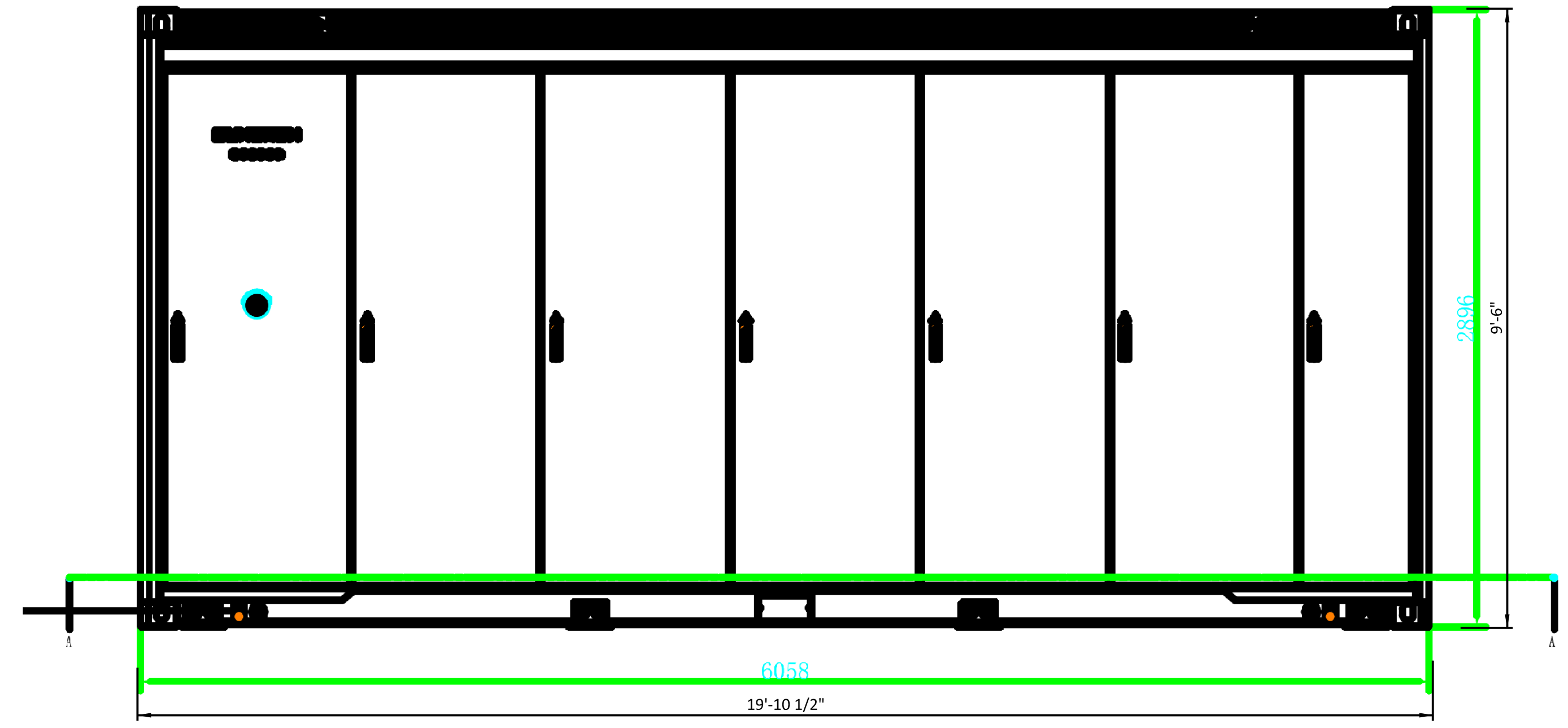


**ST5015UX-2H-US**  
**ST5015UX-4H-US**  
PowerTitan 2.0 Liquid Cooled Energy Storage System

NEW



Product name	ST5015UX-2H-US	ST5015UX-4H-US
DC side		
Cell type	LFP	
Battery configuration	3.2 V / 314 AH	
Nominal capacity	46812P	
Nominal voltage range	501S kWh	
AC side		
Nominal AC power	210 kVA * 12	210 kVA * 6
DC current distortion rate	< 3% (Nominal Power)	
DC component	< 0.5%	
Nominal AC voltage	690 V	
AC voltage range	607 V ~ 759 V	
Termination (LV)	352 A * 3 Phase * 6	352 A * 3 Phase * 3
Power factor	> 0.99 (Nominal Power)	
Adjustable range of reactive power	-100% ~ 100%	
Nominal frequency	60 Hz	
Isolation method	Transformerless	
System parameter		
Dimension (W * H * D)	6058 mm * 2896 mm * 2438 mm	
Weight	42500 kg / 93696.5 lbs	42000 kg / 92594.0 lbs
Degree of protection	Type 3S	
Anti-corrosion degree	C4	
Operation temperature range	-30 °C ~ 50 °C ( > 45 °C Derating )	
Operation humidity range	-22 °F ~ 122 °F ( > 113 °F Derating )	
Max. operation altitude	3000 m / 9842.5 ft	
Temperature control method	Intelligent Liquid Cooling	
Fire suppression system	Default: NFPA 68 compliance vent panel, smoke and heat, detectors, Mini FACP Optional: Sprinkler, sound beacon, NFPA 69, compliance ventilation system, Flammable gas detector	
Communication	Ethernet	
Standard	UL 9540A, NFPA 855, NFPA 68, NFPA 69 ( optional ) IEEE 1547, UL 1973, UL 1741SB, UL 9540	

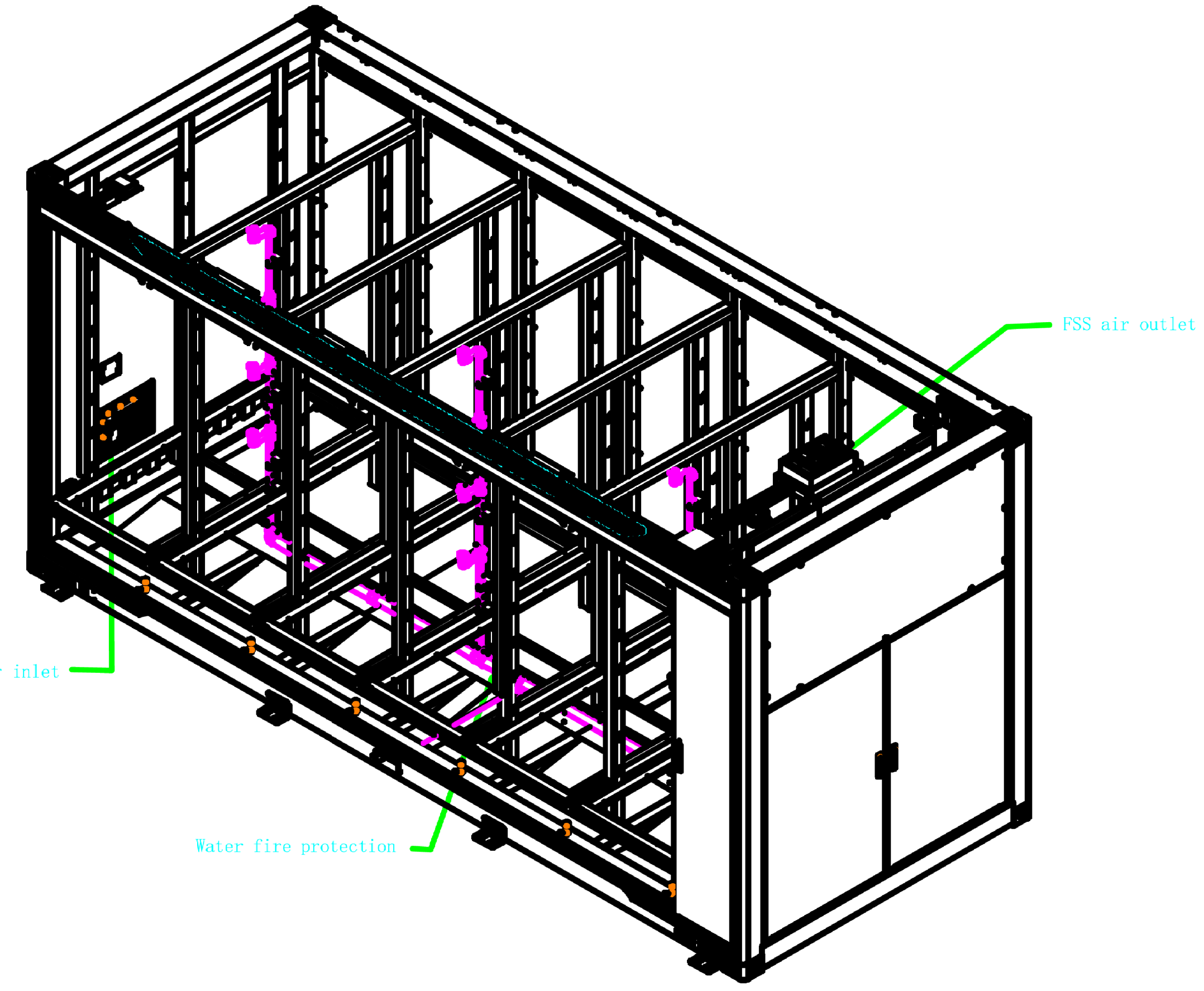


Front View

- OPTIMAL COST**
  - Intelligent liquid-cooled temperature control system to optimize the auxiliary power consumption
  - Pre-assembled, no battery module handling on site, transportation of complete system
- EFFICIENT AND FLEXIBLE**
  - High-efficiency heat dissipation, increase battery life and system discharge capacity
  - Front single-door-open design, supporting back to back layout drawing
  - Function test in factory, limited on-site work, accelerate commissioning process
- SAFE AND RELIABLE**
  - Electrical safety management, overcurrent fast breaking and arc extinguishing protection
  - The electrical cabinet and battery cabinet are separated to prevent thermal runaway
- CONVENIENT O&M**
  - One-click system upgrade
  - Automatic coolant refilling design
  - Online intelligent monitoring

© 2024 Sungrow Power Supply Co., Ltd. All rights reserved. Subject to change without notice. Version 5

© 2024 Sungrow Power Supply Co., Ltd. All rights reserved. Subject to change without notice. Version 5



**APPROVED MASTER PLAN**  
Town of Knightdale  
Development Services  
Gideon Smith 10/30/2024

**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

Ari122837  
ANSI D 3422  
8/23/2024 02:52 PM  
MicroStation v23.00.01.44  
Full Size 1 = 1

NO	DATE	ISSUED FOR PERMIT	RSN	BCA	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT	RSN	BCA	OOO	OOO	BC
REVISIONS AND RECORD OF ISSUE							
DRN	DES	CHK	PDE	APP			

**BLACK & VEATCH**  
17401 LAMAR AVENUE  
OVERLAND PARK, KANSAS 66211

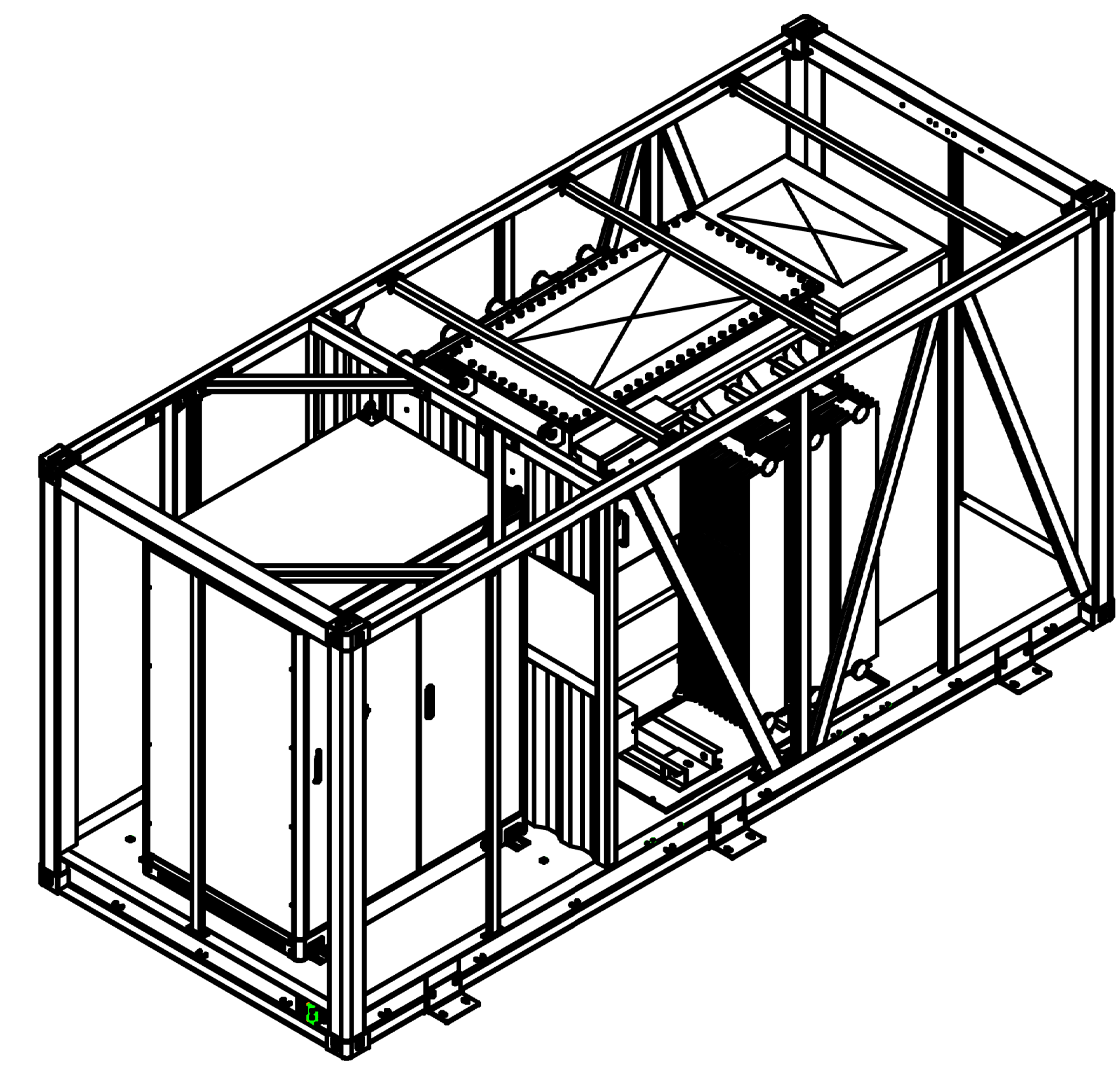
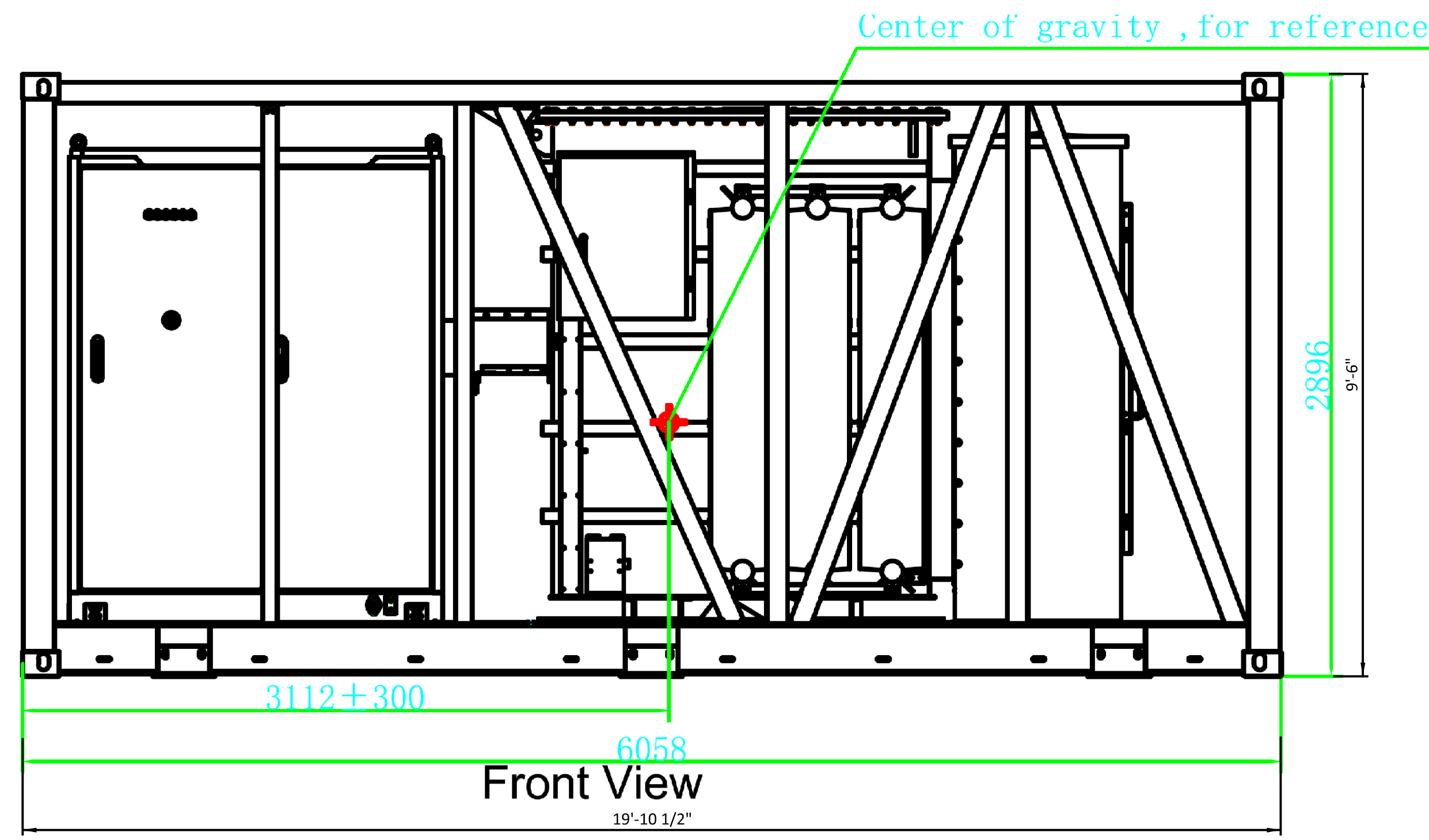
DESIGNER: BCA  
DRAWN: RSN  
CHECKED: OOO  
DATE: 23/AUG/24

**DUKE ENERGY**  
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

BESS CONTAINER ARCHITECTURAL PLAN  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
KN001-VEN-LG-E-SD-01		A
CODE	AREA	





**SUNGROW**  
Clean power for all

# MVS5140-LS-US

MV Turnkey Solution for **PowerTitan 2.0** MVS Liquid Cooling Energy Storage System

**NEW**

Product Name	MVS5140-LS-US
MV transformer	
Rated power	5140 kVA
MV / LV voltage	34.5 kV / 0.69 kV
Transformer vector	Dy1
Windings	2 windings
Rated frequency	60 Hz
Impedance	9 % ( ± 7.5 % , IEEE tolerance )
Efficiency standard	99 % @ 100 % load
Material of winding ( MV / LV )	Aluminum / Aluminum
Legged core design	3 Legged core Design
High voltage configuration	Loop-feed, Dead Front
Overcurrent protection	Expulsion fuses in series with Partial-Range Current-Limiting Fuses
Cooling method	KNAN
Insulation fluid	Degradable oil
<b>Smart control cabinet</b>	
Protection	AC Breaker
Surge protection	Type II
AC Insulation detection	Support
Cooling Method	Air cooling and HVAC
UPS	15 min ( Default ) 2 / 3 / 4 h ( Optional )
<b>General data</b>	
Dimensions ( W * H * D )	6058 mm * 2896 mm * 2438 mm 238.5" * 114.0" * 96.0"
Weight	15300 kg 33730 lbs
Cable entry	Bottom entry
Degree of protection	Type 3S
Anti-corrosion degree	C4
Operation temperature range	-40 °C ~ 60 °C -40 °F ~ 140 °F > 40 °C ( 104 °F ) derating ( Default ) > 45 °C ( 113 °F ) derating ( Optional )
Operation humidity range	0 % ~ 100 %
Max. operating altitude	3000 m 9842.5 ft
Communication	Ethernet, Optical fiber, RS485
Standard	UL 891, IEEE C57.12.00, IEEE C57.12.80, IEEE C57.12.90

\* 15min UPS only supplies power for the control and communication devices in the MVS  
 \*\* 2/3/4 h UPS supplies power for the control and communication devices in the the MVS, and the ventilation system in the battery container

© 2024 Sungrow Power Supply Co., Ltd. All rights reserved. Subject to change without notice. Version 1

**APPROVED MASTER PLAN**  
Town of Knightdale  
Development Services  
Gideon Smith 10/30/2024

**ISSUED FOR PERMITTING**  
THE DISTRIBUTION AND USE OF THE NATIVE  
FORMAT CAD FILE OF THIS DRAWING IS  
UNCONTROLLED. THE USER SHALL VERIFY  
TRACEABILITY OF THIS DRAWING TO THE LATEST  
CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

Ari122837  
ANSI D 34622  
08/23/2024 02:52 PM  
MicroStation v23.00.01.44  
Full Size 1 = 1

NO	DATE	ISSUED FOR PERMIT	RSN	BCA	OOO	OOO	BC
A	23/AUG/24	ISSUED FOR PERMIT	RSN	BCA	OOO	OOO	BC
REVISIONS AND RECORD OF ISSUE							
DRN	DES	CHK	PDE	APP			

**BLACK & VEATCH**  
17401 LAMAR AVENUE  
OVERLAND PARK, KANSAS 66211

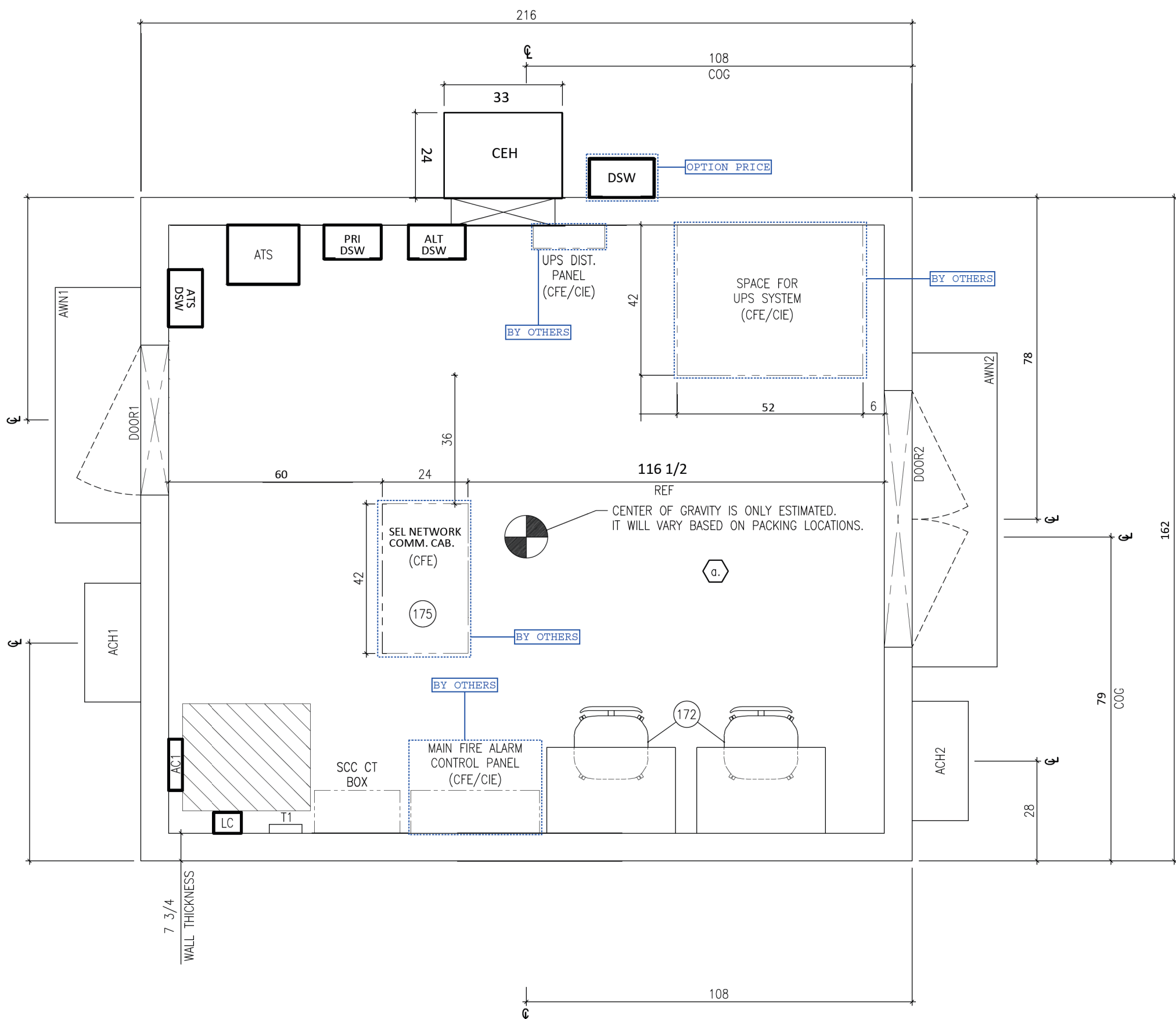
DESIGNER: BCA  
DRAWN: RSN  
CHECKED: OOO  
DATE: 23/AUG/24

**DUKE ENERGY**  
MVT SKID LAYOUT

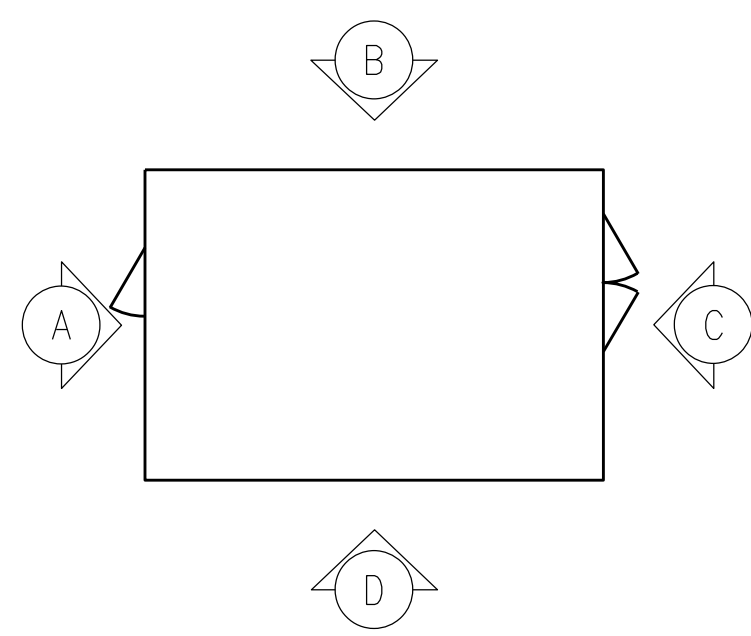
MVT SKID ARCHITECTURAL PLAN  
5201 KNIGHTDALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
KND01-VEN-LG-E-SD-02		A
CODE	AREA	

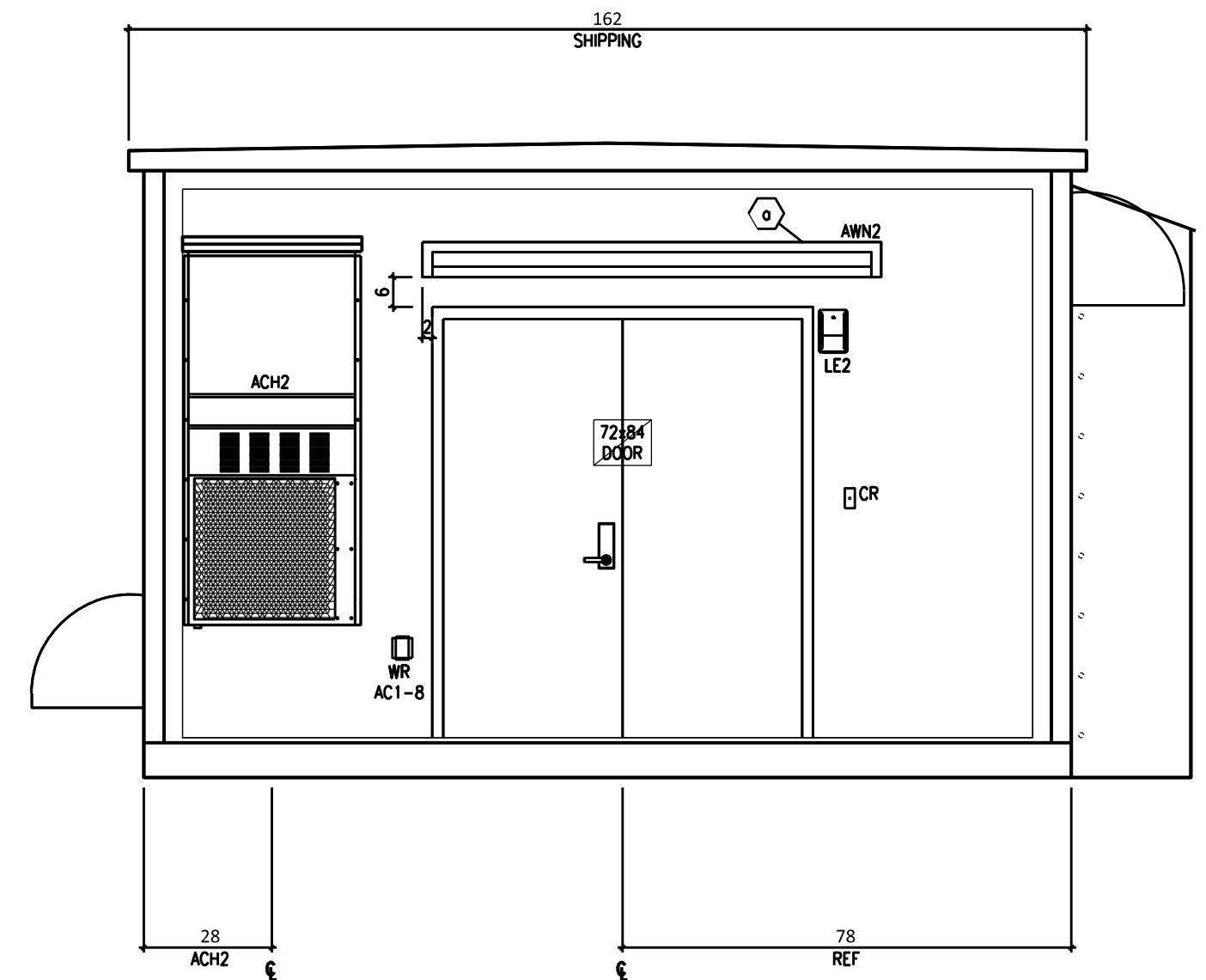




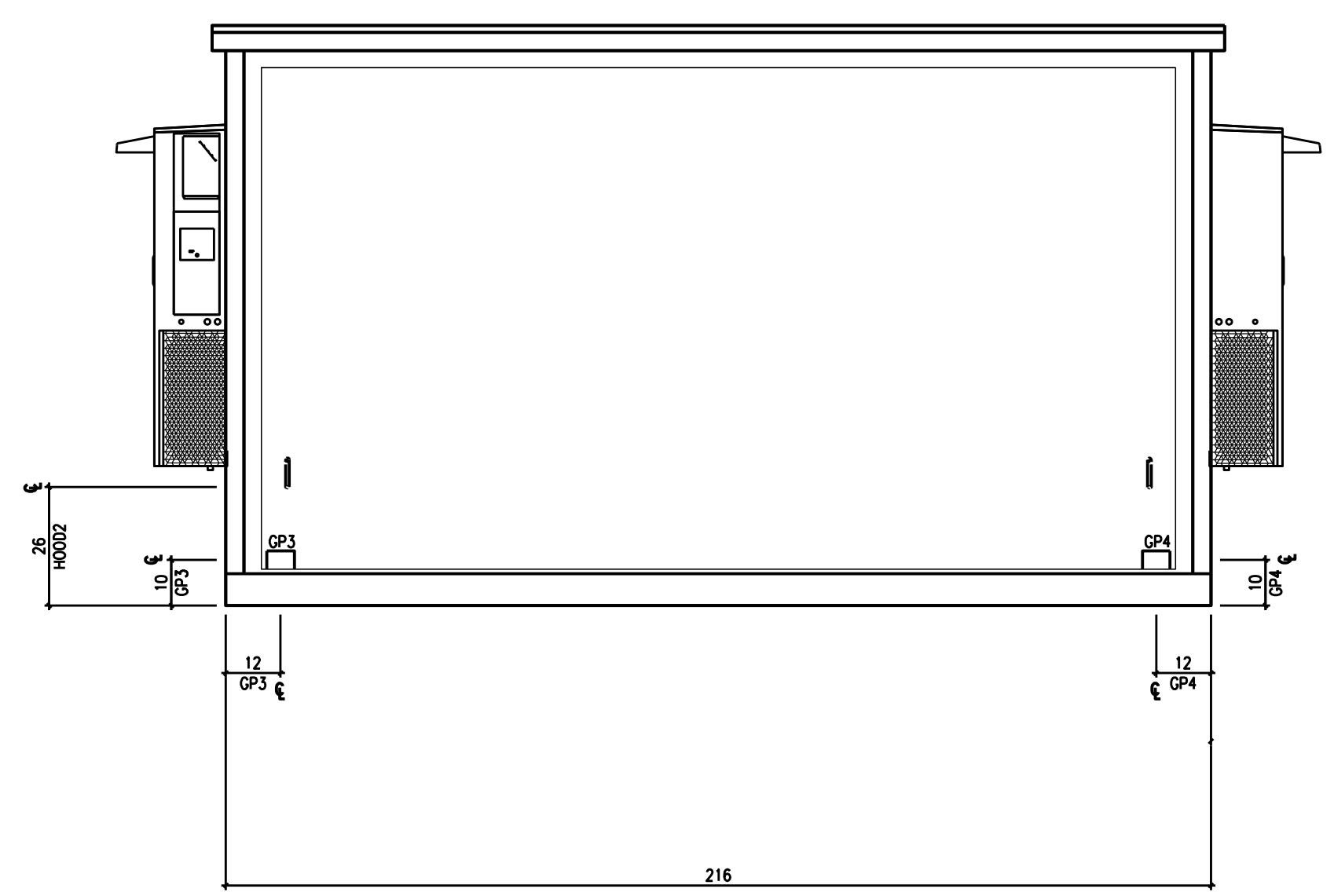
PLAN VIEW



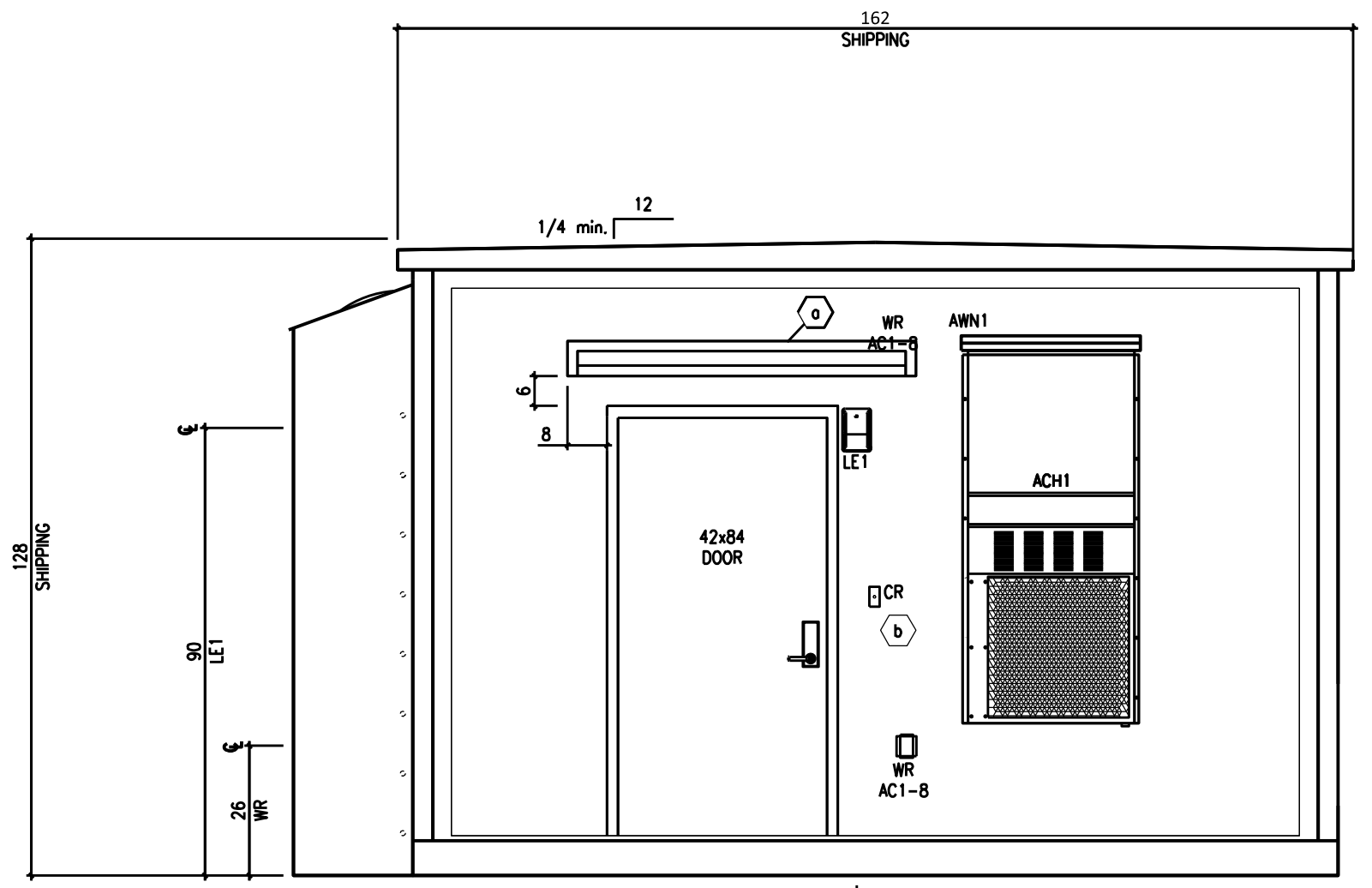
ELEVATION KEY



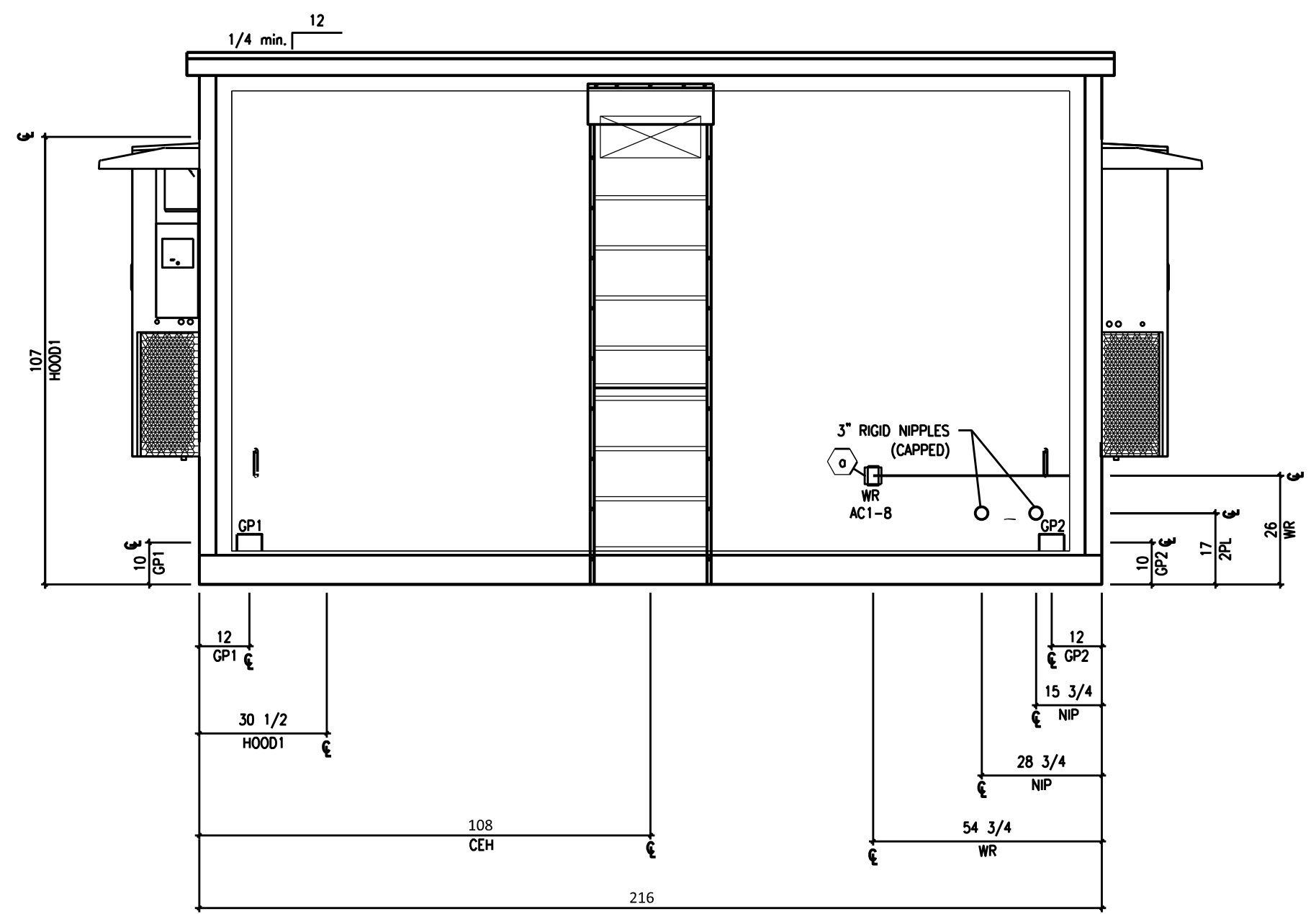
ELEVATION C



ELEVATION D



ELEVATION A



ELEVATION B



**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

A1122837  
 ANXD 34622  
 08/23/2024 02:52 PM  
 MicroStation v23.00.01.44  
 Full Size 1 = 1

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
A	23/AUG/24	ISSUED FOR PERMIT	RSN	BCA	OOO	OOO	BC

<b>BLACK &amp; VEATCH</b>		<b>DUKE ENERGY</b>	
DESIGNER	BCA	DRAWN	RSN
CHECKED	OOO	DATE	23/AUG/24

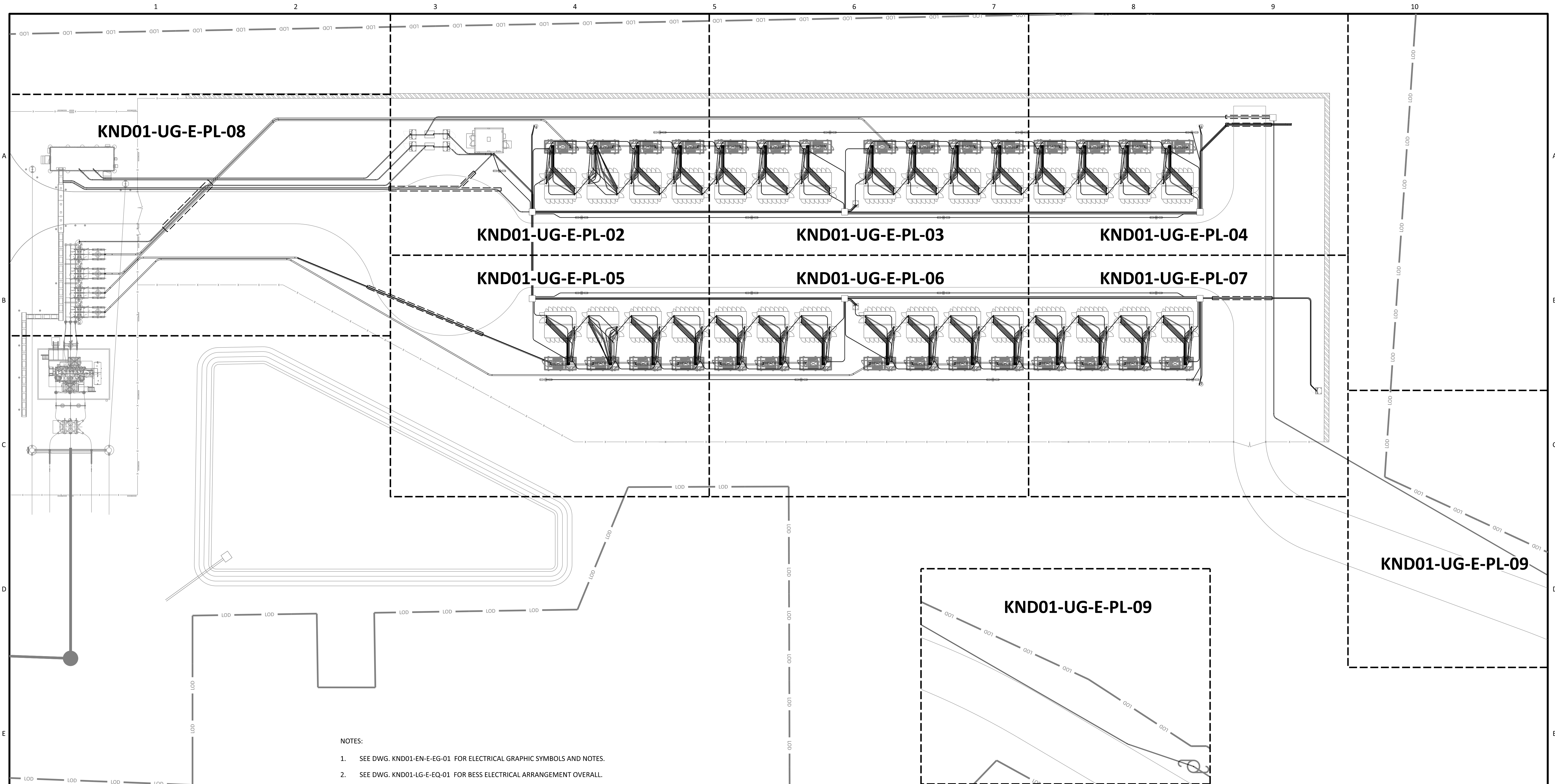
<b>DUKE ENERGY</b>	
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM	
SITE CONTROL CENTER ARCHITECTURAL PLAN	
5201 KNIGHTDALE EAGLE ROCK ROAD	
KNIGHTDALE, NC 27545	

PROJECT	DRAWING NUMBER	REV
KND01-VEN-LG-E-AE.00.SD-03	A	
CODE	AREA	

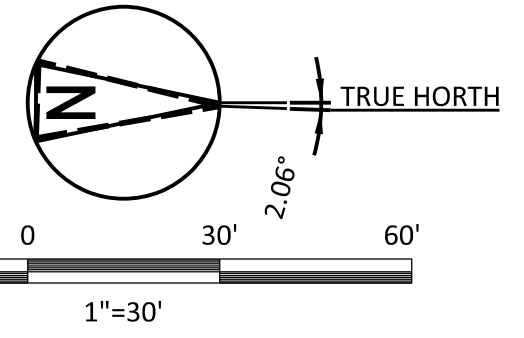








- NOTES:
- SEE DWG. KND01-EN-E-EG-01 FOR ELECTRICAL GRAPHIC SYMBOLS AND NOTES.
  - SEE DWG. KND01-LG-E-EQ-01 FOR BESS ELECTRICAL ARRANGEMENT OVERALL.
  - SEE DWG. KND01-GD-E-PL-01 FOR GROUNDING BESS PLANT OVERALL.
  - SEE DWG. KND01-CV-C-FD-XX FOR EQUIPMENT FOUNDATION PLAN AND DETAILS.
  - ALL CONDUITS CROSSING THE ROADWAY SHALL BE COVERED IN CONCRETE PRIOR TO BACKFILL. CONCRETE ENCASEMENT SHALL EXTEND 5' FROM EACH SIDE OF THE ROAD AND INCLUDE THE WIDTH OF THE TRENCH.
  - POLYWATER J LUBRICANT SHALL BE USED FOR ALL MEDIUM VOLTAGE CABLE PULL WITHIN UNDERGROUND CONDUITS.



**APPROVED MASTER PLAN**  
 Town of Knightdale  
 Development Services  
 Gideon Smith 10/30/2024

**ISSUED FOR PERMITTING**  
 THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

B&V PROJECT NUMBER: 419596

sat41115  
 ANGD 34622  
 09/23/2024 01:04 PM  
 MicroStation v23.00.01.44  
 Full Size 1 = 1

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
C	25/OCT/24	ISSUED FOR PERMIT	RSN	RSN	000	000	BC
B	03/SEP/24	ISSUED FOR CLIENT 60% REVIEW	RSN	RSN	000	000	BC
A	23/AUG/24	ISSUED FOR PERMIT	RSN	RSN	000	000	BC

I HEREBY CERTIFY THAT THIS DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF NORTH CAROLINA

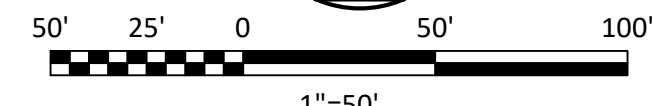
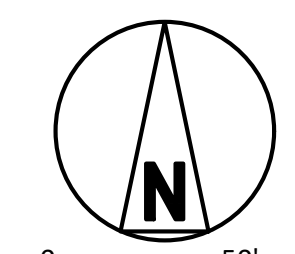
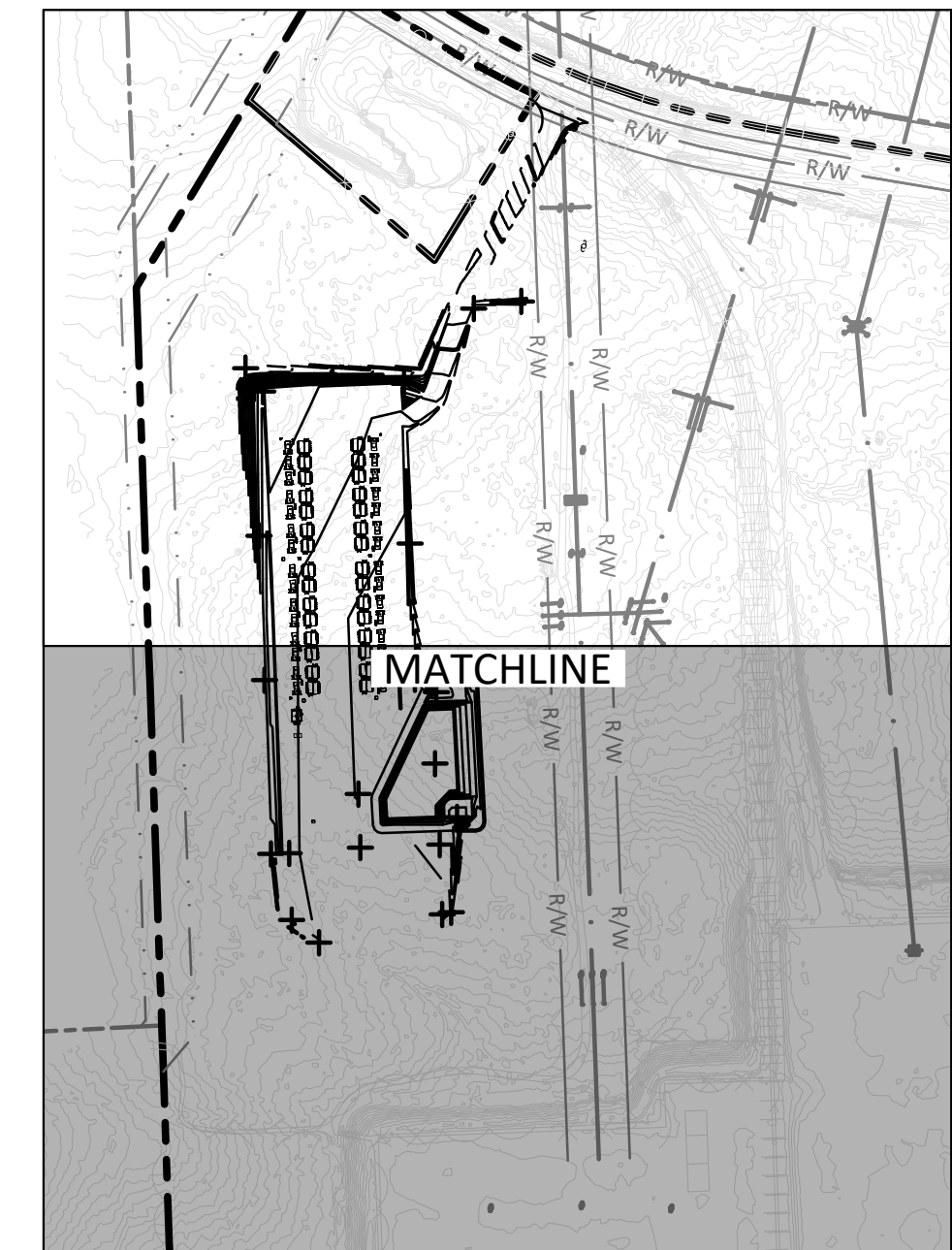
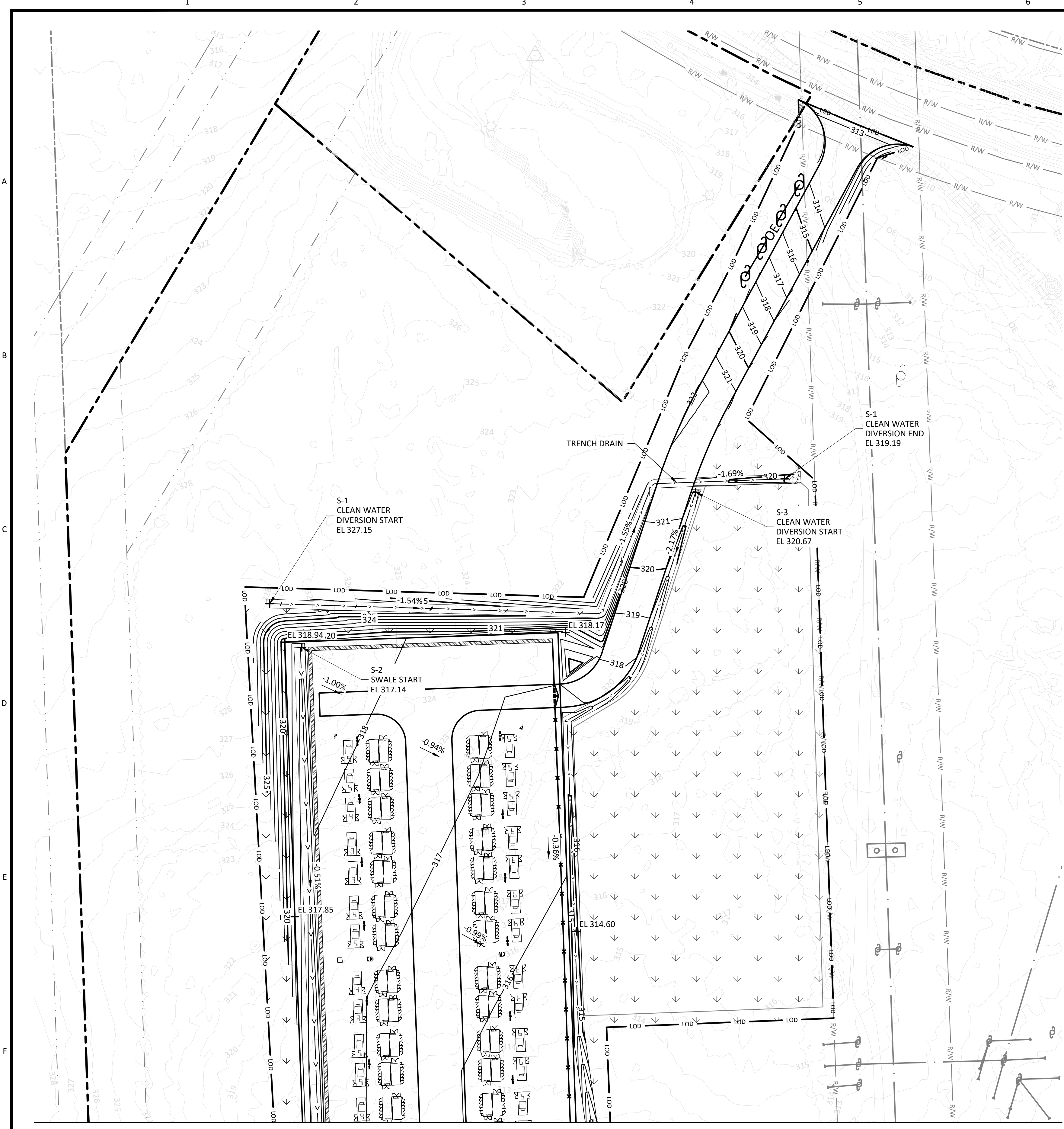
SIGNED \_\_\_\_\_ DATE \_\_\_\_\_ REG. NO. \_\_\_\_\_

<b>BLACK &amp; VEATCH</b>		<b>DUKE ENERGY</b>	
DESIGNER	RSN	DRAWN	RSN
CHECKED	000	DATE	03/SEP/24

**DUKE ENERGY**  
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM  
 ELECTRICAL UNDERGROUND CONDUIT  
 BESS OVERALL

PROJECT	DRAWING NUMBER	REV
KND01-UG-E-PL-01	KND01-UG-E-PL-01	C
CODE	AREA	





NOTES

LEGEND

- ADJACENT PARCEL BOUNDARY
- PROPOSED SECURITY FENCE
- EXISTING FENCE
- PROPOSED ROAD
- EXISTING TREE LIMITS
- EXISTING RAILROAD
- EXISTING OVERHEAD LINE
- PROPERTY BOUNDARY
- PROPOSED OVERHEAD ELECTRIC LINES
- HIGH POWERED OVERHEAD ELECTRIC LINES
- EXISTING RIGHT-OF-WAY
- EXISTING FIBER OPTIC CABLE
- LIMITS OF DISTURBANCE
- EXISTING TREE LINE
- PROPOSED PERIMETER WALL
- PROPOSED VEGETATED SWALE
- EXISTING MINOR CONTOUR LINES
- EXISTING MAJOR CONTOUR LINES
- MINOR CONTOUR LINES
- MAJOR CONTOUR LINES
- RIP RAP

**APPROVED MASTER PLAN**  
 Town of Knightdale  
 Development Services  
 Gideon Smith 10/30/2024

**NOT TO BE USED FOR CONSTRUCTION**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Civil 3D 2022 Imperial  
 Full Size 1=1  
 2/14/2022 4:09 PM  
 Cam128649  
 ANS1 D 34x22

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN DES CHK PDE APP
C	25/OCT/2024	ISSUED FOR PERMITTING	CLC MJM HGU DSLD
B	30/AUG/2024	ISSUED FOR 60% REVIEW	CLC MJM HGU DSLD
A	22/AUG/2024	ISSUED FOR PERMIT	CLC MJM HGU DSLD

**BLACK & VEATCH**  
Building a world of difference®

DESIGNER: MJM    DRAWN: CLC  
 CHECKED: HGU    DATE: 22/AUG/24

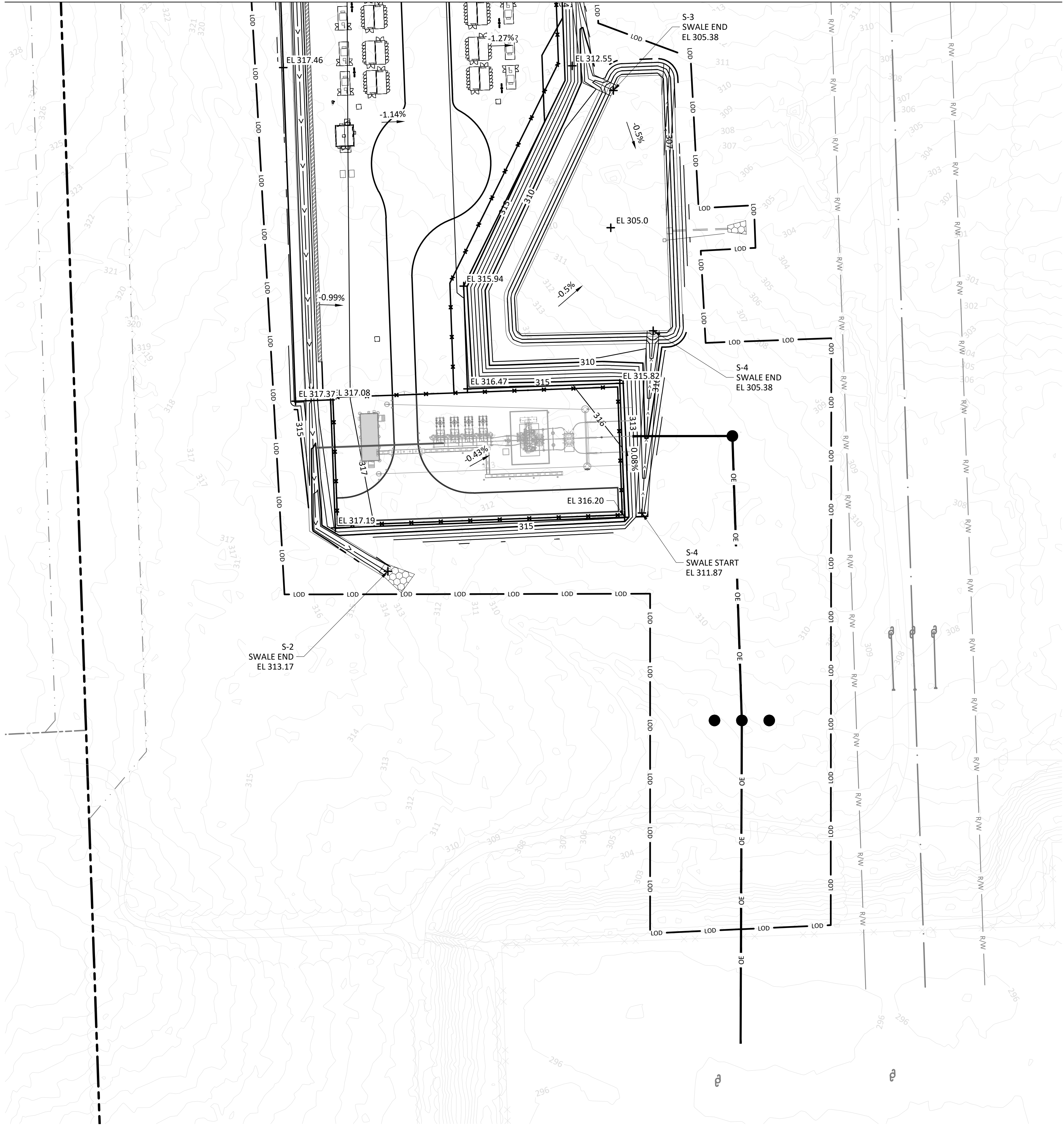
**DUKE ENERGY**    DUKE KNIGHTDALE EPC  
KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

**STORMWATER MANAGEMENT PLAN**  
5201 KNIGHTALE EAGLE ROCK ROAD  
KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
	419596 KND01-CV-C-GR.PL-01	C
CODE		
AREA		



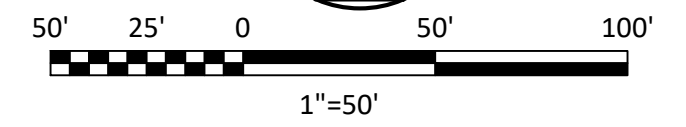
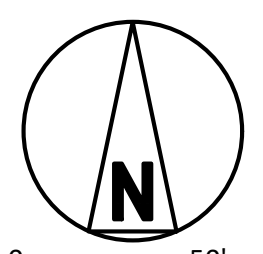
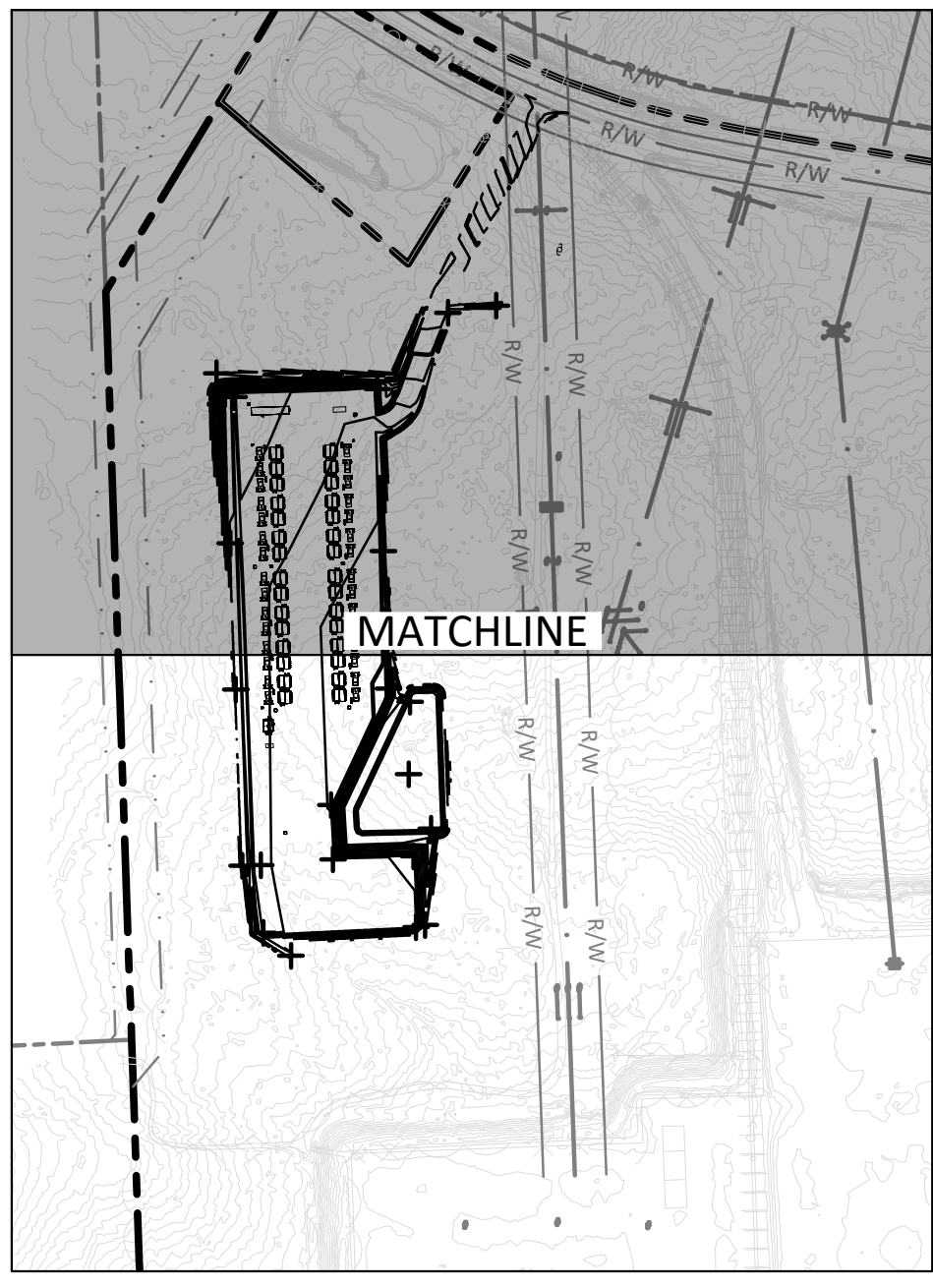
MATCHLINE



**APPROVED MASTER PLAN**  
 Town of Knightdale  
 Development Services  
 Gideon Smith 10/30/2024

- NOTES**
- SPOT ELEVATIONS AND CONTOURS ON THESE DRAWINGS ARE TOP OF FINAL SURFACE GRADE (SEE TYPICAL AGGREGATE SURFACING SECTIONS ON KND01-CV-C-GR.SD-01). SUBTRACT AGGREGATE SURFACING THICKNESS TO OBTAIN TOP OF CONSTRUCTION WORKING SURFACE AND TOP OF SUBGRADE.
  - GRADE PLANS SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLANS.
  - UNLESS NOTED OTHERWISE, SLOPES SHALL BE 3:1 (H:V).
  - SLOPE GRADE TO DRAIN IN DIRECTION OF FLOW ARROWS.
  - PERFORM FIELD IN-PLACE DENSITY TESTS ACCORDING TO ASTM D695 (NUCLEAR METHOD), 98% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR STRUCTURAL/SUBBASE AND BASE BACKFILL, 95% STANDARD PROCTOR MAXIMUM DRY DENSITY FOR NON-STRUCTURAL/ON-SITE FILL MATERIAL BACKFILL.
  - PREVENT SURFACE WATER AND SUBSURFACE OR GROUNDWATER FROM ENTERING EXCAVATIONS, FROM PONDING ON PREPARED SUBGRADES, AND FROM FLOODING PROJECT SITE & SURROUNDING AREA. PROTECT SUBGRADES AND FOUNDATION SOILS FROM SOFTENING AND DAMAGE BY RAIN OR WATER ACCUMULATION.
  - PLACE BACKFILL AND FILL MATERIALS IN LAYERS NOT MORE THAN 8 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY APPROPRIATE COMPACTION EQUIPMENT AND NOT MORE THAN 4 INCHES IN LOOSE DEPTH FOR MATERIAL COMPACTED BY HAND OPERATED TAMPERS.
  - FILL MATERIALS SHALL BE IMPORTED FROM A MINE OR SITE APPROVED BY THE NCDEQ FOR PROPER EROSION CONTROL.
  - HORIZONTAL CONTROL IS BASED ON NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD83. VERTICAL CONTROL IS BASED ON NAVD83.
  - SURVEY PROVIDED BY THE JOHN R. MCADAMS COMPANY, INC ON 03/26/2024. BEYOND LIMITS OF SURVEY, ELEVATION DATA SHOWN IS BASED ON PUBLICLY AVAILABLE DATA. CONTRACTOR TO FIELD VERIFY ELEVATIONS BEYOND LIMITS OF SURVEY.

- LEGEND**
- ADJACENT PARCEL BOUNDARY
  - PROPOSED SECURITY FENCE
  - EXISTING FENCE
  - PROPOSED ROAD
  - EXISTING TREE LIMITS
  - EXISTING RAILROAD
  - EXISTING OVERHEAD LINE
  - PROPERTY BOUNDARY
  - PROPOSED OVERHEAD ELECTRIC LINES
  - HIGH POWERED OVERHEAD ELECTRIC LINES
  - EXISTING RIGHT-OF-WAY
  - EXISTING FIBER OPTIC CABLE
  - LIMITS OF DISTURBANCE
  - EXISTING TREE LINE
  - PROPOSED PERIMETER WALL
  - PROPOSED VEGETATED SWALE
  - EXISTING MINOR CONTOUR LINES
  - EXISTING MAJOR CONTOUR LINES
  - MINOR CONTOUR LINES
  - MAJOR CONTOUR LINES
  - RIP RAP



**ISSUED FOR PERMITTING**

THE DISTRIBUTION AND USE OF THE NATIVE FORMAT CAD FILE OF THIS DRAWING IS UNCONTROLLED. THE USER SHALL VERIFY TRACEABILITY OF THIS DRAWING TO THE LATEST CONTROLLED VERSION.

Civil 3D 2022 Imperial  
 ANS I D 344-22  
 2/14/2022 4:09 PM

NO	DATE	REVISIONS AND RECORD OF ISSUE	DRN	DES	CHK	PDE	APP
D	24/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
C	25/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
B	12/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	
A	4/SEP/2024	ISSUED FOR 60% REVIEW	CLC	MJM	HGU	SLD	
E	27/SEP/2024	ISSUED FOR PERMITTING	CLC	MJM	HGU	SLD	

**BLACK & VEATCH**  
 Building a world of difference

DESIGNER: MJM DRAWN: CLC  
 CHECKED: HGU DATE: 27/SEP/24

**DUKE ENERGY** DUKE KNIGHTDALE EPC  
 KNIGHTDALE BATTERY ENERGY STORAGE SYSTEM

GRADING AND DRAINAGE PLAN  
 5201 KNIGHTDALE EAGLE ROCK ROAD  
 KNIGHTDALE, NC 27545

PROJECT	DRAWING NUMBER	REV
419596 KND01-CV-C-GR.PL-02		E
CODE		
AREA		